

short wave magazine



FIRST AGAIN!
Icom's IC-R75 Under Scrutiny

JW shares his findings

Limited Space Antenna Solution?
The ALA 1530 Active Loop

More Icom Kit
THE PCR100
Reviewed



PROPAGATION SPECIAL



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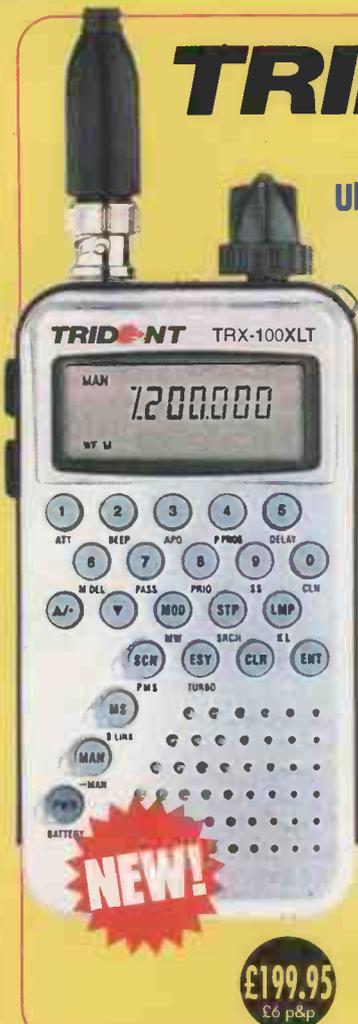
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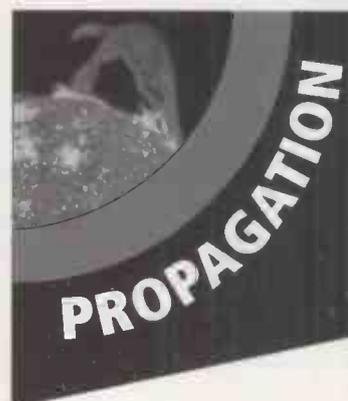
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MAY 1999 Issue

short wave



BROADCAST

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Propagation Special Feature

This month's special feature is brought to you by **Jacques d'Avignon VE3VIA**, our propagation expert. Jacques looks at four important aspects of what, in the final analysis, governs what we can listen to. Also included in this special feature are our regular Propagation Forecasts and Propagation Extra pages.

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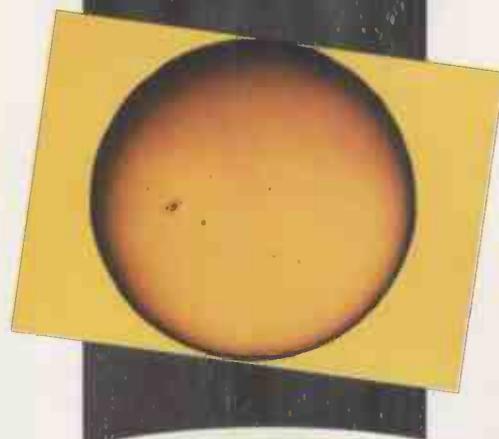
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COVER SUBJECT

Yep, *SWM's* done it again! Icom's brand new IC-R75 in review scoop. Read all about it with John Wilson on page 40.

Don't Forget – you can join the *SWM* Readers' E-mail list by sending a message to swm_readers-on@pwpublishing.ltd.uk

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Having already reviewed its big brother for another publication, **Faris Raouf** gets his mits on the IC-PCR100 computer controlled receiver.



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Did you know that back in 1942, in spite of WWII, amateur radio's first National Field Day took place? **David White G3ZPA** explains all.

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J. Edward Brown brings us more interference tales of Kilocycle Ken and Young Golly.

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John Wilson G3PCY takes a long and expert look at the hot new 'h.f. plus some' receiver from Icom. Read this first UK review in the magazine you can trust.



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Vol. 57 Issue 05 May 1999
ISSN 0037-4261
ON SALE APRIL 22
Next issue on sale May 27

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Components For SWM Projects

In general all components used in constructing SWM projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article. The printed circuit boards for SWM projects are available from the SWM PCB Service. **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 £2.85 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

National Society's Failure

Isn't it sad when organisations lose their way? It's even sadder when they fail in their objectives. Just over a year ago, the RSGB made the brave (or foolish, you judge) step of turning their hand to a business that they clearly don't understand. They purchased a failing magazine that was being turfed out of the Nexus group. This magazine was losing ground fast, with a circulation that was to a level that deemed it uneconomic. The UK's National Radio Society took the decision to become a commercial publisher and acquire the ailing *Ham Radio Today* title for an undisclosed amount - members take note.

This month, having failed to achieve any success with *HRT*, the RSGB have decided to abandon the Amateur Radio audience. They are 're-launching' the publication having renamed it by simply reflecting what they have done. They've dropped the Ham, and now it's called *Radio Today* - cunning eh?

So they are no longer trying to compete with the third in class, they want to clash swords with radio's number one! That's us folks. Wish them luck, they need it.

Balkan Crisis

As ever, when there is conflict on the surface of our blue and green planet, there has recently been an upsurge in radio traffic. It always happens, I guess it always will. Coincident with this upsurge is the opportunist listeners who want to hear something juicy. They ask the same old question, what frequency can I hear the conflict on? Well, the simple answer is just the same frequencies that are in use day in day out by the appropriate agencies, be it broadcast, military or relief. The died in the wool listeners out there will already know what they are. For those not aware and looking for the easy way, take a look at: www.grove-ent.com/hmpgmt.html for added info and enjoyment, you can also get yourself subscribed to the 'Milcom' list.

Oh, and by the way, for those who don't realise, you are extremely unlikely to hear any plain language or 'in the clear' messages that you'll make sense of. It's a war situation. Tactical traffic is sent by **secure** means. Having said that, have fun trying to puzzle things out.

April's CD

Thank you to all those of you who have taken the time to say how good you thought the CD was. Some of your kind words really did make it worthwhile losing all that sleep.

It certainly seems that the vast majority of you feel it was worthwhile. I have had some very favourable comments indeed. I am very pleased that our first attempt was so well received. I am, unfortunately, aware of one or two minor errors which have crept in to spoil things slightly, such as poor spelling (unforgivable - slapped wrist Ed.) and the link to the sounds files from the sounds page for instance, but it seems that no major inconvenience has been experienced by those of you that have commented. Of course the target files are there, and can be hopefully found without too much problem, due to the way in which the directories are named.

We have had some reports of PCs that seem unable to read the disk. This is disappointing, both for me, and of course, those experiencing difficulties. A solution is underway and those effected will have heard from me by now. The difficulty appears to be related to some CD-ROM drives that



are shipped even with the very latest types of machines, even DVD-ROM/CD drives. This is all quite surprising as, during the compliance testing phase of the CD, not a single drive on any machines that were used gave any problems. These ranged from 10 year old single speed units, to 32x drives on 80386, to Pentium III PCs running DOS and all breeds of *Windows*. Macintoshes and UNIX machines were also used, so I had thought we were likely to have a minimum of 'non-workers', and thankfully that's been true.

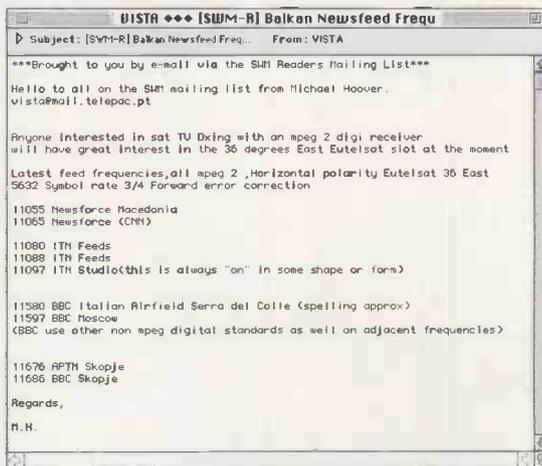
Unfortunately, two of the advertisers 'Web Sites' also suffered a few hitches in the 'mastering' process by way of some broken links. So our apologies to both Javiation and SMC Ltd.

SWM Readers' E-mail List

Our electronic reader forum is steadily growing, with more subscribers daily. It is proving to be a means of some useful exchanges of knowledge and ideas. A recent question posed by one of the participants was, "is it OK to ask v.h.f./u.h.f. related questions?". A short while later the correct response appeared - "yes". The list is there for your convenience, for you to discuss anything radio related, and, as with SWM itself, that means the range is very broad indeed.

For those of you wondering, I've not had much time of late to participate in the list. But, be assured, I am keeping a close eye on how things are going. I'll respond if necessary, you can be sure.

Something that really illustrated the worth of this kind of list is the message below from 'Vista', read it and you'll see what I mean.



Web Site

It has been pointed out to me recently that the SWM Website is out-of-date. Thanks to the informant, you know who you are. I do realise, of course, that we've slipped in keeping things up-to-date. It is very frustrating that, whilst in theory we have access to a medium that can be updated almost in real time, there is currently an external constraint placed on the magazine that means the site has a tiny window in time for updating. Unfortunately this does not fit well into the timing of magazine production. The good news is, though, that shortly things will change, and we'll have the ability to place time sensitive, late-breaking and important news for you, the reader, on the site immediately. This is without doubt the way things should be and I look forward to the enhancement, I'm sure that you will appreciate it too. This will then enable us to feature details like those in the E-mail to the [SWM-R] list mentioned earlier.

Kevin Nice

This month we were inundated with supporting letters, provoked by criticism of SWM's mix of contents...

Dear Sir

With regards to the 'Top QSL' letter published in the March '99 issue, I was interested to read the comments of Mr. Neale, concerning the content and format of *SWM*. From the tone of his letter, I assume Mr. Neale is not a regular subscriber to *SWM*. I base this assumption on the following.

Before me I have the January 1954 issue of *SWM* (yes, I have been both a contributor and subscriber to *SWM* for that long). On the subject of content, maybe Mr. Neale would be interested in the contents of the January 1954 issue of *SWM*. The issue contains 64 pages, of these 22 concern radio, four are about deaf aids, three pages are given over to advertisements for precious scrap metals, 11 pages are dedicated to BBC TV, three pages relate to the new proposed independent TV channels, 15 pages contain advertisements only and the other six pages contain Club News, v.h.f. weather reports and DX commentary. Price 2/-. Content, don't make me laugh, Mr. Neale.

Of course *SWM* has changed. Technological advancement in all things radio related dictates that it must. The *SWM* of today fulfils a never ending thirst for knowledge by those who will carry our wonderful hobby into the next Millennium. As an 'old-timer' I may not be here to see it, but for now I am content to embrace the wonders of E-mail, computers, WXSTATS, and all things related.

In fact, I have just purchased a complete PROSat system, which my son is installing in my radio shack. When asked where he got the knowledge of such a system, his reply was "you can find all you need to know in *SWM*".

So, well done *SWM*, after 50 years on the key, I can now sit back and give my old key a well earned rest, I can also find time to absorb the well written articles contained within the pages of *SWM*. And yes, I do spare a thought for those contributors who sometimes must type late into the night to meet publishing deadlines, in the hope that their articles and first class information will satisfy the readers' never ending demand for knowledge. A big thank you to you all. And yes I do hold a class A callsign, and I do stick QSL cards up in my shack, not so much as to cover up the walls, but to serve as a reminder, in some remote part of the world I have spoken to a fellow radio enthusiast who, like me, is willing to embrace the latest technology.

Would I return to the days of Bendix RA-1B receivers and HRO Junior power packs? Certainly not. Today, if I want to listen to *MIR* then I just switch on my Icom receiver; if I want to transmit to an old friend around the world, I switch on my Kenwood. If I need advice concerning a certain computer program, then I turn to my sons for it. And where did they gain their knowledge of computers and WXSTAT systems? Through the pages of *SWM*, of course.

So you see, Mr. Neale, there is room for all aspects of our wonderful hobby, and there is room for everyone, provided they accept that our hobby has to move forward as technology progresses and as a consequence, *SWM* must move forward to keep pace with such technology.

Mr. Neale asks "What's happened to 'Valve And Vintage'?" Nothing, Mr. Neale. If your interest lies in 'Valve And Vintage' then look no further than *PW*, where you will find a wonderful magazine that is a wealth of information on the subject. And yes, Mr. Neale, I do have an R1155N complete with separate a.c. per/output all in working order, but not for sale. I simply enjoy it for what it is; old, obsolete and out-of-date, a little like you and I, Mr. Neale, but some of us old-timers are still willing to embrace learning (seriously).

Sorry about the long letter, Ed., but I am having trouble getting down from my soapbox!

Peter Davies
North Wales

Dear Sir

Despite some criticisms from some other readers, may I first of all take this opportunity to say what an **excellent** magazine this is and as far as I am concerned, when it comes to covering any topics that are anything to do with radio, *SWM* is the bee's-knees.

I am writing in response to Mr. V. Neale's letter in the March '99 issue. Now, I am not normally one for mincing my words, so I shall just come straight out with it. What a snob he is! Radio is radio, regardless of what mode or form it comes as. The purpose of *SWM* is to cover as many of these modes as possible, through the stages of progress and as is required by demand from the readers.

All modes of radio, whether they be short wave broadcast signals bouncing off the ionosphere, Morse code signals piercing through noise, microwave signals being sent from one hilltop to the next, or satellite signals beamed from the sky, all use the same principle. They have a transmitter at one end and a receiver at the other. All use different modes of transmission and reception and, like everything else in society, all radio signals harness technologies that are both old and new, including computers!

I would also like to point out that those of us in this hobby, whether we be s.w.l.s, radio Hams, DXers et al, all have different interests and we do it for different reasons. I doubt if there are two people in this hobby who have exactly the same interests.

For example, I prefer to **listen** to broadcast stations, whether they be local or DX, whilst others, like some of the contributors to Brian Oddy's column, prefer to simply pick them up and score them off on some kind of log sheet, or correspond with the stations that they hear in return for a much prized QSL card, which would take pride of place in their collections - not the bucket.

As for myself, I may have large antennas and fairly sensitive and selective tuners to pick up as much as I could possibly want, however, I prefer to use my equipment as an extension of my hi-fi system. My Pioneer F502RDS tuner and Lowe HF-225 receiver nestle quite comfortably amongst my CD players, tape decks, satellite boxes, NICAM video recorders, turntables, etc.

Having large antennas enables me to use such equipment to its fullest capability. I can easily choose from almost 70 UK f.m. stations and almost 150 UK m.w. stations, plus whatever is available on satellite, s.w./l.w. and continental m.w. stations. I have all of this because I like to have a greater choice of listening. I quite enjoy listening to County Sound's GOLD service through the night.

Likewise, I also find great joy in listening to other stations, such as Manx Radio, Premier, Heartbeat 1521, Radio 10 Gold, Metro FM, Southern FM and so on. I am in this hobby because I prefer to **listen** to such stations, from the comfort of my own bedroom. Other people prefer to sit in their radio shack, drift along the dial and simply log what they can hear, without paying any great amount of attention to what is actually being broadcast.

Now, I am not a snob. If that's what they want to do, that is their prerogative. If others want to connect a computer to a receiver and try to decode all the beeping noises that are transmitted, they should do so in peace. Likewise, if other people want to scan through the Clarke Belt and see live TV pictures of events, instead of waiting for the edited highlights to appear on a local news bulletin, then let them get on with it.

Mr. Neale is missing the point. He may have his own specific interests, but he should think of it this way: would TV broadcasters abandon their regular showing of soap operas, comedies, movies, sport, news and so on because a Mr. Nerd of Sussex prefers to watch programmes like Mastermind, University Challenge and Open University? I think not. And what would TV be like if, on the approach to the 21st Century, we still had valve sets, with only two or three channels which were only on air at night-time, with test cards in between, and if there was no such thing as teletext, or NICAM, satellite, cable, etc. Oh! What a thought.

May *SWM* continue in its role of catering for all things to do with radio.

Arthur Grainger
Lanarkshire

Dear Sir

I would like to have my say regarding Mr V. Neale's letter in *SWM* March '99. I have read letters like this before in the magazine and I find them very tiring. If the magazine only contained short wave related subjects it would still include 'Airband', Marine, Numbers Stations, Data Modes, Amateur and Broadcast stations. All of these can be found on short wave.

As for my own interests, well, I started with v.h.f. Airband and started buying *SWM* in February 1996, purely for the 'Airband' column. I did however read it from cover to cover, and soon found my interest in other modes growing. Because of this, I now enjoy Weather Satellites, Marine, MilAir and almost all aspects of short wave listening. I have also had a go at DXTV, although not with good results!

My point is that, without *SWM*, I would not have branched out into other areas of the hobby. When I started getting *SWM* I was only interested in the 'Airband' column, now I'm interested in about 90% of the magazine. Rightly, I understand that although I myself haven't got much interest in Satellite TV, for example, other readers may have. Indeed, they may be interested in 'Airband', which is my main interest.

I think you have got the balance right; the magazine must try to cater for all aspects of radio. The only thing I think *SWM* did wrong was to scrap the 'Scanning' column, now rightly rectified. Maybe if Mr Neale doesn't like the magazine he will stop buying it, I for one will not!

Andrew Green
Barnsley

PS. Thanks for mentioning the Scheveningen farewell; I had a listen on the Saturday. At least I got it in my logbook before it went for good.

Well, what can I say? To all of you that wrote in complimenting our editorial content, thank you. Mr Neale, don't be disheartened, it's not personal, and I believe that there really must be something covered within our pages that you enjoy, or you wouldn't be reading the magazine at all! Our aim is to cover a wide range of topics that our readers find interesting, and to keep up with changes in the world at large. Long may we do so. - Ed.

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

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

TOP
QSL

Your News

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



Two Courses

The SWM Newsdesk has recently heard from **Ray Oliver G3NDS**, who informs us of two short courses which will be run at the Newbury College.

The first is an **Electronic Construction for Radio Amateurs and Hobbyists**. This is a short, eight week, beginners course, to assist amateurs or others who wish to construct their own electronic projects. Course starts **Thursday 13th May, 1930 till 2100**.

The other course is **Morse Code For Amateurs**. This is a short, seven week course for those wishing to learn Morse code and pass the current 12w.p.m. RSGB test, or to prepare for the new 5w.p.m. licences. A friendly group environment with tutor support to help you. Course starts **Tuesday 11 May, 1900 until 2030**.

For further details on both the above courses, contact the **Newbury College** on **(01635) 37000**.

Compact Airband Scanner

Nevada are pleased to announce the release of the AR108 - a palm sized scanner covering 108 to 180MHz. Small enough to fit in a top pocket, it is ideal for both airport and airshow use. As a dedicated v.h.f. radio, the AR108 scanning receiver has been optimised to give powerful long distance reception of the v.h.f. and civil airbands.

Features include: powerful receive performance, airband and weather band scanning, 99 memory channels, selective channel switch, dual channel switch, key lock, battery voltage indicator with four grade steps and low battery warning, beep tone on/off and power saving.

A Class Of Its Own

The IC-R75 - Icom's new dedicated h.f. + 50MHz all mode unit combines the latest receiver technology with a range of new features to ease operation and improve reception and signal quality, all for £699. With frequency coverage stretching from 30kHz to 60MHz and true multi-mode reception, the IC-R75 is in a performance class of its own.

Twin Pass Band Tuning (PBT) filters help to assure the highest quality reception at all times by narrowing the i.f. passband in two stages and effectively eliminating any unwanted signals or interference. The IC-R75 is extremely sensitive and able to locate even the weakest signals.

Icom have also included a synchronous a.m. detection circuit to prevent audio distortion while receiving a.m. broadcasts and to give flexible passband width selection, additional i.f. filters can be added to both the 9MHz and 455kHz stages, whilst an a.f. digital signal processing (d.s.p.) unit can also be installed, enhancing performance further.

Features of the IC-R75 also include several speed-selectable scan functions, program scan will search within a specified frequency range, memory

The set is priced at just £69.95 and is sure to be popular with airband enthusiasts. Contact Nevada direct at **189 London Road, North End, Portsmouth PO2 9AE, Tel: (01705) 698113, FAX: (01705) 690626** for more details.

New Service

Martin Lynch & Sons inform us that they now have a new service available to all visitors of their web site. A Message Board system has been installed on the site, enabling visitors to 'post' messages regarding amateur radio related topics. Once a message has been posted, visitors can view a listing of topics, together with the poster's name and the date the information was sent.

The service is entirely free and to date visitors have put messages up on the ML&S Message Board ranging from wanted towers, to discussions on 2m s.s.b. operation. The ML&S web site can be found at **www.mlands.co.uk**

Open Day

Waters & Stanton PLC will hold their 9th and largest Open Day on **30th May**, at their store and in the car park at **Spa House, 22 Main Road, Hockley, Essex** from 1000 until 1600. As their many previous visitors will know, they erect a huge marquee behind their store and use the opportunity to clear many products, ex-service department equipment and general junk at ridiculously low prices.

In the last year, they have extensively altered their warehouse and mail order department, so a huge number of items will be up for grabs! In addition, branded equipment from Icom, Yaesu, Kenwood, Alinco and Watson will be on offer at specially low prices.

Mark Francis will hold his popular auction and promises us the best yet. Most Waters & Stanton staff will also be there for the day and customers will have the chance to put faces to names. Of course, free refreshments will be provided as usual. Don't miss it - **put the date in your diary now!**

Sophisticated System

When proprietors Ian Bowers and John Foster chose the name Alpha, they were probably thinking of the phonetic alphabet so often used by radio operators - A for Alpha, B for Bravo and C for Charlie - but now everything is set to change.

Using miniature computerised screens in their vehicles that spell out jobs clearly and precisely to their drivers, **Alpha Cars** is the first Taxi company in Basingstoke to install the highly acclaimed Cabmaster Software and Datax mobile data terminals supplied by Diplomat UK Ltd. of Basingstoke.

The system is very sophisticated and enables the drivers to interrogate the



system and find out where jobs are and log onto the areas that have most work. The system tracks the location of all the vehicles and ensures they get another job close to their drop off point to avoid unnecessary dead mileage.

Another useful feature is that by using the BT incoming caller ID, the booking office can identify the pick up area before the telephone is answered and further speed up the booking of calls. This same facility enables the drivers of the taxi to initiate a telephone call from their cab to tell their customers they are only a few minutes away and are about to pull up outside their house.

A new facility will now enable regular customers to telephone the special autobook number and have the computer automatically dispatch a car without any human intervention. The computer cleverly has a list of addresses matched to 'phone numbers, so as soon as you ring the autobook line, it knows your address and sends the nearest cab immediately.

Alpha Cars can be contacted on **(01256) 844444**.

scan detects activity on memory channels, priority scan monitors a single priority channel, whilst simultaneously scanning for signals on memory channels.

Despite this comprehensive range of features, the IC-R75 is extremely compact, measuring only 241 (w) x 94 (h) x 229mm (d). This gives complete installation flexibility, however, you choose to operate either as a base or mobile.

Remaining uncluttered, the user-friendly front panel is dominated by the large, clear alphanumeric l.c.d., showing the frequency or channel name in large clear characters. The front panel also offers a numeric keypad to allow direct and accurate frequency entry or memory channel selection.

For users who wish to control their equipment from a PC, an optional software control package is available. This offers access to all the IC-R75's functions and also allows



simple memory editing.

Dale Blackman, Marketing Manager for Icom (UK) Ltd. said "This superb receiver is designed to suit a range of market sectors from the demanding data mode expert to the interested s.w.l. The IC-R75 incorporates Icom's leading edge technology and

offers a range of features that make it exceptional in many ways. I am certain it will set a new standard for performance and value, becoming a popular choice among s.w.l.s everywhere."

To find out about the many other features of this remarkable receiver, contact **Icom (UK) Ltd.** direct at **Sea Street, Herne Bay,**

Kent CT6 8LD, Tel: (01227) 741741, FAX: (01227) 741742. See page 40 of this issue for JW's review! - Ed.

New Catalogue

Now available is the new 1999 Catalogue of products from **Aerial Techniques**, available for just £1.50. If you would like a copy, order via post from Aerial Techniques at **11 Kent Road, Parkstone, Poole, Dorset BH12 2EH**, or by telephoning on **(01202) 738232**, together with credit card details.

Plymouth ARS

From the first Thursday in June 1999, the **Plymouth Radio Society** will meet at the Smeaton Building, University of Plymouth at Drake Circus. Meetings are held twice monthly on the first and third Thursday of each month. (Note that one month in each quarter has a fifth Thursday, there are no club meetings then).

Membership to the club is currently £9 per year, with a £2 joining fee. There is ample free parking at this venue. Club meetings commence at 1930 for a 2000 start, usually ending around 2200.

The City & Guilds Radio Amateur Examination (RAE) Class is held for an hour every Thursday from 1830 until 1930. Usually, there are Morse code tuition classes held at the same time as the RAE class each week.

Anyone is welcome to visit the club, or go to any club evening to meet the members and find out what goes on. Enquiries for the RAE class to **Bob Griffiths** on Plymouth **343177**.

New TRX-100XLT

The new Trident TRX-100XLT ultra wideband scanner from Nevada continuously covers 100kHz to 2200MHz, receiving n.f.m., w.f.m. and a.m. modes. It is packed with facilities, including a 9-channel bandscope display that enables monitoring of adjacent channels in manual,

search and memory scan mode.

A built-in decoder allows reception of audio inverted scrambled transmissions. Using optional software and a control cable, it is possible to link the TRX-100XLT to a computer for monitoring and control. Other facilities include a 10dB attenuator, turbo scan, auto power off and cloning.

The TRX-100XLT will sell for £199, and will be available from **Nevada, 189 London Road, North End, Portsmouth PO2 9AE, Tel: (01705) 698113, FAX: (01705) 690626.**



Anniversary Weekend

Morse test teams will again be on the air during the 13th anniversary weekend of the 8-9th May. For ease of identification, all stations will use a special event GB0 prefix, followed by a county or city suffix; e.g. Norfolk will use GB0NOR and London GB0LDN. The Chief Morse Examiner will use **GB0CW** and the Deputy Chief Morse Examiner **GB0MTS**. Activity will be concentrated in the 80 and 40m amateur bands.

There will be 30 different stations active and a Morse Test Service 13th anniversary certificate will be available to any amateur who makes contact with at least 10 of the GB stations. The certificate will be of similar design to the previous awards in order to form a matching set, with a green and gold border this year.

The cost is £2.50 (cheque or postal order made out to the RSGB), \$5 or six IRCs. Applications with log extracts only should be sent to the **Chief Morse Examiner (Award), RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE**. QSL cards are not required to claim the award, which is also available to listeners.

Send your news to **Zoë Shortland** at the Editorial Offices

Anniversary Award

As part of the 40th anniversary celebrations of **BARTG**, they are pleased to announce the BARTG PSK31 award. BARTG's Chairman, **Arthur Bard G1XKZ**, proudly said "In our 40th anniversary year, it is extremely pleasing to launch an award which looks to the future of ham radio data comms. Promoting new forms of ham radio data comms was the reason why BARTG was first formed and I am sure that BARTG's founders will be pleased to see that, 40 years on, BARTG is still at the forefront of ham radio data comms.

"As far as we know, this BARTG award is the first ever award, world-wide, for the newest data comms mode in ham radio - PSK31. This mode, developed by **Peter Martinez G3PLX**, really is growing in popularity day by day as more and more countries are to be found on the mode."

The rules are very simple. You have to contact 40 different countries world-wide using only PSK31 as the mode. This award is open to s.w.l.s who have heard at least 40 different countries on PSK31. (Why 40 countries? To tie in with BARTG's 40th anniversary of course!).

No crossband or crossmode QSOs are allowed, but any amateur radio band may be used. There are no single-band endorsements. All claims for this award must include a list of verified QSLs (which must state that PSK31 was the mode used) confirmed by two other amateurs.

The award costs £6 or \$10US or 30 IRCs. Applications, with verified QSL list and the fee, should be sent to: **Nigel Roberts G4KZZ, BARTG Awards Manager, 13 Rosemoor Close, Hunmanby, North Yorkshire YO14 0NB.**

BARTG is also on the web at www.bartg.demon.co.uk

Local Radio Group Wins Licence

The **South London Community Radio Group** has been awarded a licence by the Radio Authority to broadcast at the end of this year. The station - to be identified as solo.net - will be on air from Boxing Day and into the year 2000.

Project Manager **Alan Fossey** told us "the purpose of the broadcast is for people in South London to celebrate the new Millennium and we invite everyone to take part in it, 100% involvement by the community is our goal."

The station solo.net say it's thanks to a gift from Barclays Bank that they were able to afford the licence application fee by the deadline last October. But the Group now needs to raise £12000 to pay for the broadcast and is keen to hear from local businesses willing to sponsor the station. Alan Fossey added "it's going to be a lot of hard work getting it all together in less than 300 days, but it will be great fun and, on the night itself, one hell of a party!"

The group wants to hear from anyone interested in going on-air. You can contact solo.net on **0181-401 1895** or pick up a leaflet in your library.



Weather Software From Timestep



PROsat for Windows i is the latest and most powerful APT/WEFAX weather satellite reception Interface and software available from weather satellite equipment manufacturers, Timestep. The 'i' products are new versions of Timestep's popular Windows Interface and 32-bit software and contain every conceivable feature to provide totally stunning live images.

The new 'i' Interface, which connects to the computer serial port and can be used with a notebook or desktop, can take up to three different receivers. All switching is computer controlled and system monitoring and status is shown by 11 l.e.d.s on the front panel.

The 'i' software retains all the features of earlier Windows versions but now also includes:

- * MultiSpectral Colour NOAA APT images
- * Cubic Interpolation for smoother display at higher zoom levels
- * Zoom in and out while receiving
- * Quick 'Auto Limits' contrast setting
- * Multiple windows for the same image (e.g. to view NOAA IR/visible simultaneously)
- * Continuous Polar AutoSave with Auto Schedule to receive all passes with no user intervention
- * Colour animation

Dave Cawley, of Timestep, says "We have been designing weather satellite systems since 1984 and this latest software exploits APT imagery to a level previously unthought of."

The new **PROsat for Windows Interfaces** and 'i' software are priced from £120; 'i' software upgrades for existing Timestep **PROsat for Windows** users start at about £50.

For more information on all Timestep weather satellite equipment and current prices, write to **Timestep at PO Box 2001, Newmarket, CB8 8XB; phone: +44 (01440) 820040; FAX: +44 (01440) 820181**, visit their web site at <http://www.time-step.com> or send an E-mail to sales@time-step.com

Special Edition

The Newsdesk has recently heard from **Mark Thirkettle** of **MGT Publishing**, with news of their new one-off special edition entitled **Cleared to Contact**. This handy guide contains over 20000 words of text, dedicated to monitoring AAR ops from the UK. Also, Vol 2/Issue 1 of **Military Air Scan Network News** (MASNN), their quarterly milair journal, is now available.

MASNN 99 (Vol 2/Issues 1-4) is priced at £12.99, with **Cleared to Contact** available at £4.99. However, if you order both, you can have them for £16.48 (a combined saving of £1.50). Contact MGT Publishing at **PO Box 564, Norwich, NR7 8DD** for more details.



Bangor's Events

The **Bangor & District Amateur Radio Society** hold their monthly club night in the Clandeboye Lodge Hotel. On Wednesday 7th April at 2000 there is a talk on p.s.u.s and a constructor's contest. On Wednesday 5th May there is a talk on RAYNET - Past & Present, and don't forget that June 20th is Bangor's Annual Radio & Computer Rally, also held at the Clandeboye Lodge Hotel. Doors open between noon and 1600, with disabled access from 1130. There will be a bar and full catering facilities available, free parking too. Admission is £2 and there will be a talk-in on Ch. 22.

More information from **Roy GI0WVN** on **(01247) 460716**.

Radio & TVDX News

The French MOD have awarded Marconi's a contract worth two and a half million pounds to provide a maritime h.f. radio system for transmitting data and voice world-wide from 10kW on-shore transmitters. The digital transmitter network will be installed in both France and her remaining dependencies around the globe.

It seems the UK's terrestrial TV analogue network will remain *in situ* until at least 2012 following a recent transmission contract from ITV/Channel 4 to NTL. The contract provides for terrestrial transmission across the network, including microwave linking, though there are 'out clauses' lest the UK government opts for an earlier analogue closedown. It's thought that both NTL and ITV are sure that the analogue transmissions will remain on air until 2012 in view of the specific date in the contract.

The UK's **Six News** 50MHz amateur radio group latest bulletin includes a report that the Spanish TVE-1 main Madrid 250kW transmitter on ch.E2 (48.25MHz) will close at end 1999. This, together with the closure of most Band 1 transmitters in Hungary, is not good news for terrestrial TVDXers!

The Isle of Wight TV-12 transmitter at Rowridge ch.E54 1kW e.r.p. has been given permission to increase its power to 2kW in efforts to improve reception quality on the Island. New TV-12 relays are being opened at Ventnor, Brading, Shanklin and Ryde, talks continue for an extra relay in West Wight. In expansion plans it's been revealed that TV-12 are likely to receive permission for a transmitter in West Sussex, at Chichester.

The Carphone Warehouse have recently bought the Tandy chain of shops leading to a bargain bonanza with scanners and receivers vastly reduced to clear stocks. For example, the DX-934 h.f. receiver selling for up to £199 previously, were being cleared at £49!

Australia has started terrestrial digital TV tests from the Channel 7 Melbourne transmitter (HSV-7), starting February 10th last at 0900 local on ch.A6 174-181MHz, in parallel to the parent programme on ch.A7 and inviting reports of interference. February 24th and the digital tests were taken off-air following expressed concerns by the Epworth Hospital over possible interference to heart monitors.

A report aired on GTV-9 claimed that Channel 7 hadn't started tests but this was disputed and TVDXer **Robert Copeman** confirmed the Channel 6 digital was on-air and his VTV-6 Ballarat, Victoria reception had been wiped out with digital transmission interference! The interference looks like white noise on picture. For anoraks the Channel 6 digital transmission parameters are - 64QUAM/COFDM at 2/3 FEC, 21400 SR.

Icom's New Mobile

The latest mobile from Icom, the IC-2800H, is claimed to be set to revolutionise the radio amateur dual-band market by combining advanced features, unparalleled value, say Icom, and a truly unique design. This outstanding v.h.f./u.h.f. f.m. transceiver introduces a totally new concept in mobile radio design. Not only is the control head permanently separated from the main unit, but the IC-2800H is also the first mobile amateur radio to incorporate a 75mm full colour I.c.d. display.

This unique I.c.d. is capable of presenting operating data in a variety of formats and displaying video from an external source. The control head measures 140mm wide, 70mm high and only 34mm deep, giving maximum installation flexibility, whilst the main unit can be securely fitted out of sight under a seat or behind a panel.

The IC-2800H incorporates twin receivers and, being designed for radio amateurs to use safely on the move, each band has a tuning dial, separate a.f. level and squelch control and four function buttons. For added reliability and to help keep the equipment cool during high and full duty operation, the one piece radio chassis is constructed from die-cast aluminium.

The IC-2800H also has two accessory terminals as standard, allowing direct connection to an external PAL video course and a 9600bps packet modem. The video socket gives the IC-2800H many additional applications, and it may be used in conjunction with a video camera, TV tuner or car navigation system, etc.

Offering exceptional r.f. performance, the IC-2800H



is equipped with switchable 2nd i.f. filtering for high quality narrow band operation. Hear the difference!

In addition to six programmable scans, each band has 99 standard memory channels, five log and five repeater memories and a call channel (all with alphanumeric tags) coupled with various scanning modes. For simple memory management, the IC-2800H has a unique memory edit mode that allows the individual attributes of a memory channel to be modified (frequency, tuning step, etc.). PC cloning software is also available for added convenience and flexibility.

Other features include: broad band receive, tone squelch (CTCSS) with altering beep and tone scan, adjustable squelch attenuator and programmable squelch delay, simple bandscope display with up to $\pm 500\text{kHz}$ spread, 50W r.f. power on 2m, 35W r.f. power on 70cm, advanced HM-98 remote control microphone supplied as standard, SET mode to customise operation and settings, 3.5m (11.5ft) separation cable, eight selectable tuning steps.

Priced at **£549.99**, Dale Blackman, Marketing Manager for Icom (UK) Ltd., believes it is excellent value for money and will become a highly sought after radio.

AirNav 3.0 Now Available

Recently reviewed aircraft tracking software *AirNav* has been updated to version 3.0. This is now available for download at <http://www.airnavsystems.com> *AirNav* is the most powerful resource for the aviation and airband enthusiast. The downloaded version functions as the registered version, but it is also locked to 30 minutes use each session, and there is a 30 day evaluation period. When you register, you will receive your unlock codes, via E-mail, within three hours.

Features of *AirNav 3.0* include:

- ACARS, h.f. and v.h.f. tracking and monitoring
- Internet semi realtime tracking
- Compatible with all ACARS decoders
- Supports DDE (Dynamic Data Exchange) and FWD (File Write Detection)
- Multi-window and vertical tracking
- All heard aircraft management
- Electronic flight progress strips
- Mercator and Azimuthal charts
- Up to 2000 flights simultaneously
- Up to 50 waypoints/flight
- Accurate estimation of times and waypoints
- Professional interface
- Terminal and flight management modes
- 32-bit application
- Nine updated databases with more than 100000 records
- Seven different map creation methods
- Airspace related data drawing
- New online Help, ACARS Quick View, standby flights

Compatible with all the current available ACARS decoders (commercial, shareware and freeware), *AirNav* provides the most of ACARS messages received - and all in realtime! Each message received is completely checked and interpreted in order to give you detailed information on its contents. With more than 30 pre-defined message types and semi-intelligent routines, *AirNav* displays the information you need at realtime.

Shown in realtime are: aircraft type, company, type of message, last heard date, if you have already listened to the aircraft on h.f., or if you have seen it, and much more. Probably the most important and innovative feature is the flight tracking of aircrafts, giving position information using ACARS. You not only listen to them, but also see them!

It is also possible to receive ACARS realtime data from more than one decoder simultaneously, which makes possible the monitoring of more than one ACARS frequency at the same time. *AirNav* is the first programme to provide this feature.

AirNav can also receive updated flight data from the Internet. With just one click of the mouse, you will be able to download updated data for more than 300 flights each hour. Usually more than 300 flights are received each hour!

For more information, go to: <http://www.airnavsystems.com/orde.html>

April 24: A Marconi Birthday Exhibition will be held at the National Wireless Museum, on the Isle of Wight. Open from 1100 until 1700 with free entry and parking. More details from **Douglas G3KPO** on (01983) 567665.

May 3: The Dartmoor Radio Rally is to be held at Pannier Market, Tavistock, Devon. This new location has much more space for traders and visitors, with access for disabled too. There is plenty of free public car parking within five minutes walking distance. There will be trade stands, Bring & Buy, and refreshments, etc. Doors open 1030, with a talk-in on S22. There are beautiful views over Dartmoor, ideal for picnics, so why not take the family? **Ron G7LLG** on (01822) 852586.

May 3: An Amateur Radio & Computer Rally will be held at the Civic Hall, Winsford, Cheshire. May Day Bank Holiday Monday. Doors open 1100, 1030 for disabled visitors and admission is just £1. There will be a large Bring & Buy stall, full catering with bar service, ample parking and talk in on 2m/70cm. General enquiries to **Ted Bannister**, Mid Cheshire Amateur Radio Society, on (01606) 592207 or **David Bevan** on (01606) 77787, E-mail: g0rba@tbannister.freeserve.co.uk

May 9: The Drayton Manor Radio & Computer Rally is to be held at Drayton Manor Park, Fazeley, Tamworth. Staffs on the A4091. The main traders will be in four marquees, with a large outside trader's flea market. There will also be a Bring & Buy stall, local clubs and special interest stands. Open from 1000 onwards. Trader information from **Norman** on 0121-422 9787, other information from **Peter G6DRN** on 0121-443 1189 evenings please.

If you're travelling a long distance to a rally, it could be worth 'phoning the contact number to check all is well, before setting off. The Editorial Staff of *SWM* cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers. If you have any queries about a particular event, please contact the organisers direct. Editor.

rallies

Attention Please!

Would you like to have your Rally publicised? If so, all you have to do is put together as much information as possible about the Rally, i.e. date, location, times, who to contact, etc. and send it to the Editorial Offices.

May 16: The Ripon & DARS are pleased to announce that the Northern Mobile Rally will take place at the Great Yorkshire Showground. There will be all the usual stalls, talk-in, Bring & Buy, free car park, disabled access, etc. Details on (01765) 640229 or E-mail: gerald@bronco.co.uk

May 16: The Mid Ulster Amateur Radio Club Rally will be held at the Silverwood Hotel, Lurgan, Co. Armagh. Doors open to the public from 1200. Traders will have access from 0900. **Jim Lappin**

G10ND on (01762) 851179.

May 16: The Dunstable Downs Radio Club will hold their 16th Annual National Radio Car Boot Sale at Stockwood Country Park, Luton, Bedfordshire. Doors open 0900 till 1500. Talk-in on S22. For a booking form to be sent, please write to **DDRC, PO Box 4053, Dunstable, Beds LU5 5ZJ** enclosing an s.a.e., FAX enquiries to (01525) 383898 or E-mail: ddrc@magstripe.demon.co.uk

May 23: The Three Counties Radio & Computer Rally is to take place at the Perdiswell Leisure Centre, Billford Road, Worcester. Full restaurant services from 0700, licensed bar from 1100. All traders in two adjoining halls, easy access to the halls (ground level) and convenient parking for traders. There will also be free parking for 900 cars and coaches. Being close to the City Centre, wives and children can spend a pleasant day in historic Worcester sightseeing and shopping, etc. **William E. Cotton G4PQZ** on (01905) 773181, for FAX please ring first.



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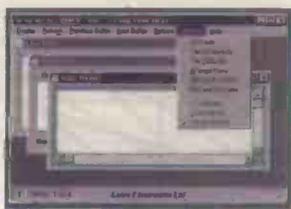
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Bandscan America

RA36 - Radio Nacional Archangel San Gabriel, Argentina's short wave station at their scientific post at Base Esperanza in Antarctica, has returned to the air with a ten fold increase in power. The old 1kW transmitter has been retired to standby use and a new 10kW unit is now in service using 15.475 (6.030 and 11.955 are also registered for use). Initial tests were well and widely heard but, unfortunately, the regular schedule has the station closing well ahead of when they were heard in their test phase and the reception under the regular schedule is likely to be a lot tougher, at least in North America. The normal schedule will run only from 1800 to 2100, Monday through Friday.

In the meantime, some of Argentina's domestic broadcasters continue to be heard sporadically on short wave - relayed for the benefit of Argentines stationed in the Antarctic. Medium wave station Radio Mitre is noted quite frequently and, on occasion, f.m. outlet Radio Nostalgie have been noted at various times on 15.820, lower sideband. Also heard on this frequency at times are Radio Rivadavia and Feeling FM.

Brazilian stations noted during the early part of the year include those listed below:

Super Radio Tupi, Sao Paulo	3.325
Radio Educacao Rural, Tefe	3.385
Radio Rural, Santarem	4.765
Radio Cultura Ondas Tropicais, Manaus	4.845
Radio Verdes Florestas, Cruzeiro do Sul	4.865
Radio Relogio, Rio de Janeiro	4.905
Emisora Rural, Petrolina	4.945
Radio Cultura, Campos	4.956
Radio Mundial, Sao Paulo	4.975
Radio Cultura, Foz de Iguacu	6.105
Radio Record, Sao Paulo	6.150
Radio Record, Sao Paulo	9.505
Radio Marumby, Florinapolis	9.665
Radio Nacional, Brasilia	9.745
Radio Nova Visao, Santa Maria	11.705
Radio Gauba, Puerto Alegre	11.785
Radio Gaucha, Puerto Alegre	11.915
Radio Bandeirantes, Sao Paulo	11.925

In Chile, the still moderately new Voz Cristiana is in full voice, operating on a number of frequencies including 6.070, 9.635, 11.690, 11.745, 15.375, 17.680 and 21.550. Some monitors report poor modulation at times, as well as a problem with spurs. By now the station may have increased its schedule to 24 hours per day.

Colombian activity of late includes:

Ondas del Orteguzaza, Florencia	4.975
Ecos del Atrato, Quibdo	5.020
Caracol Colombia, Bogota	5.077 (absent at times)

The former Radio Internacional in Honduras on 4.930 has a new owner and is now called Radio Costena, with the address **Apartado Postal 3476, San Pedro Sula**. They sign on the air around 1200 (often a few minutes past that hour) and run as late as 0500, carrying a religious format in Spanish. The station also uses the slogan Ebenezer 1220, La Voz de la Palabra.

Recent activity from Ecuador has included:

Radio Luz y Vida, San Luis	3.250
La Voz del Napo, Tena	3.280
Radio Centro, Ambato	3.290
La Voz del Chinchipe	3.5687
Radio Centinela del Sur, Loja	4.770
Radio Oriental, Tena	4.782
Radio Buen Pastor, Saraguro	4.814
La Voz de Saquisilli	4.890
Radio Quito	4.919
Radio Baha'l, Otavalo	4.950

New in Peru is Radio Panorama in Lucmapampa in Cajamarca province (you'll probably need a quite detailed map to find it). Radio Panorama is

operating on 5.9068, variable and signs on around 1010. Another new one is Radio Manantial on 5.7737, believed to be coming from Jaen in Cajamarca province. Sign-on is sometime after 1000. Peru is easily the most 'radio active' country in Latin America; on short wave, anyway. New stations are always coming on the air, old ones going off or changing their name and/or location or frequency.

One other recent Peruvian change involves Radio Satellite, 6.7255, which has opened a parallel on 4.780 - already a high traffic spot. Radio Satellite, located in Santa Cruz has, over time, been the most stable and reliably heard of the dozens of Peruvians operating on odd-ball channels.

If you have picked up the US Armed Forces Radio broadcast relays - specifically the 6.4585MHz frequency - it turns out that you've heard Puerto Rico. The transmitter on that frequency is located at a US Navy base at Isabella (the transmitter using 12.6895 is at a US Navy installation in Key West, Florida). Sad to say, though, these transmissions are doomed, on short wave. The high frequencies are being used to relay AFRTS programs to Navy ships and posts only until direct reception via satellite can be put in place, and it seems that's not very far off. Once the new delivery system is in operation the short wave relays will be dropped. Incidentally, since then, the Navy, however temporarily, has made Puerto Rico active as a short wave broadcasting site. The North American Shortwave Association's Country List Committee has added Puerto Rico to the NASWA Country List. The NASWA list is used by many DXers around the world.

Radio UNAM - XEYU, 9.600 has been reactivated from Mexico City, although so far, the engineers there haven't quite got all the pieces together. The broadcasts are relays of the station's local programming - mostly classical music and other cultural features, all in Spanish. Sign on seems to be around 1400, with sign off at 0700. Reception reports go to: **Technical Department, Adolfo Prieto 133, Colonia del Valle, 03100 Mexico 12 DF, Mexico.**

'UNAM' is the Spanish acronym for Autonomous University of Mexico. The US government's new short wave station is now on the air from the island of Tinian, in the Northern Marianas. There are three 500kW transmitters at the new facility, carrying the programming of the Voice Of America and Radio Free Asia. The initial schedule (which may or may not still be fully in effect) is: 0800 to 1000 on 1.995 and 13.650 with VOA in English; 1000-1100, same frequencies, with VOA in Chinese; 1100-1200 9.860 and 13.790 with Radio Free Asia in Lao; 1200 to 1300 on 11.825 with VOA in Chinese and 13.790 with Radio Free Asia in Khmer; 1300 to 1400 on 11.825 and 15.250 with VOA in Chinese; 1400 to 1500 on 15.260 with Radio Free Asia in Cantonese and 15.470 with RFA in Vietnamese; 1500 to 1600 on 13.735 with RFA in Mandarin and 15.215 with RFA in Burmese; 1600 to 1700 on 1.850 with RFA in Mandarin; 1600 to 1900 on 13.735 with RFA in Mandarin; 1800 to 2000 on 11.790 with RFA in Mandarin and 1900 to 2000 on 11.740 with RFA in Mandarin.

Radio Havana Cuba has started using 11.705 in upper sideband mode for broadcasts to Europe in English and French between 2000 - 2200 (also to North America from 0100 - 0500). The power on this frequency is 30kW. Radio Miskut seems to be the only consistently active short wave station in Nicaragua. It increased power sometime ago, and may by now also have finished revamping its antenna system as well, since it is often well heard, running to 0100 or later on 5.770. Broadcasts are in upper sideband. Replies from this station are a bit 'iffy', but certainly far from impossible. The address is: **Barrio Pancasan, Puerto Cabezas, R.A.A.N., Nicaragua.**

The US Federal Communications Commission's agents located and shut down some 260 pirate broadcasters operating on f.m. or short wave during 1998. Nonetheless, pirate broadcasting remains at a quite active level, with 6.955 still the most likely spot for such appearances.

The growing solar activity has kept the higher frequency bands awake much later into the night-time hours during this winter than was the case last year. While many areas of the upper dial may not have been exactly dancing the jitterbug at 0400 (2300 Eastern Standard Time) and beyond, there was usually at least some activity. Radio Nacional Angola (11.955) was often noted well into the evening, for instance, where a year or two ago the 25m band would have been in virtual hibernation at that hour. A quick check shows that, in the midst of winter, such countries as Tajikistan, Chile, South Africa, Ascension, Tahiti, Philippines, Argentina, Uruguay, Brazil, Thailand, Portugal, Iran, Australia and a number of others were being heard in the late evening to early morning hours over the course of the winter season.



Part of the building of Radio Bandeirantes, Sao Paulo, Brazil, which operates on 6.090 (10kW), 9.645 (7.5kW) and 11.925 (10kW), in addition to medium wave and f.m.



Part of the antenna system of Radio Bandeirantes.

That's that for this time. Please join us in three months for another roundup of short wave reception and activity in the Americas.

Until then, good listening!

NOTE: In most cases the frequencies quoted in this column can be considered slightly variable, particularly in the case of the smaller stations in Latin America.

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

LM&S



The monthly propagation forecast charts prepared by **Jaques d'Avignon** for *SWM* will provide short wave listeners with a valuable guide as we climb the steep slope leading to the peak of the present sunspot cycle. The maximum usable frequencies for circuits to London from the areas covered by the charts are likely to continue to rise in the months ahead, so more use of the **21MHz** (13m) and **25MHz** (11m) broadcast bands can be expected soon.

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 February.

A broadcast from Novosibirsk, Siberia on **270kHz** was picked up at 0100UTC on February 2 by **Ernie Strong** in Ramsey (Cams). The 150kW transmission rated SINPO 22342. It was the first time that Ernie had really studied this band at night and he was surprised by the conditions, which were vastly different from those he had imagined.

Inspired by a report from **John Slater** (Scalloway, Shetland) [LM&S, February'99], **Sheila Hughes** (Morden) tried listening after dawn instead of around midnight for the broadcasts from Rikisutvarpid [National Broadcasting Service, Iceland] on **189kHz**. At 0540UTC on the 10th she received the 300kW transmission from Gufuskalar, W.Iceland, which rated 22222. Sheila says "I am now curious to know what the SINPO might be in the middle of the night - around 0300 perhaps!"

Medium Wave Reports

The listeners in the UK who searched the band at night for broadcasts from m.w. stations in E.Canada and E.USA must have been very disappointed by the unfavourable conditions which prevailed during most nights in February. Frequent checks were made by **David Edwardson** (Wallsend) but any

that he received were too weak to be identified except on the 11th, when he logged WNRB in Boston, MA on **1510kHz** as SINPO 25552 at 0535UTC and WQEW in New York, NY on 1560 as 24542.

Commenting on the conditions, **Eric Duncan** (St.Andrews) says "I have been a regular nightly listener since 1974 and this winter has been the worst for reception from USA/Canada that I can remember. Scrutiny of the A-indices provide an explanation of the conditions experienced. Seldom have we had a value below 10. My experience has been that reception has been even worse than the A-indices would suggest".

However, the listeners who searched the band at night for the broadcasts from m.w. stations in the Middle East, Africa, Europe and Scandinavia had more success - see chart. The sky waves from Santah, Egypt on **864kHz** (500kW) were picked up during the late evening of the 24th by **Adam Birchenhall** in Manchester. By 2300 reception was good, rating 43334.

Whilst searching the band during the afternoon of the 5th **Brian Keyte** clearly heard at 1650 the ident 'Magic AM' on **1548kHz**, which is used by

their outlet in Sheffield. The co-channel outlet in Liverpool uses the 'Magic 1548' ident. He is wondering if the local news from R.CIwyd via Wrexham on **657kHz** has ceased because that outlet now appears to carry only the main BBC R.Wales programmes which include some local news for listeners in NE.Wales. Clarification by a listener/reader in that area would be appreciated.

Short Wave Reports

Although the propagation conditions in the **25MHz (11m)** band may be favourable to a number of areas during the day, the only broadcaster known to be exploiting them at present is R.Budapest. How well their transmission on **25.700** (Hung to Australia 1100-1200) is being received 'down under' is unknown here. It was heard faintly at 1100 by **Philip Rambaut** in Macclesfield; noted as 'very weak' by **Bernard Curtis** in Stalbridge; rated 34433 at 1100 by **Vic Prier** in Colyton; 45344 at 1100 by **Eddie McKeown** in Newry; 15322 at 1120 by **Simon Hockenhill** in E.Bristol; 45544 at 1140 by **Ross Lockley** in Galashiels.

There is no shortage of broadcasters in the **21MHz (13m)** band! During the morning UAER, Dubai **21.700** (Eng to Far East 0530-0600) was rated 33553 at 0538 by **John Parry** in Larnaca, Cyprus; R.Australia via Shepparton **21.725** (Eng to Pacific areas 0600?-0858) 25332 at 0745 in E.Bristol; UAER, Dubai **21.605** (Ar to Eur 0615-1030) 44333 at 0940 in Colyton; RAI Rome **21.520** (It to Africa 0600-1300) 45554 at 1000 in Wallsend; R.Prague, Czech Rep **21.745** (Eng to Asia 1000-1030) 34343 at 1002 by **Tony Hall** in Freshwater Bay, IoW; Voice of Turkey **21.715** (Tur to W.Asia, Australia 0600?-1100?) 44444 at 1015 in Stalbridge; R.Austria Int, Moosbrunn **21.765** (Eng, Ger to Far East, Pacific 0800-1100) 35444 at 1027 by **Darren Beasley** in Bridgwater; RFI via Issoudun? **21.580** (Fr to S.Africa 0900-1600) 34333 at 1120 by **Rhoderick Illman** in Oxted.

After mid-day, Voz Christiana, Chile **21.500** (Sp to N.America 1100-?) was rated 44444 at 1205 by **David Hall** in Morpeth; R.Ukraine Int **21.510** (Eng to Australia 1200-1300) 34323 at 1221 by **Vera Brindley** in Woodhall Spa; HCJB Quito, Ecuador **21.455** (Eng [u.s.b. + p.c.] to N.S.America 1200-1600) 34433 at 1233 by **Martin Goodey** in St.Mary's, Isles of Scilly; REE via Noblejas **21.700** (Sp to S.America 1200-1800) 34333 at 1320 by **Robert Hughes** in Liverpool; Channel Africa via Meyerton, S.Africa **21.530** (Eng to Africa 1300-1455? Sat/Sun) 44444 at 1426 by **Martin Vønner** in St.Austell; R.Sweden, Stockholm **21.810** (Eng to N/C.America 1430-1500) 44444 at 1445 by **Stan Evans** in Herstmonceux; BBC via Cyprus **21.470** (Eng to Africa 1400-1700) 55444 at 1400 by **Ernest Wiles** while in Limassol, Cyprus & 24212 at 1420 in Newry; R.Portugal Int via Sines **21.655** (Port to Brazil 0800?-2230?) 34443 at 1540 by **Robert Connolly** in Kilkeel; WYFR via Okeechobee, USA **21.525** (Eng, Fr, Port to Eur, Africa 1600-2000) 45544 at 1609 by **Fred Wilmshurst** in Northampton; BBC via Ascension Is **21.660** (Eng to Africa 1100-1700) SIO 233 at 1647 by **John Eaton** in Woking.

The narrow **18MHz (15m)** band is allocated for s.s.b. broadcasting in the future, but it is being used just now by two broadcasters with a.m. transmissions. During part of the day, R.Norway Int is active on **18.950**. At 1300 they beam towards N.America (Norw 1300-1330) - rated 34553 at 1320 in Larnaca, Cyprus. The other occupant is Christian Science Broadcasting in Boston, USA. Their transmission from Cypress Creek on **18.910** (Fr, Eng to E/C.Africa 1600-1900?) was rated SIO 333 at 1645 in Macclesfield.

Broadcasts from several continents may be received in the **17MHz (16m)** band. During the morning R.Australia via Shepparton **17.750** (Eng to Asia 0600-0900) was 34433 at 0748 in St.Mary's, IoS; R.Pakistan, Islamabad **17.835** (Ur [Cricket] to Eur 0800-1100) 43333 at 0915 in Stalbridge; R.Austria Int via Moosbrunn **17.615** (Eng, Ger to F.East, Pacific 0800-1100) 44444 at 0945 in Colyton; AIR via Bangalore **17.387** (Eng to Pacific

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	H* J*
153	Donebach DLF	Germany	500	A,B,C,D,E*,F,G,H*,I,J*,K
162	Allouis	France	2000	A,B,D,E*,F,G,H*,I,J*,K
171	Nador Medi-1	Morocco	2000	H* J*
171	B'shakovo etc	Russia	1200	B,E*,H*,J,K
171	Sasnovy	Belarus	1000	J*
177	Oranienburg	Germany	500	B,E*,G,I,J*,K
183	Saarlouis	Germany	2000	B,E*,F,G,H*,I,J*,K
189	Gufuskalar	W.Iceland	150	D
189	Tbilisi	Georgia	500	J*
198	Droitwich BBC	UK	500	B,D*,E*,F,G,I,J,K
207	Munich DLF	Germany	500	B,C,E*,F,G,H*,I,J*,K*
207	Azilah	Morocco	800	H* J*
216	Roumoules RMC	S.France	1400	B,C,D,E*,E,G,H*,I,J*,K
216	Ganca	Azerbaijan	500	J*
225	Raszyn Resv	Poland	?	C*,D*,E*,G*,H*,J*,K*
234	Beidweiler	Luxembourg	2000	B,D,E*,F,G,H*,J*,K
234	Ark'gelsk etc	Russia	500	J*
243	Kalundborg	Denmark	300	B,C,D*,E*,G,H*,J*,K
252	Tipaza	Algeria	1500	D*,G*,H*
252	Atlantic 252	Eire	500	B,D*,E*,F,G,H*,I,J*,K
261	Burg(R.Ropal)	Germany	85	C,D*,E*,F,G,H*,J*,K*
261	Taldom Moscow	Russia	2500	J*
270	Topolina	Czech Rep	1500	C*,D,E*,G*,H*,J*,K
270	Novosibirsk	Siberia	150	J*
279	Sasnovy	Belarus	500	D*,E*,J*,K*

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

Listeners:-

- (A) Adam Birchenhall, Manchester.
- (B) Martin Dale, Stockport.
- (C) Simon Hockenhill, E.Bristol.
- (D) Sheila Hughes, Morden.
- (E) Eddie McKeown, Newry.
- (F) Frank Miles, SW London.
- (G) George Millmore, Wootton, IoW.
- (H) Fred Pallant, Storrington.
- (I) Tom Smyth, Co.Fermanagh.
- (J) Ernie Strong, Ramsey, Cams.
- (K) Fred Wilmshurst, Northampton.

areas 1000-1100) 34333 at 1005 in Freshwater Bay, IoW; R.Prague, Czech Rep **17.485** (Eng to W.Africa 1000-1030) 55544 at 1010 in Northampton; R.Pakistan, Islamabad **17.835** (Eng to Eur 1105-1120) 44544 at 1107 in Bridgwater; BBC via Skelton & Woofferton, UK **17.640** (Eng to E.Eur, M.East, E.Africa 0700-1500) 55444 at 1100 in Limassol, Cyprus & 44444 at 1115 by **Martin Cowin** in Kirkby Stephen; DW via Rwanda **17.800** (Eng to Africa 1100-1150) 54444 at 1144 by **Tom Winzor** in Plymouth.

After mid-day R.Bulgaria, Sofia **17.500** (Eng to Eur 1200-1300) was 44444 at 1205 in St.Austell; R.Sweden, Stockholm **17.870** (Eng to N.America 1230-1300) 43433 at 1235 in Herstmonceux; R.Romania Int **17.745** (Eng to Eur 1300-1356) 43333 at 1350 in Morden; Africa No.1, Gabon **17.630** (Fr to W.Africa 0700-1100, 1200-1600) 32232 at 1410 in Liverpool; Israel R, Jerusalem **17.535** (Eng to Eur, N.America 1500-1530) 55555 at 1500 by **Clare Pinder** in Appleby; BBC via Antigua, W.Indies **17.840** (Eng to C/N.America 1400-1700) SIO 333 at 1540 in Macclesfield; DW via Rwanda? **17.800** (Eng to Africa 1600-1650) SIO 444 at 1600 by **Tom Smyth** in Co.Fermanagh; BBC via Ascension Is **17.830** (Eng to W/C.Africa 0730-2100) 33333 at 1605 in Kilkeel; Channel Africa via Meyerton **17.860** (Eng to W.Africa 1700-1730) 45454 at 1702 in Newry; VOA via Morocco **17.895** (Eng to Africa 1600-1900) 44554 at 1710 in Woking; WHRI via Maine, USA **17.655** (Eng to M.East, Africa 1800-2000) 44444 at 1809 in Woodhall Spa; VOA via Greenville, USA **17.725** (Eng to Africa 2000-2200) 45554 at 2042 by **Fred Pallant** in Storrington; HCJB Quito, Ecuador **17.795** (Ger to Eur 2100-2130) 44333 at 2101 in Oxted; RCI via Sackville **17.820** (Fr, Eng to Eur, Africa 2000-2200) 25332 at 2125 in E.Bristol.

There is also much to interest the listener in the **15MHz (19m)** band. In the morning R.Kuwait via Sulabiyah **15.110** (Eng to SE.Asia 0500-0800) rated 55555 at 0530 in Limassol, Cyprus; R.Africa 2, Eq.Guinea **15.185** (Eng to Africa 0700-1100) 33333 at 0735 in St.Mary's, IoS; BBC via Ascension Is **15.400** (Eng to Africa 0800-1130) 44444 at 0800 in Morden; R.Australia via Shepparton **15.415** (Eng to Asia 0100-0400, 0600-0900) 44333 at 0815 in Herstmonceux; KTWR Guam **15.330** (Eng to Asia 0800-0930) 44344 at 0825 in Woodhall Spa; R.Australia via Shepparton **15.510** (Eng to Pacific 0200-0900) 34533 at 0845 in Wallsend; Voice of Armenia, Yerevan **15.270** (Eng to Eur 1000-1030 Sun) 54444 at 1021 in Freshwater Bay, IoW; Voice of Nigeria via Ikorodu **15.120** (Eng to W.Africa 0500?-1100) 34433 at 1030 in Galashiels; R.Bulgaria, Sofia **15.700** (Ger, Eng to Eur 1100-1300) 55545 at 1105 in Kirkby Stephen; Israel R, Jerusalem **15.640** (Eng to Eur, N.America 1130-1135) 55544 at 1122 in Northampton.

During the afternoon the Voice of Greece, Athens **15.630** (Eng to Eur, N.America 1240-1250) was 45444 at 1241 in Bridgwater; VOIRI Tehran, Iran **15.084** (Home Sce relay) 55555 at 1250 in Liverpool; Swiss R.Int via Sottens **15.185** (Eng, Ger, Fr, It to C/S.Asia 1400-1615) 32333 at 1400 in Appleby; RCI via Sines, Portugal **15.325** (Eng to Eur, M.East, Africa 1430-1500) 55545 at 1435 in E.Bristol; WEWN via Vandiver, USA **15.745** (Eng to Eur 1000-2200) 33343 at 1500? by **Robert Shacklock** in Westwood, Notts; KTWR Agana, Guam **15.330** (Eng to S.Asia 1500-1630?) 33333 at 1545 in Morpeth; Africa No.1, Gabon **15.475** (Fr to W.Africa 1600-1900) 34443 at 1625 in Kilkeel; Voice of Nigeria via Ikorodu **15.120** (Eng to Africa, Eur 1600-1700?) 45444 at 1639 in Storrington.

In the evening VOA via Botswana? **15.445** (Eng to Africa 1600-1800) was 54444 at 1703 in Plymouth; BBC via Ascension Is **15.400** (Eng to Africa 1500-2300) 55555 at 1706 in Woking; R.Norway Int. **15.705** (Norw to Eur, N.America 1700-1730) SIO 444 at 1715 in Macclesfield; R.Romania Int **15.365** (Eng to Eur 1730-1756) 45544 at 1730 in Colyton; LJB [V of Africa], Libya **15.415** (Ar [Home Svc relay]) 34333 at 1744 in Newry; WYFR via Okeechobee **15.695** (Eng to Eur, Africa 1600-1900) 33323 at 1840 in Stalbridge; VOA via Greenville, USA **15.580** (Eng to Africa 1800-2200) 44444 at 1928 in St.Austell; RNB Brazil **15.265** (Eng, Ger to Eur 1800-2050) 44333 at 2011 in Oxted.

The occupants of the **13MHz (22m)** band now include R.Austria Int via Moosbrunn **13.730** (Eng to Eur 0830-0900), rated SIO 444 at 0852 by **Francis Hearne** in N.Bristol; SRI via Sottens **13.685** (Eng, It, Ger, Fr to Australasia 0830-1030) 43333 at 0935 in Stalbridge; UAER, Dubai **13.675** (Eng to Eur 1030-1055) 35433 at 1036 in Bridgwater; R.Vlaanderen Int,

Belgium **13.745** (Eng to Eur?, N.America? 1130-1200) 44444 at 1141 in St.Austell; Austria Int via Moosbrunn **13.730** (Ger, Eng to Eur, N.America 1200-1300) 55555 at 1246 in Plymouth; BBC via Skelton, UK **13.660** (Ar to N.Africa 1200-1800) 44434 at 1247 in Oxted; UAER, Dubai **13.675** (Eng to Eur 1330-1355) 54444 at 1330 in Morden; R.Sweden **13.740** (Eng to Pacific, Asia 1430-1500) 55555 at 1450 in Herstmonceux; WWCR Nashville, USA **13.845** (Eng to Africa 1400-0000) 22322 at 1600 in Liverpool; Croatian R, Zargreb **13.830** (Cr, Eng to N.America 1230-2100) 44444 at 1625 in Kilkeel; AIR via Bangalore **13.720** (Hin to E.Africa 1615-1730) SIO 222 at 1705 in Macclesfield; VOA via Selebi-Phikwe, Botswana **13.710** (Eng to Africa 1600-2130?) 45544 at 1835 in Northampton; AIR via Bangalore **13.780** (Eng to NW.Africa 1745-1945) 32343 at 1925 in Colyton; R.Havana Cuba **13.720** (Eng to Eur 2030-2130) 34533 at 2115 in St.Mary's, IoS; RCI via Sackville, Canada **13.650** (Fr, Eng to Eur, Africa 2000-2200) SIO 243 at 2153 in Woking; also **13.690** (Fr, Eng to Eur, Africa 2000-2300) 35333 at 2136 in E.Bristol; R.Vlaanderen Int, Belgium **13.670** (Eng to N.America 2230-2256) 45323 at 2230 in Newry.

Broadcasts from many areas may be received in the **11MHz (25m)** band during the day. Noted before noon were VOA via Sao Tome **11.805** (Eng to Africa 0600-0630), rated 33333 at 0610 in Morden; FEBC Boucau, Philippines **11.635**



Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener	Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
1251	C.G Amber,Bury StEg.		0.76	B,D,G,L	1260	Brunel CG, Bristol		1.60	C*
1260	R.Solway	B	2.00	B	1260	Marcher G, Wrexham		0.64	D
1260	Capital G,Litt'brne		0.10	F,G,H,I,L,M	1260	SabrasSnd,Leicester		0.29	A,D,G*,L,M
603	R.Bedfordshire(3CR)	B	0.20	A,D,G,H,I,L,M	1260	R.York	B	0.50	B
630	R.Cornwall	B	2.00	B,G,I	1278	Cl.Gold 1278 W.York		0.43	D,K*
657	R.Clywd	B	2.00	B,I,L	1296	Radio XL,Birmingham		5.00	A,D,G,I,K*,L,M
657	R.Cornwall	B	0.50	B	1305	Magic AM,Barnsley		0.15	B,D
666	Westward R, Exeter		0.34	E,F,G,I,L,M	1305	Premier via ?		0.50	G,I,L,M
666	R.York	B	0.80	B,D,F,G,L	1323	Capital G,Southwick		0.50	F*,G,I
729	BBC Essex	B	0.20	D,G,K*,L,M	1323	SomersetSnd,Bristol	B	0.63	B,G
738	Hereford/Worcester	B	0.037	D,E,F,G,L,M	1332	Premier, Battersea		1.00	A*,G,I,K*
756	R.Cumbria	B	1.00	A,B,G	1332	Cl.Gold 1332,Pi'bo		0.60	A,B,D,G,L,M
756	The Magic 756,Powys		0.63	D,G,I,L,M	1332	Wiltshire Sound	B	0.30	I
765	BBC Essex	B	0.50	A,D,G,I,L,M	1359	The Breeze,Chelms'd		0.29	G
774	R.Kent	B	0.70	F,G,I,L,M	1359	Cl.Gold 1359, C'try		0.27	A,D,G,L,M
774	R.Leeds	B	0.50	A,B,D,G	1359	R.Soleil	B	0.85	G,I,L
774	Cl.Gold 774, Glos		0.14	B,D,G	1368	R.Lincolnshire	B	2.00	G,L,M
792	Cl.Gold 792,Bedford		0.27	G,L,M	1368	Southern Counties R	B	0.50	G,I
801	R.Devon & Dorset	B	2.00	B,E,G,I,K,L	1368	Wiltshire Sound	B	0.10	G,I
828	Cl.Gold 828, Luton		0.20	G,L,M	1377	Asian Sd, Rochdale		0.10	D,G*
828	Magic 828, Leeds		0.12	D	1413	R.Gloucester via ?	B	?	L,M
828	Asian Netwk Sedgley	B	0.20	D	1413	Premier via ?		0.50	G,I,L
828	2CR CG, Bournemouth		0.27	I	1413	Yks Dales R,Skipton		0.10	B,D
828	Townland R, Ulster		0.80	B	1431	The Breeze,Southend		0.35	A*,G,L
837	R.Cumbria/Furness	B	1.50	B	1431	Cl.Gold, Reading		0.14	G,I,L,M
837	Asian Netwk Leics	B	0.45	D,G,I,L,M	1449	R.Peterboro/Camb's	B	0.15	B,D,G,L,M
855	R.Devon & Dorset	B	1.00	B,C,I,N	1458	R.Cumbria	B	0.50	B
855	R.Lancashire	B	1.50	B,D	1458	R.Devon & Dorset	B	2.00	B,I
855	R.Norfolk, Postwick	B	1.50	F,G,L	1458	1458 Lite AM Manch'		5.00	D
855	Sunshine 855,Ludlow		0.15	A,C,D,E,F,G,M	1458	Sunrise, London		50.00	A*,G,I,L,M
873	R.Norfolk, W.Lynn	B	0.30	A*,D*,F,G,I,L,M	1458	Asian Netwk Langley	B	5.00	G,L,M
936	Brunel CG, W.Wilts		0.18	F,G,I,L,M	1476	CountySnd,Guildford		0.50	G,I,K,L,M
936	Yks Dales R, Hawes		1.00	B,D,G,J*	1485	Cl.Gold, Newbury		1.00	E,F*,G,L,M
945	Cl.Gold GEM, Derby		0.20	A,B,D,L,M	1485	R.Humberside (Hull)	B	1.00	I
945	Capital G, Bexhill		0.75	G,I	1485	R.Merseyside	B	1.20	B,E,F*,G,I
954	Westward R, Torquay		0.32	F,G,I	1485	Southern Counties R	B	1.00	G,I
954	Cl.Gold 954, H'ford		0.16	D,E,G,L,M	1503	R.Stoke-on-Trent	B	1.00	B,D,G,I*,L,M
963	Asian Sd, E.Lancs		0.80	B,D	1521	Heartbeat 1521AM,Nl		0.50	B,K
963	Liberty R, Hackney		1.00	A*,G,I,L,M	1521	Fame 1521, Reigate		0.64	G,I,L,M
972	Liberty R, Southall		1.00	A,D,E,G,L,M	1530	R.Essex, Southend	B	0.15	G,L
980	R.Devon, E.Devon	B	1.00	B,E,G,I	1530	Cl.Gold W.Yorks		0.74	B,D,G,L
980	Magic AM,Doncaster		0.25	D,I	1530	Cl.Gold Worcester		0.52	G,M
990	Cl.G, Wolverhampton		0.09	D,G,M	1548	R.Bristol	B	5.00	G,I
999	C.Gold GEM Nott'ham		0.25	D,G,L,M	1548	Capital G, London		97.50	G,I,L
999	Red Rose 9-99 P'stn		0.80	B,D	1548	Magic AM,Merseyside		4.40	B,G
999	R.Soleil	B	1.00	F,G,I	1548	Cl.Gold, Sheffield		0.74	K*
1017	Cl.G, Shrewsbury		0.70	B,D,E,G,L,M	1557	R.Lancashire	B	0.25	B,D,F*
1026	R.Cambridgeshire	B	0.50	D,E,G,L,M	1557	Cl.Gold 1557,N.hant		0.76	A*,G,K*,L,M
1026	Downtown R, Belfast		1.70	B,K	1557	Capital G, So'ton		0.50	G,I
1026	R.Jersey	B	1.00	E,G,I	1584	London Turkish R		0.20	G,L
1035	RTL Country 1035		1.00	I,G,L,M	1584	R.Nottingham	B	1.00	D
1035	R.Sheffield	B	1.00	D,G*,L	1584	R.Shropshire	B	0.50	B,G,I
1035	N.Sound 2, Aberdeen		0.78	B,G	1584	Tay, Perth		0.21	G,K
1116	R.Derby	B	1.20	A,B,D*,G,K*,L,M	1602	R.Kent	B	0.25	F,G,I,L
1116	R.Guernsey	B	0.50	G,I					
1116	Valley R, Ebbw Vale		0.50	E					
1152	Cl.G Amber, Norwich		0.83	L					
1152	LBC A2 AM		23.50	G,I,L,M					
1152	Pic'ly A2,Manch'r		1.50	B,D					
1152	Xtra-AM,Birmingham		3.00	A*,E					
1161	R.Bedfordshire(3CR)	B	0.10	G,L,M					
1161	Brunel Cl.G,Swindon		0.16	B,F,G					
1161	Magic AM,Humberside		0.35	D,G*					
1161	Southern Counties R	B	1.00	G,I					
1161	Tay AM, Dundee		1.40	G,I					
1170	Cl.G Amber, Ipswich		0.28	L					
1170	GNR, Stockton		0.32	B					
1170	Capital G,Portsm'th		0.50	F*,G,I					
1170	Signal 2,Stoke-on-T		0.20	D					
1170	Swansea Snd,Swansea		0.58	F*					
1170	1170AM,High Wycombe		0.25	G,L,M					
1242	Capital G,Maidstone		0.32	F,G,I					

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

Listeners:-

- (A) Adam Birchenall, Manchester.
- (B) Robert Connolly, Kilkeel.
- (C) Bernard Curtis, Stalbridge.
- (D) Martin Dale, Stockport.
- (E) Simon Hockenfull, E.Bristol.
- (F) Sheila Hughes, Morden.
- (G) Brian Keyte, Bookham.
- (H) Frank Miles, SW London.
- (I) George Millmore, Wootton, IoW.
- (J) Clare Pinder, while in Appleby.
- (K) Tom Smyth, Co.Fermanagh.
- (L) Ernie Strong, Ramsey, Cambs.
- (M) Fred Wilmshurst, Northampton.
- (N) Tom Winzor, Plymouth.



(Eng to Asia 0930-1100) 35333 at 0932 in Northampton; R.Australia via Shepparton **11.880** (Eng to Asia 0900-1100) 32222 at 1015 in Stalbridge; BBC via Kranji, Singapore **11.765** (Eng to Asia 0900-1100) 34232 at 1027 in Oxted; BBC via Skelton & Woofferton, UK **12.095** (Eng to Eur, N/W.Africa 0600-2000) 45544 at 1040 in Kirkby Stephen & 44444 at 1600 in Limassol, Cyprus; R.Prague, Czech Rep **11.640** (Eng to N.Eur 1130-1157) 44434 at 1144 in Freshwater Bay, IoW.

During the afternoon R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1100-1730) was rated 33333 at 1241 by **Martin Dale** in Stockport; R.Japan via Sri Lanka **11.880** (Eng to S.Asia 1400-1500) 33553 at 1420 in Larnaca, Cyprus; RCI via Sines **11.915** (Eng, Fr to Eur, Africa 1430-1600) 35433 at 1410 in E.Bristol; ERT Tunisia **11.730** (Nat prog 0600-1710) 54444 at 1535 in Liverpool; AIR via Bangalore **11.585** (Farsi to Iran

1615-1730) SIO 333 at 1615 in Macclesfield; R.Australia via Shepparton **11.660** (Eng to Asia 1330-1700) 54444 at 1630 in Morpeth; VOA via Udon Thani, Thailand **11.920** (Eng to E.Africa 1600-2000) 44433 at 1630 in Kilkeel.

Later, LJB [V of Africa], Libya **11.815** (Ar [Home Svce relay]) was 43343 at 1746 in Newry; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 55544 at 1815 in St.Mary's, IoS; Voice of Greece, Athens **12.105** (Gr, Eng to Africa? 1800-1900?) 43323 at 1843 in St.Austell; Egyptian R, Abis **12.050** (Ar [Home Svce relay] to Eur, N.America 0200-0000) 44434 at 1910 in Colyton; WWCR Nashville, USA **12.160** (Eng to N.America, Eur 1400-2200) 44444 at 1932 in Woodhall Spa; Swiss R.Into via Julich, Germany **11.910** (It, Ar, Eng, Gr, Fr, to Africa 1830-2130) SIO 444 at 2026 in N.Bristol; R.Damascus, Syria **12.085** (Eng to Eur 2005-2105) 44444 at 2041 in Plymouth; DW via Wertachtal

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof/Wurzburg (BR)	Germany	0.2	A*	1188	Kuurne	Belgium	5	F*,H*
526	Vatican R.	Italy	5	K*	1197	Munich(VOA)	Germany	300	F*
531	Ain Beida	Algeria	600/300	H*,K*	1197	Virgin via ?	UK	?	H,J,K,L
531	Torshavn	Faeroe Is.	100	E	1206	Bordeaux	France	100	C
531	Berg	Germany	20	F*,H*	1215	Virgin via ?	UK	?	B,H,J,K,L
531	RNE5 via ?	Spain	?	F*,H*	1224	Lelystad	Holland	50	F*,K*
531	Beromunster	Switzerland	500	H*,K,L	1224	COPE via ?	Spain	?	F*,K*
540	Wavre	Belgium	150/50	B*,F*,G,H,K,L	1233	Liege	Belgium	5	F*,H*
540	Sidi Bennour	Morocco	600	B*,F*,H*,K*	1233	RFE via ?	Czech Rep.	40	F*
549	Les Trembles	Algeria	600	B*,F*,H*,K*	1233	Rhodes via ?	UK	?	J,K*,L
549	Sasnovy	Belarus	1000	K*	1242	Marseille	France	150	A,F*
549	Thunau (DLF)	Germany	200	B*,F*,H*,K*,L	1242	Virgin via ?	UK	?	K*
558	Espos	Finland	100	H*	1251	Marcali	Hungary	500	F*,K*
558	RNE5 via ?	Spain	?	B*,F*	1251	Huisberg	Netherlands	10	H*
567	Tullamore(RTE1)	Ire	500	B,C,E,H,J,K,L	1251	Dubai	UAE	600	H*
567	RNE5 via ?	Spain	?	B*	1260	Rhodes(VOA)	Greece	500	K*
576	Muhlacker(SDR)	Germany	500	B*,F*,K*	1260	SER via ?	Spain	?	F*,H*,K*
576	Riga	Latvia	500	H*,K*	1269	Neumunster(DLF)	Germany	600	B*,F*,H*,K*,L*
576	Barcelona(RNE5)	Spain	50	H*,K*	1269	COPE via ?	Spain	?	K
585	Orf Wien	Austria	600	H*	1278	Cubini(CRTEZ)	Eire	10	B*,C,E*,F*,H*,J,L*
585	Paris(FIP)	France	8	H,K	1287	RFE via ?	Czech Rep.	400	F*,H*,K*,L*
585	Madrid(RNE1)	Spain	200	B*,C*,G*,F*,H*,K,L*	1287	Lerida(SER)	Spain	10	K*
585	Dumfries(BBCScot)	UK	2	F*,J	1296	Valencia(COPE)	Spain	10	H*,K*
594	Frankfurt(HR)	Germany	1000/400	B*,F*,G,H*,K,L	1296	Orfordness(BBC)	UK	500	B*,E,K
594	Oujda-1	Morocco	100	H*,K*	1305	RNE5 via ?	Spain	?	K*
594	Muge	Portugal	100	F*,H*,K*	1314	Kvitsoy	Norway	1200	B*,F*,H*,K*,L
603	Lyon	France	300	A,C,H*	1323	W'brunn (V.Russia)	Germany	1000/150	B*,C,D,E,F,K*,L*
603	Oradea	Roumania	50	H*	1332	Rome	Italy	300	F*,H*,L*
603	Sevilla(RNE5)	Spain	50	C*,F*,K*	1341	Lisnagarvey(BBC)	N.Ireland	100	B*,C,D*,E,H*,J,K*,L
603	Sousse	Tunisia	10	H*	1341	Tarasas(SER)	Spain	2	D*,H*,K*
603	Newcastle(BBC)	UK	2	E,F*,K	1350	Nancy/Joice	France	100	F*,J*
612	Athlone(RTE2)	Ire	100	B,G,E,H*,J,K,L	1350	Cesvaine/Kuldiga	Latvia	50	H*,K*
612	RNE1 via ?	Spain	10	B*	1359	Madrid(RNE-FS)	Spain	600	C*,H*,K*,L*
612	Tallinn	Estonia	100	K*	1368	Foxdale(Manx R)	I.O.M.	20	B*,C,E*,F,H*,K*
621	Wavre	Belgium	80	B*,F*,G,H,K,L	1377	Lille	France	300	A,C,F,H,K,L
621	RNE1 via ?	Spain	10	B*,K	1377	Tanaf	Iraq	1000	K*
621	Barcelona(OCR)	Spain	50	F*,H*	1386	Bolshakovo	Russia	2500	F*,H*,K*,L*
630	Vigra	Norway	100	F*,H*	1395	Filake	Albania	1000	F*,K*
639	Praha(Libice)	Czech	1500	B*,F*,H*,K*	1395	Lopik	Netherlands	120/40	F,H,J,K,L*
639	RNE1 via ?	Spain	?	B*,C*,F*,H*,K*,L*	1404	Brest	France	20	F*,H*,K*,L*
648	RNE1 via ?	Spain	10	B*,F*	1413	Pristina	Spain	?	F*,K*
648	Orfordness(BBC)	UK	500	B*,E*,F*,G,H,K,L	1422	Alger	Yugoslavia	1000	H*,K*
648	Kharkiv	Ukraine	150	K*	1422	Heusweiler(DLF)	Germany	1200/600	B*,F*,H*,J,K,L*
657	Napoli	Italy	120	H*	1440	Marnach(RTL)	Luxembourg	1200	B,D,F*,H,K*,L*
657	Madrid(RNE5)	Spain	20	B*,F*,G,H*,K*	1449	Squinzano	Italy	50	H*
657	Wrexham(BBCWales)	UK	2	B,E,F*,K,L	1449	Redmoss(BBC)	UK	2	F*
666	Messkirch(Rohrd/SWF)	Germany	150	B*,F*,G*	1458	Filake	Albania	500	K*
666	Lisboa	Portugal	135	B*,F*,K*	1467	Monte Carlo(TWR)	Monaco	1000/400	F*,K*,L*
666	Barcelona(SER)	Spain	50	B*	1476	Wien-Bisamberg	Austria	600	K*,L*
675	Lopic(R10 Gold)	Holland	120	B,C,F*,G,H,J,K,L	1485	SER via ?	Spain	?	K*
684	Sevilla(RNE1)	Spain	500	B*,C*,F*,H*,K*	1494	Clermont-Ferrand	France	20	A,F*,H*
684	Avala(Beograd-1)	Yugoslavia	2000	H*,C*	1494	St.Petersburg	Russia	1200	C*,F*,H*,J*,K*,L*
693	Tortosa(RNE1)	Spain	2	F*	1512	Wolvertem	Belgium	300	D*,F,H*,J,K*,L*
693	Droitwich(BBC)	UK	150	B,H,K,L	1521	Kosice(Cizaitice)	Slovakia	600	H*
702	Yerevan	Armenia	10	K*	1521	Busaba	Saudi Arabia	2000	H*,K*
702	Flensburg(NDR)	Germany	5	F*,H*	1521	Kazan (R.Moscow)	Russia	20	K*
702	Monte Carlo	Monaco	40	H*	1530	Vatican R	Italy	150/450	E,F*,H*,K*,L*
702	Zamorat(RNE1)	Spain	10	B*	1539	Mailifingen(ERF)	Germany	350/700	F*,H*,J*,K*,L*
711	Rennes 1	France	300	A,F*,H,K,L	1557	Nice	France	300	A*
711	Laayoune	Morocco	600	H*,K*	1566	Stax	Tunisia	1200	K*
720	Langenberg	Germany	200	K*	1575	Genova	Italy	50	F*,H*,K*
720	Lisnagarvey(BBC4)	N.Ireland	10	H*,J	1575	SER via ?	Spain	5	C*,H*,K*
720	Norte	Portugal	100	B*,F*	1584	SER via ?	Spain	2	C*,K*
720	Lots Rd.Ldn(BBC4)	UK	0.5	B,E,H*,K,L	1593	Holzkirchen(VOA)	Germany	150	F*,H*,K*,L*
729	Cork(RTE1)	Ire	10	E,H*,K*	1602	SER via ?	Spain	?	C*,H*
729	RNE1 via ?	Spain	?	B*,F*,H*,K*,L*	1602	Vitoria(EI)	Spain	10	F*,H*
738	Paris	France	4	D*,F*	1611	Madrid	Italy	15	E,H*,L*
738	Barcelona(RNE1)	Spain	500	B*,C*,H*,K*					
747	Flevo(Hilv2)	Holland	400	B,C,F*,H,K,L					
756	Braunschweig(DLF)	Germany	800/200	B*,F*,H*,K					
756	Bilbao(EI)	Spain	5	B*,K*					
756	Redruth(BBC)	UK	2	E					
765	Sottens	Switzerland	500	B*,F*,H*					
774	Enniskillen(BBC)	N.Ireland	1	F*,J					
774	RNE1 via ?	Spain	?	B*,F*,H*,K*,L*					
783	Leipzig(MDR)	Germany	100	B*,F*,H*					
183	Miramar(R.Porto)	Portugal	100	H*					
783	Dammam	Saudi Arabia	100	H*					
792	Limges	France	300	A,F,H,L*					
792	Lingen(NDR)	Germany	5	H*					
792	Sevilla(SER)	Spain	20	F*,H*					
792	Londonderry(BBC)	UK	1	J					
801	Munchen-Ismaning	Germany	300	B*,F*,H*					
801	RNE1 via ?	Spain	?	B*,F*,H*					
810	Madrid(SER)	Spain	20	B*,H*,K*					
810	Westergien(BBCScot)UK	UK	100	B,E,H*,J,K,L*					
819	Batra	Egypt	450	F*,H*,K*					

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

Listeners:-

- (A) Adam Birchall, Manchester.
- (B) Martin Dale, Stockport.
- (C) Simon Hockenhill, E.Bristol.
- (D) Sheila Hughes, Morden.
- (E) Brian Keyte, Gt Bookham.
- (F) Eddie McKeown, Newry.
- (G) Frank Miles, SW London.
- (H) George Millmore, Wootton IoW.
- (I) Clare Pinder, while in Appleby.
- (J) Tom Smyth, Co.Fermanagh.
- (K) Ernie Strong, Ramsey, Cambs.
- (L) Fred Wilmshurst, Northampton.

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer	Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2049	M	5.010	AIR Thirupuram	India	0110	A,R
2.340	Fujian 1, Fuzhou	China	2159	D	5.020	PBS-Jiangxi Nanchang	China	2339	P
3.200	TV/R Manzini	Swaziland	0304	K	5.020	La Vu du Sahel, Niamey	Niger	2116	A,K,M,P
3.210	REE via Costa Rica	Costa Rica	0135	R	5.025	ABC Katherine	Australia	2131	D,E,M,R
3.215	RRI Manado	Indonesia	0018	C	5.025	R.Rebelde, Habana	Cuba	0135	A,K,L,R
3.255	BBC via Meyerton	S.Africa	0306	F,K	5.035	R.Bangui	C.Africa	0509	K
3.270	Nambian BC, Windhoek	Namibia	1900	A,K,M,D	5.035	Hanoi Hmong Sce	Vietnam	2155	R
3.290	Nambian BC, Windhoek	Namibia	0309	A,F,K	5.040	PBS Fujian, Fuzhou	China	2340	PR
3.300	R Cultural	Guatemala	0310	K	5.040	Voz del Upano, Machos	Ecuador	0137	R
3.315	AIR Bhopal	India	1737	A,J,M,R	5.047	R.Togo, Lome	Togo	2138	A,K,M
3.316	SLBS Goderich	Sierra Leone	2102	A,M	5.050	Haixia 1.V of Strait	China	2139	M
3.320	SABC (RSG) Meyerton	S.Africa	1838	A,P	5.050	R.Tanzania	Tanzania	2002	K,M,O,P
3.335	CBS Taipei	Taiwan	2100	D,M,R	5.055	RFO Cayenne(Matoury)	French Guiana	2155	A,K,M
3.345	AIR Jaipur	India	1727	A,J,M	5.075	Caracol Bogota	Colombia	0327	F,K
3.356	R Botswana	Gaborone	1955	M	5.100	R.Liberia, Torota	Liberia	2035	I,M
3.365	GBC R-2	Ghana	2121	A,M,P	5.163	CPBS 2, Beijing	China	2159	R
3.365	AIR Delhi	India	1757	M	5.240	Xizang, Lhasa	Tibet	0040	R
3.915	BBC via Kranji	Singapore	2100	A,B,C,G,J,K,L,Q,P,R,T	5.320	CNR 1	China	2200	PR
3.930	Nei Menggu-Mo, Hohhot	China	2111	R					
3.955	BBC via Skelton	England	1710	A,C,G,J,K,L,Q,P,R,S,T					
3.960	Xinjiang PBS, Urumqi	China	0055	R					
3.965	RFI Paris	France	2115	I,K,PR,T					
3.970	R Korea via Skelton	England	2035	A					
3.975	R Budapest	Hungary	1905	A,G,I,J,K,N,O,PT					
3.980	BBC via Skelton	UK	2200	A,B,K,L,PR,S,T					
3.985	Nexus, Milan	Italy	1816	I,K,Q					
3.985	China R.Int via SW	Switzerland	2220	A					
3.995	DW via Julich	Germany	1910	A,K,L,O,PR,T					
4.005	Vatican R.	Italy	2200	I,K,L,R,T					
4.035	Xizang PBS, Lhasa	Tibet	0104	R					
4.460	CPBS 1, Beijing	China	2318	I,P					
4.750	Xizang BS, Lhasa	China	2325	A,P					
4.760	AIR Port Blair	India	0038	K,P					
4.765	R.Rural, Santarem	Brazil	0805	F					
4.770	FRCN Kaduna	Nigeria	2115	C,F,K,M,D,T					
4.775	AIR Imphal	India	0100	A					
4.775	TV/R Manzini	Swaziland	0355	K					
4.790	Azad Kashmir R.	Pakistan	1715	I,K,P					
4.800	AIR Hyderabad	India	0035	F,PR					
4.800	LNBS Maseru	Lesotho	0410	K					
4.815	R Difusora, Londrina	Brazil	0025	A					
4.815	R.diff TV Burkina	Duagadougou	0608	K					
4.815	R.Pakistan Karachi	Pakistan	0105	A					
4.820	R.Botswana, Gaborone	Botswana	1915	F,O					
4.820	La Voz Evangelica	Honduras	2320	C					
4.820	AIR Calcutta	India	1814	C,P					
4.820	Xizang, Lhasa	Tibet	2337	C,P					
4.828	ZBC R-4	Zimbabwe	1953	K,M					
4.830	R.Tachira	Venezuela	0340	A,F					
4.832	R.Relej	Costa Rica	0810	F					
4.835	ABC-Alice Springs	Australia	2145	M					
4.835	R.Tezuulutan, Coban	Guatemala	0113	A,R					
4.835	RTM Bamako	Mali	2123	C,H,K,M,O,PR					
4.840	AIR Bombay	India	0015	A,K,M,R					
4.845	RTM Kuala Lumpur	Malaysia	1700	M					
4.850	R.Yaounde	Cameroon	0413	K,O,R					
4.850	CNR 1	China	2325	PR					
4.860	AIR Delhi	India	1815	H,K,M,PR					
4.870	R.Cotonou	Benin	0610	A,K,P					
4.880	R. Difusora Acreana	Brazil	0046	K					
4.885	R.Clube do Para	Brazil	0318	F,K,M,R					
4.885	R.Difusora Acreana	Brazil	0120	A					
4.885	KBC East Sce Nairobi	Kenya	1809	K,M,R					
4.890	RFI Paris	via Gabon	0358	K	(A)	Robert Connolly, Kilkeel.			
4.890	R.Port Moresby	New Guinea	2004	M	(B)	Bernard Curtis, Stalbridge.			
4.895	Voz del Rio Arauca	Colombia	0319	K	(C)	John Eaton, Woking.			
4.900	Haixia 2.V of Strait	China	2319	PR	(D)	David Edwardson, Wallsend.			
4.910	Tennant Creek	Australia	2136	M	(E)	Martin Goodey, St. Mary's, IoS.			
4.915	R.Difusora, Macapa	Brazil	2152	M	(F)	David Hall, Moreth.			
4.915	GBC-1, Accra	Ghana	2128	A,I,K,M,R	(G)	Simon Hockenbill, E.Bristol.			
4.920	R.Quito, Quito	Ecuador	0418	F,K,R	(H)	Robert Hughes, Liverpool.			
4.920	AIR Chennai	India	1725	H,K,M	(I)	Sheila Hughes, Morden.			
4.930	R.Internacional	Honduras	0321	K	(J)	Roderick Illman, Oxted.			
4.940	AIR Guwahati	India	0049	K,M,R	(K)	Eddie McKeown, Newry.			
4.950	AIR Srinagar	India	1743	G,H,M,P	(L)	Frank Miles, SW.London.			
4.950	VOA via Sao Tome	Sao Tome	2050	I,K,M,N,O,PT	(M)	Fred Pallant, Storrington.(N) Clare Pinder, while in Appleby.			
4.955	R.Nac. de Colombia	Colombia	0302	K	(O)	Vic Prier, Colyton.			
4.960	VOA via Sao Tome	Sao Tome	0505	K	(P)	Robert Shacklock, Westwood, Notts.			
4.965	Christian Voice	Zambia	1929	M	(Q)	Tom Smyth, Co.Fermanagh.			
4.975	R.Uganda, Kampala	Uganda	1931	I,K,M	(R)	Eric Strong, Ramsey, Cambs.			
4.980	PBS Xinjiang, Urumqi	China	0050	F,M,R	(S)	Martin Venner, St. Austell.			
4.980	Ecos del Torbes	Venezuela	0303	A,F,H,I,K,PR	(T)	Fred Wilmshurst, Northampton.			
4.985	R.Brazil Central	Brazil	0010	A,F,K,L,M,R,T					
5.010	R.Garoua	Cameroon	2149	K,R					
5.010	Guangxi 2, Nanning	China	0051	K,M,R					

11.865 (Eng to Africa 2100-2150) 35444 at 2121 in Storrington; RCI via Sackville **11.945** (Fr, Eng to Eur, Africa 2000-2300) 43344 at 2241 in Woking.

R.New Zealand's broadcasts to Pacific areas in the **9MHz (31m)** band have been attracting the attention of some listeners in the UK. Their 100kW transmission on **9.700** (Eng 0707-1015) was rated 33222 at 0800 in Appleby, 35553 at 0840 in Wallsend & 44333 at 0940 in Herstmonceux. Also received before noon were Swiss R.Int via Julich, Germany **9.885** (Fr, It, Eng, Ger to Africa 0600-0815) rated 43334 at 0710 in Stalbridge; R.Finland via Pori **9.840** (Eng to SW.Eur 0730-0800) 55544 at 0745 in St. Mary's, IoS; Swiss R.Int via Montsinery, Fr.Guiana **9.885** (Eng, It, Ger, Fr to Australia 0830-1030) 55555 at 0840 in Woodhall Spa; HCJB in Quito, Ecuador on **9.640** (Eng to S.Pacific 0700-1100) 34433 at 0910 in Colyton; R.Nederlands via Bonaire, Ned.Antilles **9.820** (Eng to Pacific 0930-1125) 54444 at 0935 in Kirkby Stephen; R.Mediterranee Int, Morocco 9.575 (Ar, Fr to N.Africa, S.Eur 0500-0100) SIO 444 at 1121 in Oxted; R.Vlaanderen Int, Belgium **9.925** (Eng to Eur, M.East 1130-1200) 55555 at 1158 in Plymouth.

During the afternoon R.Nederlands via Wertachtal **9.855** (Eng to Eur 1130-1325) was 44444 at 1240 in Stockport; R.Tashkent, Uzbekistan **9.715** (Eng to S.Asia 1330-1400) 34323 at 1330 in Newry; Voice of Vietnam, Hanoi **9.840** (Eng to SE.Asia 1330-1400) 44454 at 1355 in Liverpool; RCI via Skelton, UK **9.555** (Eng to Eur, Africa 1430-1500) 44434 at 1445 in Freshwater Bay, IoW; BBC via Kranji Singapore **9.740** (Eng to S.Asia 1600-1800) 44444 at 1645 in Kilkeel.

In the evening AIR via Delhi **9.950** (Eng to Eur 1745-1945) was SIO 222 at 1800 in Co.Fermanagh; R.Thailand, Udon Thani **9.535** (Eng, Ger to Eur 1900-2100) 43343 at 1910 in Westwood, Notts; VOA via Morocco? **9.760** (Eng to Eur, M.East, N.Africa 1700-2200) 44434 at 1920 in St.Austell; REE via Noblejas, Spain **9.680** (Eng to Eur, Africa 2000-2055) 54444 at 2000 in Galashiels; Israel R, Jerusalem **9.435** (Eng to Eur, N.America 2000-2025) 45444 at 2020 in E.Bristol; R.Australia via Shepparton **9.500** (Eng to Asia, Pacific 1600-2130) 24443 at 2030 in Storrington; RCI via ? **9.770** (Eng to Eur, Africa 2100-2200) 55444 at 2124 in Bridgwater; Voice of Armenia, Yerevan **9.965** (Eng to Eur, USA 2115-2145) 45544 at 2125 in Northampton.

Later, P.Rep.China, Beijing **9.080** (Chin [CNR-1] 1100-1735, 2000-0030) was rated 23212 at 2215 by Frank Miles in SW.London; R.Cairo, Egypt **9.990** (Eng to R 2115-2230) 44333 at 2145 in Morden; Voice of Turkey, Ankara **9.655** (Eng to Eur,

N.America 2300-0000) SIO 333 at 2306 in N.Bristol; R.Nac del Paraguay **9.735** (Sp 0800-0400) 54343 at 2312 in Woking; R.Cultura, Sao Paulo, Brazil **9.615** (Port 0800-0300) 23333 at 07?? in Morpeth.

Quite a few of the broadcasts to Europe in the **7MHz (41m)** band were noted in the reports. They included R.Japan via Woofferton, UK **7.230** (Jap, Eng 0500-0700), rated 44433 at 0653 in St.Austell; WYFR via Okeechobee, USA **7.355** (Eng 0600-0800, also to Africa) 45444 at 0740 in St.Mary's, IoS; Christian Science BC via WSHB **7.535** (Various 0400-1000) 54454 at 0855 in Kirkby Stephen; AVWR via Forli, Italy **7.230** (Eng 0930-1000) 55545 at 0930 in SW.London; R.Prague, Czech Rep **7.345** (Ger 1100-1127) 44444 at 1127 in Oxted; RAI Rome **7.120** (Eng 1935-1955) 42333 at 1935 in Appleby; R.Slovakia Int **7.345** (Eng 1930-1957) 54444 at 1940 in Colyton; Voice of the Mediterranean, Malta via Russia **7.440** (Eng 2000-2100) SIO 444 at 2008 in N.Bristol; R.Bulgaria, Sofia **7.535** (Eng 2000-2100) 55545 at 2017 in E.Bristol; Voice of Israel, Jerusalem **7.465** (Eng 2000-2025) 43343 at 2020 in Liverpool; Polish R, Warsaw **7.285** (Eng 2030-2128) 44444 at 2039 in Plymouth; R.Romania Int, Bucharest **7.195** (Eng 2100-2156) 43333 at 2100 in Westwood, Notts; AIR via Bangalore **7.410** (Hi, Eng 1745-2230) 43333 at 2100 in Stalbridge; Voice of Russia **7.300** (Eng [WS]) 55555 at 2112 in Bridgwater; R.Prague, Czech Rep. **7.345** (Eng 2100-2127, also to N.America) 45544 at 2127 in Northampton; RCI via Skelton, UK **7.235** (Fr, Eng 2000-2230) 34333 at 2205 in Woodhall Spa; Voice of Turkey **7.280** (Eng 2300-0000) 33322 at 2347 in Stockport.

Good reception over transatlantic paths has been noted in the **6MHz (49m)** band from WEWN Birmingham, USA **5.825** (Eng to N.America 2200-0500), rated 55544 at 0708 in Kirkby Stephen; WWCR Nashville, USA **5.935** (Eng to USA 0100-1400) 44333 at 0822 in Oxted; DW via Antigua, W.Indies **6.160** (Eng to Asia, Australia 0900-0950) 44444 at 0905 in Morpeth; RCI via Sackville, Canada **5.995** (Eng, Fr 2200-2300) 44434 at 2205 in E.Bristol; R.Taipei via WYFR Okeechobee, USA **5.810** (Eng 2200-2300) 45444 at 2222 in Northampton; WHRI Noblesville, USA **5.755** (Eng to N.America, Eur 2100-0000) 44333 at 2300 in Morden; BBC via Antigua, W.Indies **5.975** (Eng to C/N.America 2100-0800) 44444 at 2344 in St.Austell; BBC via Sackville, Canada **6.175** (Eng to N.America 2200-0500) 33443 at 2351 in Woking; WEWN Birmingham, USA **5.825** (Eng to N.America 2200-0500) SIO 433 at 0100 in Co.Fermanagh; R.Taipei via WYFR **5.950** (Eng to N.America 0200-0300) 44433 at 0204 in Kilkeel.



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"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

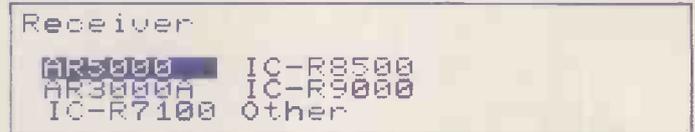
- ✓ Wide frequency coverage 10 kHz - 2600 MHz
- ✓ All mode reception: USB, LSB, CW, AM, Synchronous AM, NFM, WFM with automode tuning (any mode and bandwidth on any frequency is possible)
- ✓ Automatic Frequency Control
- ✓ Noise blanker
- ✓ High stability TCXO reference, 1 Hz NCO tuning
- ✓ 1,000 memories, 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

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

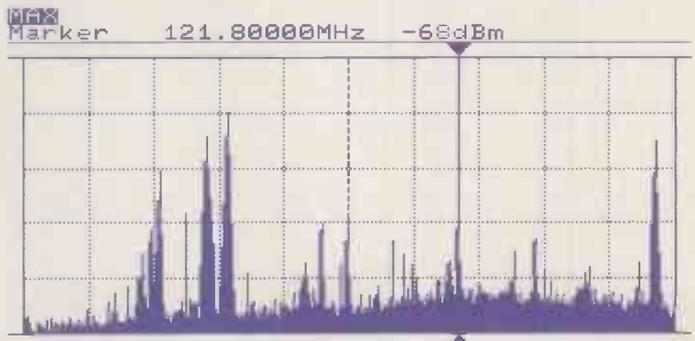
Already pressed into commercial usage by the government, the professionalism of the unit has truly been grasped. The SDU5500 has a high resolution monochrome (white/blue) LCD with improved status read-out on the top-half of the display with a spin wheel tuner controlling the marker position, similar to a dedicated high-priced spectrum analyser.



Compared to its predecessor, new facilities have been provided:

- Step resolution mode, plots the wanted channel steps and ignores the gaps for more efficient analysis.
- Channel step mode, plots the wanted channels for close in use on channelised bands.
- Spectrum mode is of course available with peak, max, average etc.
- On screen support for AOR AR5000/5000+3, AR3000A, ICOM IC-R7100, IC-R8500, IC-R9000 and 'Other' companion radio.

```
CF : 120.50000MHz  SPAN : 7600kHz
RRBW : 30kHz      GAIN : H1
RX : AR5000
FDIR : Reverse   PLOT : Paint
STEP : 25.00kHz  MODE : AM
ATT : OFF        OP.MODE : STRES
```



6 PREV MAX AVR NEXT

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.

SDU5500 £799



in LW - MW - HF - VHF - UHF : Base, Mobile, Hand-portable
 lists for the enthusiast - leading to products which bring **you** more features & facilities.



AR8200
 shown here with the
 optional slot cards



AR8000

AR8200 all mode hand portable receiver 500kHz to 2040MHz. Features the new 8.33kHz airband channel spacing (correctly implemented). Optional slot cards available for CTCSS, External memory etc. Computer port for hands-off control & management (requires optional CCB200 interface lead). **Free supporting software** available from the AOR internet site.
AR8200 £399

AR8000 all mode hand portable receiver 500kHz to 1900MHz. Dot matrix display, a real trendsetter. Computer / reaction tune port and many features.
AR8000 £299

ARD2 portable ACARS & NAVTEX decoder & display unit, can be operated from internal batteries or external d.c. supply. An RS232 port expands capabilities, **free supporting software** from the AOR internet web site.
ARD2 £295



AR7030



AR3000A

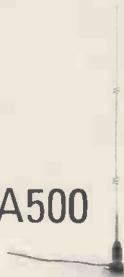
AR7030 High dynamic range, short wave receiver 0 - 32 MHz.
AR7030 PLUS Enhanced version, fitted with narrow AM filter, optical encoder, features CPU with 400 memory channels and alpha-tag, optimised components.
AR7030 £799
AR7030 PLUS £949

The **AR3000A** is evolution at its very best. Wide band all mode receiver, 100kHz to 2036MHz high performance, RS232 port as standard. Respected best seller with over 70,000 sold world-wide. The PLUS version has enhanced facilities.
AR3000A £699
AR3000A PLUS £799



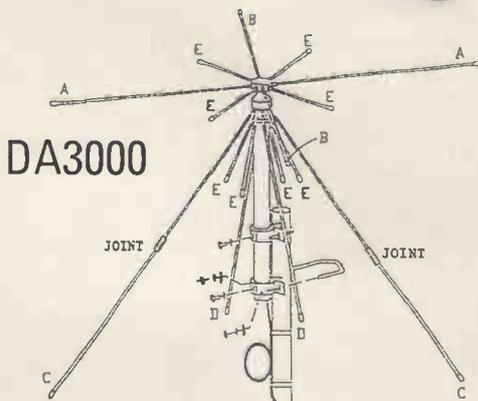
ARD2

MA500



LA320

DA3000 discone aerial 25 to 2000MHz. Supplied with 15m of terminated coax cable, clamps.
DA3000 £89.95 (P&P £5.00)
SA7000 passive wide band two element aerial 30kHz to 2000MHz.
SA7000 £129 (P&P £3.50)
MA500 mobile whip aerial on a magnetic base.
MA500 £64 (P&P 3.50)
LA320 active short wave loop aerial. Supplied with two elements 1.6 - 5MHz & 5 - 15MHz with optional additional elements for medium (320M) & long wave (320L).
LA320 £139 (P&P 3.50)



DA3000

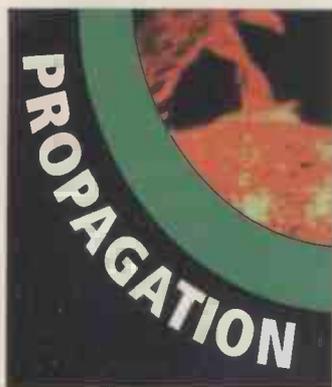
SA7000

Detailed leaflets available upon request

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Diversity Reception

This month's special feature is brought to you by Jacques d'Avignon VE3VIA, our propagation expert. Jacques looks at four important aspects of what, in the final analysis, governs what we can listen to.

The forecasting process itself, like that of weather forecasting, has no guarantees. So what's involved? A network of global beacons allow real time evaluation of path from your QTH. Can diversity help? Is the Ionosphere being modified by man-made radiation?

You are well installed in your favourite chair, getting ready for a good listening session of Radio Buru-Buru. The forecasted conditions, as laid out in *SWM's* propagation pages, have been correct every time you have used them. (No one tells me if my forecasts are accurate, so I will say it myself: they are very accurate! J.d'A.).

The program that you are waiting for starts, but the quality is very poor: the signal keeps fading in and out and it is becoming extremely difficult to listen and understand the news. What is happening, and what can be done to alleviate this situation?

Signal Flutters

First, let's look at what is happening. Simply, the signal being refracted by the ionospheric layers is being refracted from a non-perfect surface, thus the signal flutters as the ionosphere is a dynamic layer and does not remain in a steady state. Because of this movement, more than one signal is reaching your receiver and at times the two or more signals cancel or re-enforce each other.

Due to the construction of our hearing system and of the electronics, we are not as sensitive to an increase in the signal strength as we are of the decrease of the signal. So what you are hearing is the cancellation of the signal reaching you by two or more different paths.

How do you correct this situation? (I am assuming here that this station is not available on the 'Net in RealAudio!'). The solution is called

diversity reception. There are three main types of diversity reception: space, frequency and polarisation diversity.

Many Components

As the signal is broken up in many components, it has been proven that the fading does not occur simultaneously at all points at the same time. Antennas separated by a bare minimum of ten wavelengths will receive two distinct signals from the distant source. So you would want to have a set of antennas separated by ten times the lowest wavelength that you wish to receive.

For example, if you are interested in the tropical band of 4.8MHz, your two antennas would have to be separated by 10 x 60m or 600m. Unless you own a big estate, the chances are slim that this method will be very useful to you. In the early days (1930s) of transatlantic telephone, where h.f. frequency were being used, this method was the one in vogue.

The antennas used were long rhombic antennas aimed very accurately to the transmitter site, the signal from each antenna was fed into a discrete receiver and the audio outputs were combined to give you a very steady output to feed the 'phone line.

Same Signal

Frequency diversity assumes that the station is transmitting the same signal on more than one frequency, which is normally the case for the broadcasters and the larger utility stations. This requires one separate receiver for each frequency,

but the antenna can be the same as long as there is a good antenna splitter to isolate the input of each receiver from each other.

There are two methods to extract a good audio signal from such an arrangement. In one case, the audio signals are fed into an amplifier circuit that checks the level of each signal and sends on the output line the best one.

The other method uses special receivers, where the automatic gain control (a.g.c.) circuits of the receivers are tied together and the receiver receiving the lowest strength signal is automatically muted by a circuit in the receiver receiving the good signal. Eddystone made such receivers, and I have used them commercially for frequency diversity or polarisation diversity operations.

Major Drawback

Frequency diversity reception has a major drawback when used for RTTY or FAX reception: the arrival time of each signal is not the same on all frequencies, so your weather maps or photos are illegible. In the case of RTTY, you run in synchronisation problems and you have a very poor copy unless one frequency remains dominant during the reception period. If this happens, diversity is of

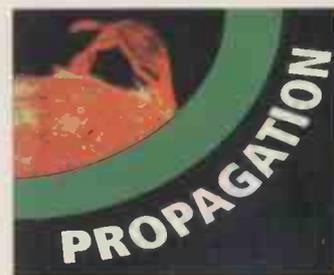
no use on this circuit.

Finally we have polarisation diversity where you use two antennas feeding one or two receivers. It is then possible to use one frequency only and avoid some of the problems described in the case of frequency diversity. Feeding one receiver from two antennas can be done fairly easily, no special equipment is required if you just want to play around and try this system with one receiver.

Many Combinations

There are many combinations of the above method that have been tried and are in still in use today: space and frequency system; frequency and polarisation system, space and polarisation system, etc. If you have large property and many receivers to play around with, by all means go ahead and set yourself up for the next broadcast of Buru-Buru.

For the ordinary listeners, we would recommend to experiment with polarisation diversity and one receiver. When using more than one receiver, the equipment has to be the same and the balancing act to try and get the output of each receiver to behave 'properly' could turn your hair grey in no time!



HF Propagation Beacons

Propagation forecasting is like weather forecasting: there are many variables that have to be accounted for. Over the years, the forecasting methods and computer programs have been greatly improved, but there are always more improvements possible.

The ionosphere refraction qualities vary constantly, and in order to follow as accurately as possible the changes, h.f. beacons have been installed around the world. These beacons transmit on a tight schedule a signal of varying power. Thus by listening from your own location to these beacons, you can get a very good feeling of the quality of the refraction path to the location of the beacons.

There are presently two main series of beacons being operated. The first one is a joint NCDXF/IARU operation, which is responsible for 18 possible beacons around the world. These beacons operate in the amateur bands and they all are equipped with the same type of equipment. Check the following Web page for more information on these beacons: <http://ncdxf.org/>

Every Region

The beacons are located in about every region of the world, so by listening to their signals on one frequency, you can visualise very rapidly what the

conditions are around the globe. What is interesting with these beacons is the fact that they transmit a signal of decreasing power: 100, 10, 1 and 0.1W, and you can hear the signal getting fainter and fainter till it is finally lost in the noise.

The transmissions are continuous, on schedule, around the clock. The total transmission time during one cycle on each frequency is only 10 seconds, the timing at all stations is accurately maintained by using a GPS receiver as the clock.

List Of Locations

Here is a partial list of the locations: United Nations HQ, USA, Canada, Venezuela, Sri Lanka, Australia and Japan. Eleven more sites are presently operational, or are scheduled to become operational in the near future. The frequencies used are: 14.100, 18.110, 21.150, 24.930 and 28.200MHz.

A second series of beacons is being installed and operated under the aegis of the ITU (International Telecommunications Union) by at least two countries. The original intent of the ITU was to have as many countries as possible install propagation beacons and gather as much information as possible from automatic receivers.

The signal transmitted by these beacons is a fairly complex one, but was designed so that it would be possible to gather as much information as possible and the information could be computer analysed.

PROPAGATION

This ITU field-strength measuring campaign will eventually produce the necessary data to help improve the propagation forecasting techniques and softwares even more. The specifications for the transmitting and receiving equipment to be used are fairly stringent, making it possible to compare the results between stations.

The transmitted signal format is a complex one, using a c.w. (continuous wave) and f.s.k. (frequency shift keying) modulation combination. The signal contains all the information necessary to automatically extract the data required to obtain the hourly field strength at the receiving site.

Two Countries

To date, only two countries have installed transmitters for this campaign: Norway with station LN2A, and Australia with station VL8IPS. The transmitters and antennas used at these stations are completely dissimilar, but these two stations use the same set of frequencies: 5.470, 7.870, 10.407, 14.405 and 20.945MHz.

As more transmitters are added to this chain, it will become necessary to find additional frequencies, this will become necessary as the transmission cycle of these two stations is four

minutes on each frequency, compared to 10 seconds for the NCDXF/IARU beacons.

The frequencies presently used by the ITU beacons are not protected, so at night on the 7MHz frequency there is serious QRM by a FAX station. Maybe when more stations are added to the network, the frequencies used by these beacons will be protected from interfering signals. If you want to learn more about the ITU beacons, check the following web pages: <http://www.ips.gov.au/beacon/> and http://www.itu.int/itudoc/itu-r/sg3/hf_e_34502.html

Other Beacons

There are also other beacons used to check the propagation, they are mostly operating in the amateur bands, and a full list can be obtained by visiting the following Web site:

<http://pw2.netcom.com/~ac6v/pagead.html>

The information gathered from all these beacons will, over time, help improve the quality of the radio propagation forecasting. As a weather forecaster in a previous incarnation, I compare these beacons to new weather stations that help fill the gaps in your knowledge of a specific territory.



Ionospheric Modification

In the last few years we have heard and read a lot about Project HAARP and the installation of the necessary equipment in a remote region of Alaska. It might surprise many readers that ionospheric modification, as will be attempted by this project, is nothing new! The first report of possible ionospheric modification by radio wave was reported in 1933 by Tellegen (1). At that time, it was not yet fully understood, but it already had a fancy name: 'The Luxembourg Effect'. Why this name? And what was this effect?

In the early 1930s, a very powerful low frequency (l.f.) radio transmitter was installed in Luxembourg, and the programs transmitted by this

installation were being heard mixed with another program transmitted by another site and being received in another part of Europe. It was postulated in 1934 by Bailey and Martin (2), that the transmissions from the Luxembourg transmitter were

actually modulating the ionosphere and interacting with the other transmissions in Europe.

Very High Power

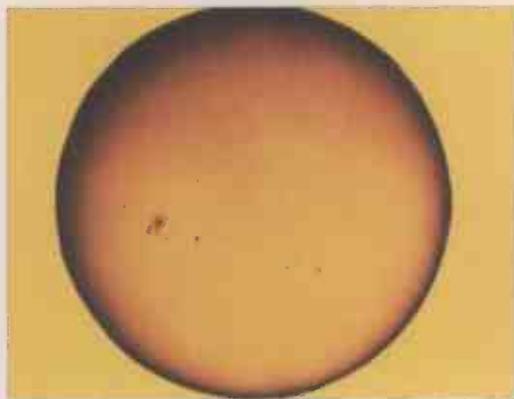
It should be noted that in Europe and in North Africa, l.f. transmitters operating in ITU (International Telecommunication Union) Region 1 utilises very high power. For example, it is not unusual to see some of the l.f. stations list their power as 1000, 2000kW and, in some cases, higher.

I am assuming here that this is the power at the antenna. If this assumption is correct and the efficiency of the transmitters is about 25%, we are looking at transmitters consuming between 4000 and 8000kW of power. That is the equivalent of 80000 regular home lightbulbs or 40000 PCs, operating or lit at the same time! Now this is power! I am glad I do not have to pay the electricity bill!

The Phenomenon

The Luxembourg effect phenomenon was then described by Frederick Terman in the 1943 edition of his book *Radio Engineers Handbook*, but from reading the short paragraph describing the Luxembourg effect, it would appear that Terman was not fully convinced of the reality of this phenomenon.

For a while, the phenomenon was forgotten, but was probably still 'up there'. It was then observed



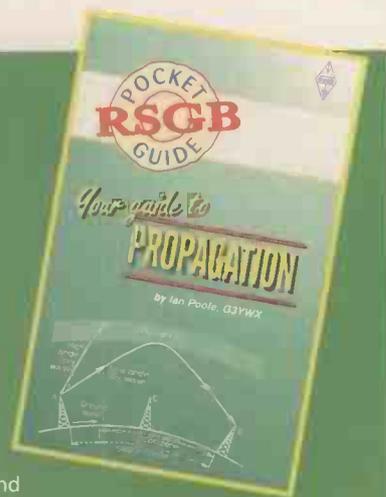
Book Profile

Your Guide To Propagation

Whatever your interest in radio, understanding the propagation of signals is of great importance. If you wish to hear or work DX stations around the world, it's vital to know not only the characteristics of each band, but how other influences, such as the time of day and the state of the sun, can affect it.

This handy pocket-sized guide covers normal propagation modes at frequencies from h.f., right up to v.h.f. and u.h.f., together with more unusual ones, such as meteor scatter and transequatorial propagation. The simple and readable treatment of the subject makes it an ideal choice for beginners as well as enthusiasts. **£6.95.**

See pages 86 & 87 in this issue or visit www.pwpublishing.ltd.uk/books/ for lots more information on radio-related books. Internet users can order on-line.



again in the 1960s when the modulation of the transmitter from the Voice of America, operating on 173kHz, located in Germany, was being heard on many other transmissions in Eastern Europe. It was also reported that at the same time the I.f. transmitter of Radio France International was causing similar effect on signals being transmitted from other sites in Western Europe.

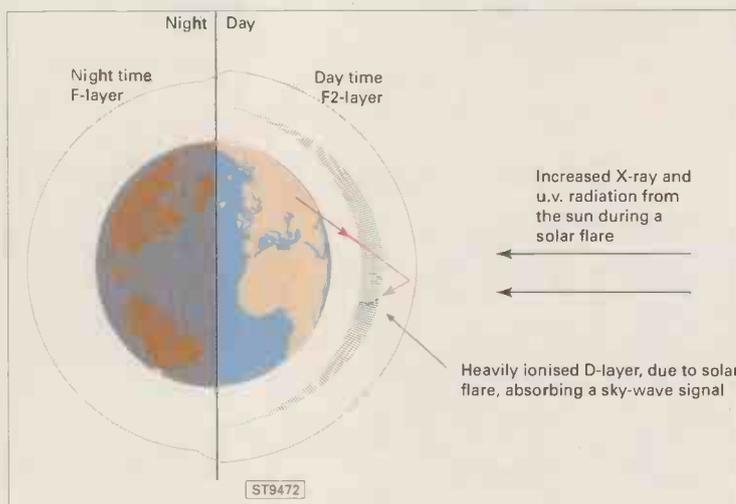
Is this phenomenon strictly confined to the I.f. part of the spectrum? It appears that it can be found also in the medium wave (m.w.) part of the spectrum. A few years ago, some discussions of this topic on the Internet revealed that the Luxembourg Effect was 'alive and well' in Iran.

In the 1970s new radio networks were set up across this country and high power transmitters were installed in many cities and towns in this country. The Luxembourg effect appeared on the transmissions of various transmitters across the country.

Transmitter Power

What is interesting in all the examples cited above is that in all cases the transmitter power was very high to extremely high (about equivalent to 8000 lightbulbs!), and the transmitted frequencies were in the I.f. and m.w. part of the spectrum.

Will project HAARP shed some light on the Luxembourg Effect and what causes it? I really do not know, as HAARP and other similar projects around the



world (there are a few more) are operating on frequencies above 2MHz. Only time will tell what these projects will be able to answer in relation to this peculiar Luxembourg Effect.

(1) Telegen, B. D. H., 'Interaction Between Radio Waves?' *Nature*, 6, 369, 1933.

(2) Bailey, V.A. and D.F. Martyn, 'Influence Of Electric Waves On The Ionosphere', *Phil. Mag.*, 23, 369, 1934.



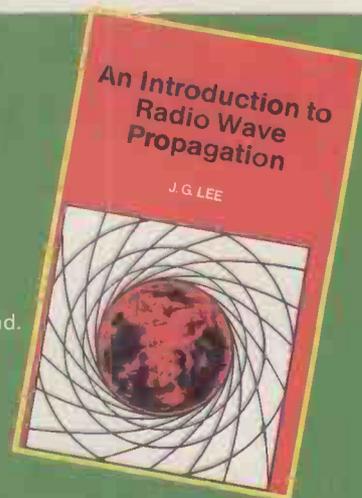
Book Profile

An Introduction To Radio Wave Propagation

This handy pocket-sized book has been written with the average electronic hobbyist in mind. Technical language and mathematics have been kept to a minimum in order to present a broad, yet clear, picture of the subject. The radio amateur, as well as the short wave listener, will find explanations of the propagation phenomena, which both experience in their pursuit of communications enjoyment.

Order your own copy now from the *SWM* Book Store for just **£3.95.**

See pages 86 & 87 in this issue or visit www.pwpublishing.ltd.uk/books/ for lots more information on radio-related books. Internet users can order on-line.



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Propagation Forecasting

Many readers and listeners are puzzled by the radio propagation forecasting graphs or tables found in various magazines. I will try to explain the main types of propagation forecasting and what they are used for. There are two basic types of propagation forecasting: 'nowcasting' to see what international broadcaster can be heard, or, for the amateur radio operator, who could be contacted at the present time; and the really 'long-term forecasting' that you will see displayed in magazines, or used for the long term planning of frequency use and transmitting station location/construction.

The 'nowcasting' type of forecasting is used normally on fixed circuits when you have a frequency agility capability and can choose at a moment's notice which frequency you can use on a specific circuit. Think of the armed forces and organisations that have many frequencies spread across the r.f. spectrum, available for communications if and when required. Some 'nowcasting' programs even have the capabilities of accessing the up-to-date A and K indices via a computer modem and automatically updating these indices on a regular basis.

Long-term type of forecasting is more often used for frequency management: finding and registering the best frequency (ies) that will be used during a specific broadcasting season for a specific circuit. Think of the broadcasters that have to make frequency management decisions, months, and in some cases years, ahead of time.

Another use is for planning the construction of a new relay station to serve a specific target area or buying time from another broadcaster's station

to cover a very specific target. In this age of decreasing money availability, buying or exchanging time from or with another international broadcaster versus building a new station is a crucial decision.

Propagation Forecasts

I presently prepare radio propagation forecasts for magazines and web sites, and when I prepare these forecasts I can only assume that the ionosphere will be 'normal' when the publications come out or the web sites are updated. There is no way I can forecast what the sun will exactly be doing in a month from now, much less three months from now!

So I prepare predictions without taking into account the A and K indices, letting the user make the decision if the predictions will be correct according to the indices available that day. What I am really doing is telling the listener/user:

"Assuming that the sun follows its normal pattern, on the circuit from London to India, Australia in July 1999, the best frequency (Optimum Working Frequency or Frequence Optimale de Travail) should be around 12.5MHz. Do not expect to find any reliable transmissions above 17MHz, the maximum usable frequency."

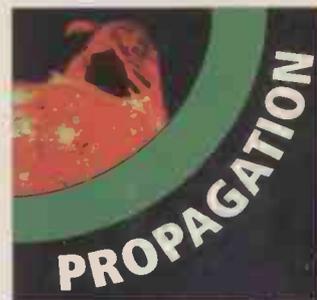
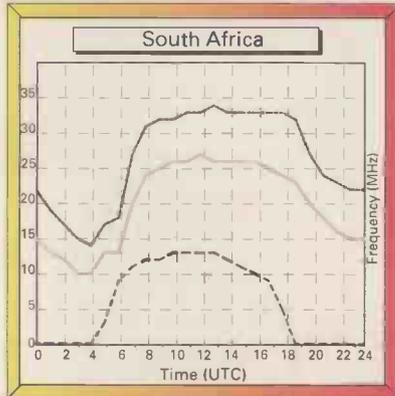
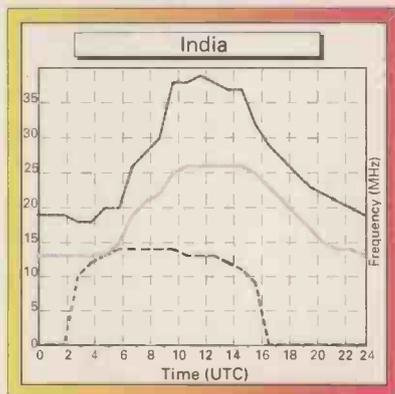
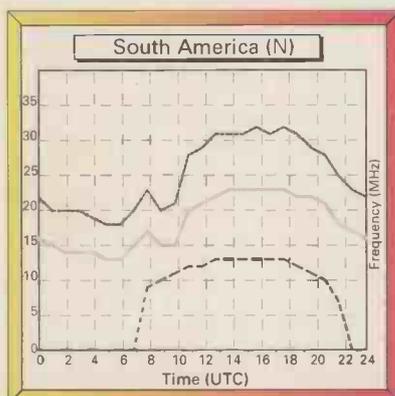
Different Technique

If I was offering a 'nowcasting' service to a user, I would be using a different technique and would say: "According to the trend of the indices and the actual indices recorded today, the MUF on the North America - Australia will be 17MHz and the best frequency (FOT) for your use is 12.9MHz."

The A and K can be taken into account if you are doing some 'nowcasting' and have a program that will accept one or the other. But, if you do 'nowcasting' you have to be very careful and not use only the 'numbers' available for that day. It is necessary to use a mean of the A or K or SSN or Flux to plug in the program; a running mean of 10 to 15 days should be

sufficient to give you a good set of numbers to use in a program that will accept these numbers.

SWM



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

Propagation Forecasts

How to use the Propagation Charts.

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

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

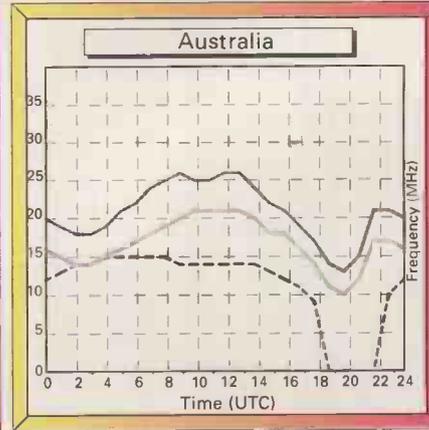
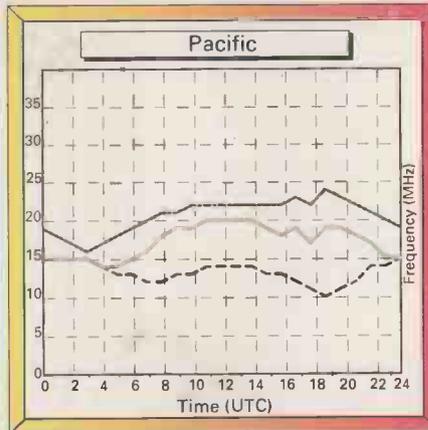
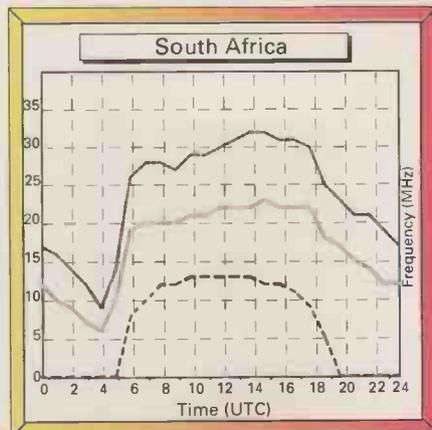
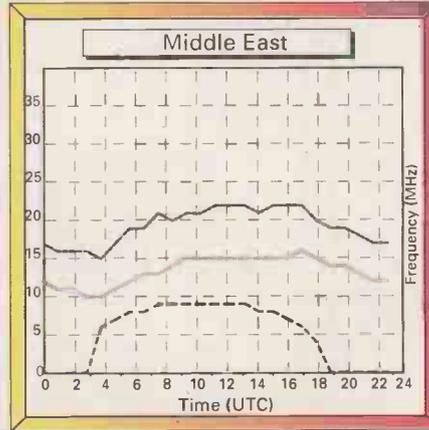
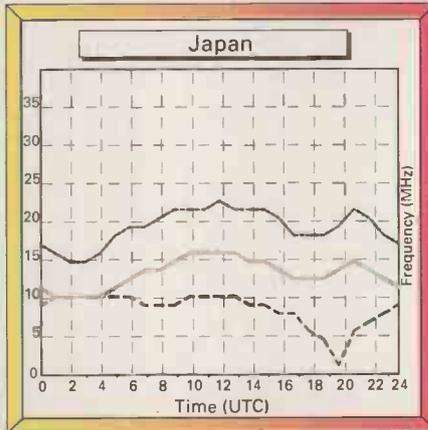
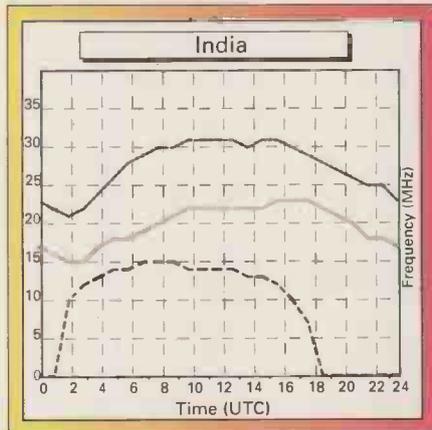
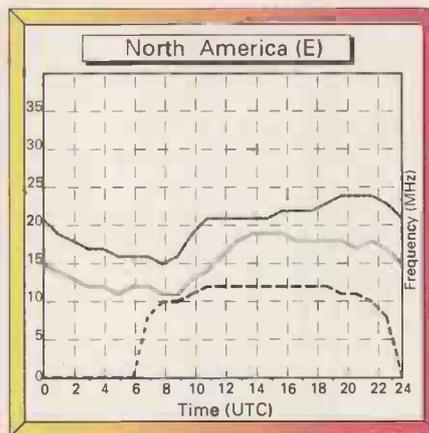
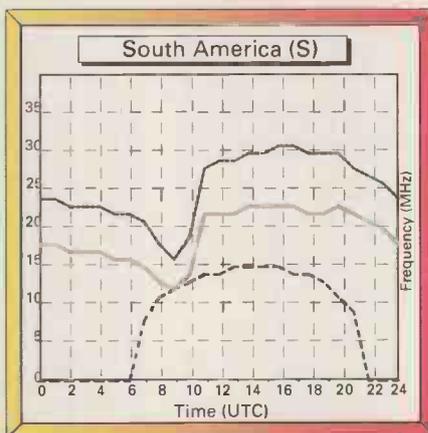
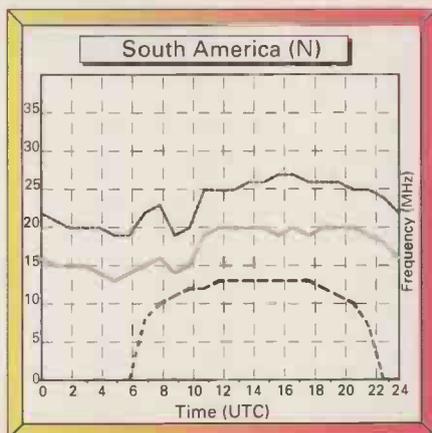
Lastly, the upper dashed line, represents the maximum usable frequency (MUF) a 50%

probability of success for the path and time.

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

Good luck and happy listening.

May 1999
Circuits to London

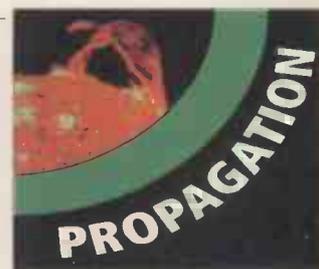


SK9623

■ KEVIN NICE G7TZC, SWM EDITORIAL OFFICES, BROADSTONE ■ E-MAIL: kevin@pwpublishing.ltd.uk

Propagation Extra

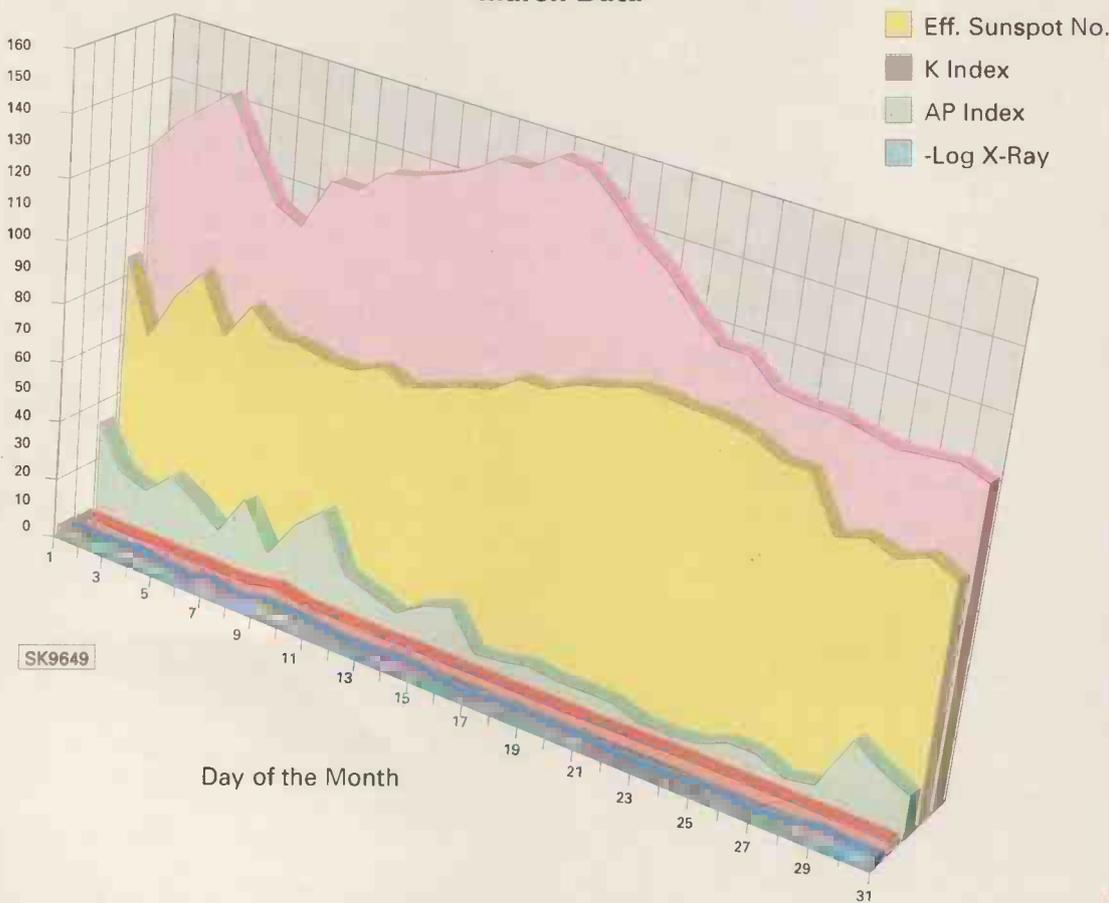
Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, March 1999.



PROPAGATION SPECIAL PROPAGATION SPECIAL PROPAGATION SPECIAL



March Data



guide to the chart

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

The K and AP indices are measures of geomagnetic activity.

The K index ranges from zero (very quiet) to nine (severely disturbed). K values of five or greater correspond to geomagnetic storm conditions that can relate to poor propagation conditions.

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

Icom IC-PCR100

Having already reviewed its big brother for another publication, Faris Raouf gets his mits on the IC-PCR100 computer controlled receiver.



I reviewed Icom's first foray into the world of computer-based receivers, the PCR1000, over a year ago for *PC Direct* (one of the computer magazines I write for) and remember being very impressed with it indeed, mostly because it was so easy to use, offered a wide frequency coverage, and had just about every feature the average user could ever wish for. It was a tad on the expensive side at its launch, and although you can now pick one up for around £250, this is still slightly too high a price for many pockets.

Icom isn't known for resting on its laurels, however, and just recently introduced a new computer-controlled receiver, the PCR100, at a much more affordable price of £199. Admittedly, it lacks the PCR1000's s.s.b. receive capabilities, but it does still cover 100kHz to 1.3GHz, offers all the main features of its big brother, and throws in a few new ones too. Combined with a well-designed Windows-based user interface, this makes it both an affordable and a very useful computer-controlled radio.

At First Glance

On opening the box, I found seven items; the PCR100 itself, a user manual, a serial cable, a pair of floppy disks, a mains power supply, a 12V power cable and a simple long-wire antenna.

At first glance, the PCR100 is rather unimpressive, its plastic casing lacking any form of control whatsoever, and having just one l.e.d. on

its front panel, which illuminates to tell you the unit is switched on. Just picking it up reveals it is built very solidly indeed, however, as underneath the plastic is a strong steel chassis, which makes it weigh a lot more than you might expect.

The rear of the PCR100 isn't exactly festooned with connectors, but all the basics are there - a BNC antenna connection, a ground terminal, a coaxial power input socket, an external speaker socket, and the all-important RS-232 connector, in this case a 9-pin D-type to conserve space.

Installing the hardware is really very simple, and covered reasonably clearly in the manual. The first step is to connect the supplied antenna to the antenna socket, ideally stringing the wire high up and away from the likes of computers, TVs and other electrically noisy items. Earthing the unit via its 'ground' terminal is recommended, but optional.

Next, you'll need to provide power to the unit via its power socket. Two options are available here - either use the supplied 12V mains adapter, or connect the unit to another 12V supply using the supplied 12V power leads. Finally, you need to connect the PCR100 to your PC via the supplied serial cable. This has 9-pin connectors at both ends, so if your PC only has a 25-pin serial port free, you'll need to buy a 25-pin to 9-pin adapter.

Having dealt with the hardware installation, the next step is to install the software, which incidentally is totally different to that supplied with the PCR1000. The software requires Windows, and should install on just about any PC faster than about

Review

a 100MHz 486DX4, as long as it has at least 16Mb of RAM and 10Mb of free disk space. Ideally, however, you should have a Pentium-based PC and a display subsystem capable of running at 800 x 600 resolution.

Getting It Going

On firing up the software for the first time, you are asked to specify which serial port you've attached the PCR100 to, this usually being COM1: or COM2: Nothing too drastic will happen if you get it wrong, mind you - the PCR100 just won't respond to the PC's instructions - and you can switch serial ports from within the program as necessary.

Once up and running, you'll be greeted by an on-screen representation of a rather sophisticated receiver, along the lines of Icom's IC-R8500, but with some bells and whistle added. This type of display is called the multi-function receiver screen, from which you can control most of the receiver's functions directly. You can switch to a more basic display if need be, however, where only a few of the receiver's functions and controls are visible at any one time, in order to conserve screen space, but still see what's going on and also to make any adjustments to the receiver's settings.

As you can see from the screen shot, the main component of this mode is the status and frequency display area, where the frequency you are listening to is shown, along with the strength of the received

signal via a 14-segment 'S'-meter, the receive mode, current tuning step, filter width (both graphically and as a figure), plus the bank name and number and bank memory location name and number, if this is a stored frequency.

You'll also find the PCR100's graphical band-scope display in this main part of the multi-function receiver screen, plus information on how this is configured, plus a few extra status indicators, such as whether you've enabled the receiver's automatic noise limiter or not.

Just underneath the status display are a set of seven buttons, four of which allow you to switch between a.m., f.m., w.f.m. (wide f.m.) and automatic receive modes, this latter deciding on the best mode to use for the frequency displayed based on a user-programmable band plan, while the remaining three activate the receiver's a.m. noise limiter, 20dB attenuation and tone squelch circuits.

Yes, I did say tone squelch, because, rather impressively, this receiver can decode the sub-audible tones, only opening up the squelch when one of the 51 user-selectable tones is decoded. Oh, and talking of impressive features, the PCR100's w.f.m. mode actually allows the reception of stereo transmissions in stereo, though you'll need to plug external speakers into the unit's external speaker jack, or route its output into your PC's sound-card in order to hear them.

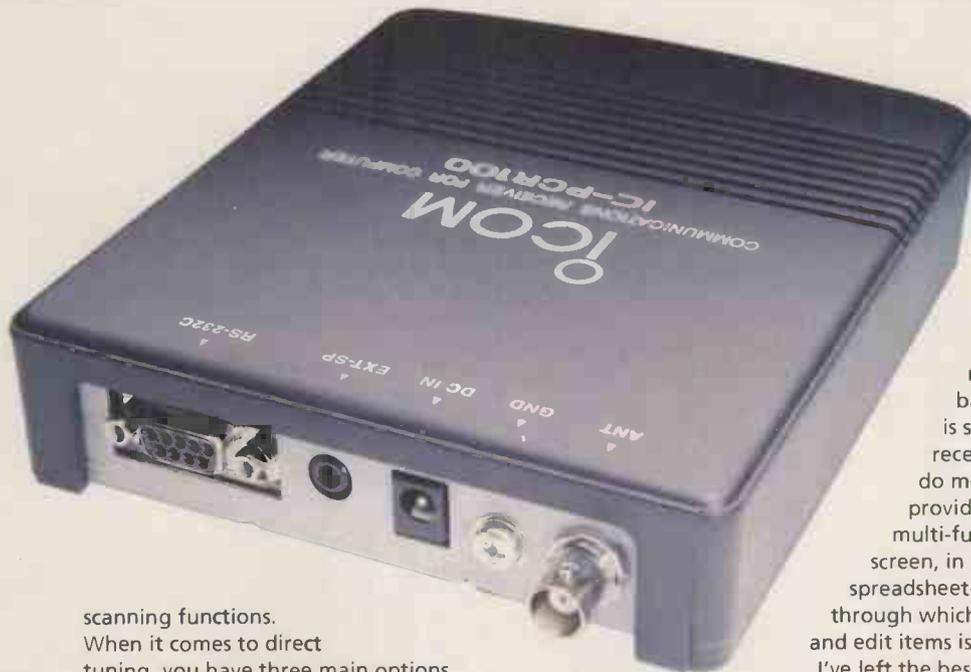
Below these last three buttons you'll find volume and squelch 'rotary' controls, which can be adjusted using the left and right mouse buttons, and two buttons marked 'WID' and 'NAR'. These two increase or decrease the receiver's intermediate frequency (i.f.) filter width. The settings possible with these depend on the receive mode, with 6, 15 and 50kHz options being available for f.m. and a.m., and 50 or 230kHz for w.f.m.

To the right of these buttons are controls to do with the PCR100's tuning, bandscope, memory and

"As you might expect of a product from the Icom stables, of course, the PCR100's scanning facilities are far from basic"



"In fact, I think this is a super little gadget, and one far more flexible, easy to use and powerful than any stand-alone scanner in the same price range"



scanning functions.

When it comes to direct tuning, you have three main options on the PCR100. The most obvious is to use your left and right hand mouse buttons on the large 'tuning' wheel to move up and down in frequency in steps ranging from 1kHz up to 10MHz (with 13 step sizes in-between) selected using the nearby TS+ and TS- buttons.

Surprisingly, no 8.33kHz tuning step option is on offer, nor does it appear to be possible to program a user-defined step. Ah well, you can't have everything. The other options for entering frequencies are to either use your mouse to click on the on-screen numeric keypad, or to simply use your keyboard's numeric keys. Clicking or pressing the on-screen ENT button or your keyboard's Enter (Return) key then makes the receiver jump to the required frequency.

Memory Mania

Because the PCR100 is strictly a computer-controlled device, I was very surprised to find that it actually has its own built-in memory locations, a healthy 1000 of them split into 20 banks, each bank and each memory location can be tagged individually

alpha-numerically. Creating or changing these names, as well as adding, changing or selecting a memory's contents and navigating through banks and memories, is simplicity itself - real receiver-like controls to do most things are provided as part of the multi-function receiver screen, in addition to which a spreadsheet-like window through which you can see, add and edit items is available.

I've left the best memory feature to last though...the PCR100's software allows you to use your PC's hard disk to

save all 1000 memories as a named file on your hard disk, allowing you to effectively create and maintain an unlimited number of memories. Admittedly you are limited to loading 1000 at a time, but this is unlikely to worry many people!

The PCR100's bandscope feature is good, but not ground-breaking. This has four on-screen controls, two marked with tape-recorder like icons ("Play/Pause" and "Stop") and two marked with real text ("SPAN+" and "SPAN-"), allowing you to run/pause or stop a band sweep and to set the width of the 'scope's sweep span from 100kHz to 2MHz in four steps. The tuning step used when sweeping is derived from the setting of the receiver's main tuning step setting, but if required you can impose one of three overrides on the step size, 1-100kHz, 1-5kHz or 1-25kHz.

It is worth noting that although you can point to a frequency within the bandscope and just click on it to make it the 'scope's centre frequency whether the bandscope is running or paused, it is **not** possible to hear any activity on the centre frequency when the bandscope is running.

Scanning

A modern receiver, computer controlled or not, isn't complete without at least a basic form of scanning function. As you might expect of a product from the Icom stables, of course, the PCR100's scanning facilities are far from basic, and consist of six different options; Programmed Scan, Memory Scan, Select Memory Scan, Memory Skip Scan, Mode Select Memory Scan, and Automatic Write Memory Scan.

Programmed Scan mode basically allows the PCR100 to scan between two edge frequencies, pausing when an active frequency is found, with up to 20 of these edge frequencies (plus step size, receive mode, filter



Continued on page 34...

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Comments from John Griffiths

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

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Comments from John Griffiths

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Short Wave Magazine, May 1999

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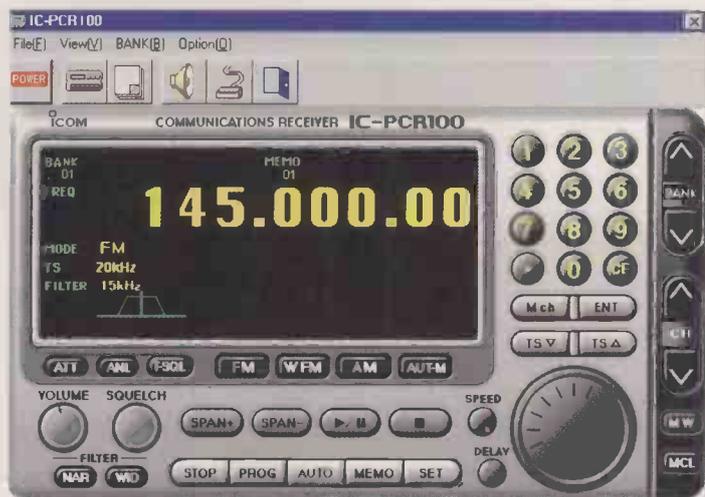
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As you can see from the screen shot, the main component of this mode is the status and frequency display area, where the frequency you are listening to is shown.

You'll also find the PCR100's graphical band-scope display in this main part of the multi-function receiver screen, plus information on how this is configured, plus a few extra status indicators, such as whether you've enabled the receiver's automatic noise limiter or not.

...continued from page 30

settings and so forth) being programmable and nameable for quick and easy access. Incidentally, when you save or load the PCR100's main memory contents to or from your hard disk, you'll also be saving or loading all the receiver's other settings too, including all programmed edge frequencies, so again you could technically have an unlimited number of these, all accessible via just a few mouse clicks.

Memory Scan mode simply allows you to get the PCR100 to scan through a particular memory bank. Select Memory Scan, Memory Skip Scan and Mode Select Memory Scan are variations on this theme - Select Memory Scan allows you to select a subset of memories within a bank and have just these scanned, while Memory Skip Scan allows you to select memories to be skipped when scanning a bank, and Mode Select Memory Scan allows you to scan only memories within a bank containing a particular receive mode setting (a.m., f.m. and w.f.m.).

Best To Last

Again I've left the best to last. Wouldn't it be nice if you could tell your scanner to scan between two frequencies over and over and store any active frequencies into a memory location totally automatically? Well, this is exactly what the PCR100's Automatic Write Memory Scan mode does.

Technical Specifications

Frequency Coverage:	100kHz to 1300MHz (specifications guaranteed 500kHz to 1300MHz only)
Receive Modes Supported:	a.m., f.m., w.f.m. (with stereo reception support)
Receive System:	Triple superheterodyne (a.m./f.m.) Double superheterodyne (w.f.m.)
Frequency Stability:	±5ppm at 1300MHz
Intermediate Frequencies:	1st: 266.7MHz 2nd: 10.7MHz 3rd: 450kHz (except w.f.m.)
Selectivity (typical):	f.m./a.m. 6kHz/-6dB f.m./a.m. 15kHz/-6dB w.f.m./f.m./a.m. 50kHz/-6dB w.f.m. 230kHz/-6dB

All you basically have to do is select one of the Programmed Scan edge pairs you've already created, (or create or edit and store a new pair, along with the required step size, receive mode, etc.), then select the memory bank you want the automatically located frequencies to be stored in, and then press the Auto button you'll find on the main multi-function receiver display window. Its as simple as that.

In Use

In use, the PCR100 proved to work very well with its standard long wire antenna, picking up signals as well as my MVT-7100 and AOR AR8200 hand scanners when used with their standard antennas. Not unexpectedly, the PCR100 didn't perform nearly as well as my Icom IC-R8500, however, which is currently connected to a relatively large external antenna. Attaching this external antenna to the PCR100 proved to improve its reception in general, but as I'd expected, since the PCR100 is closer in its specification to a typical hand scanner than anything else. At times I experienced a lot of strong signal breakthrough, the same sort of problem I'd experience if I attached this antenna to a hand scanner.

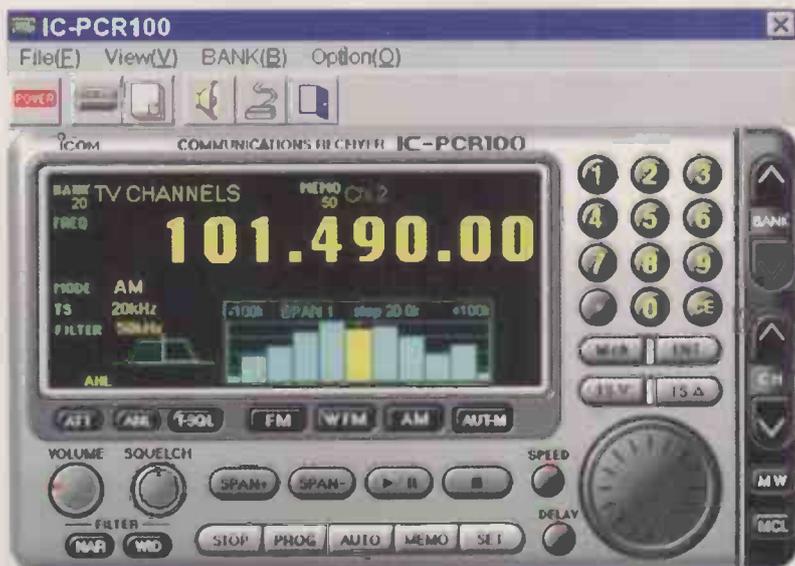
Conclusion

I have to admit I was a little annoyed to find that it isn't possible to scan through selected memories located in more than one bank, and rather dismayed to find that it isn't possible to change the size of these banks either. But these are the only real drawbacks of the PCR100, and considering it costs less than £200, ones I think can be lived with.

In fact, I think this is a super little radio, and one far more flexible, easy to use and powerful than any stand-alone scanner in the same price range, though admittedly not be nearly as portable.

Thanks to **Icom (UK) Ltd., Sea Street, Herne Bay, Kent CT6 8DL, Tel: (01227) 741741, E-mail: info@icomuk.co.uk** web site: <http://www.icomuk.co.uk> for the loan of the review unit.

SWM



National Field Day - 1942

Amateur radio's national field day held in 1942? That's totally impossible, I hear you say. No one had a licence to operate during the war. But it did actually take place without the knowledge of the authorities or the Radio Society of Great Britain. How can this be? I will refer back to March and April's articles in *Short Wave Magazine* about the history of Hanslope Park radio station, because this is where it all started, when over a hundred radio amateurs were sent to Hanslope in 1941 to spy on the enemy intelligence network.

Initially they were operating from The Lodge at Bullington End and some others were in the makeshift intercept station in the corn bins of the granary at the farmyard. But in May 1942, a brand new intercept station had been built and opened and all the amateurs were transferred to it from the Lodge and the granary.

Opening Day

On the opening day, the first shift arrived to be confronted with a sight that any amateur would dream about - 66 brand new HRO communication receivers, each one connected to wide band amplifiers for maximum signal transference and an amazing antenna system that consisted of many Rhombic and Vee beam antennas spread out over the largest antenna field that any of them had seen. It was about one and a half miles across.

A system of antenna selector switches on a front panel underneath the HRO's meant you could select either the directional antennas or the semi vertical antennas which were not connected through the wide band amplifiers. After the initial excitement of finding they could hear signals from anywhere in the world, they got down to the important tasks of eavesdropping on the huge enemy spy network that spread from the northern Scandinavian countries to north Africa and the Balkan countries, and the important south American clandestine spy network.

Once this had settled into a daily routine, it did not take long for some of the amateurs to discover that the local oscillator of an HRO actually radiates a small signal back up the antennas that were not connected through the wide band amplifiers. Another one discovered that by using an antenna selector switch like a Morse key, he could send Morse code from this oscillator at low power.

Word passed quickly to all the 120 radio

amateurs and they started to utilise it to contact each other all over the radio station by waiting until a very quiet period, usually when the enemy operators were asleep. And by using the 10 and 20m amateur bands when they had gone dead.

Genuine Radio Skeds

As each operator was not allowed to talk to anyone when they were on duty, it was very easy to keep genuine radio skeds with your friends. One bright spark amongst them was looking at the calendar for summer 1942 when he suddenly realised that in peace time it would be National Field Day on the very next day. So he quickly informed all the other amateurs and that weekend saw all the operators apparently alert and wide awake for the whole 24 hours all busily calling TEST NFD (radio amateurs were not allowed to call CQ before

licences were revoked).

Hundreds of contacts were made and all the contacts were verified many weeks later when genuine QSL cards were produced from all those that had been left over after licences had been withdrawn. Fifty three of those original QSL cards survive in my collection today and included among them are cards from Pat Hawker G3VA (of technical topics fame in *RadCom*), Lou Varney G5RV (he invented the G5RV antenna), Dud Charman G6CJ (of aerial circus fame) and Gerald Marcuse G2NM.

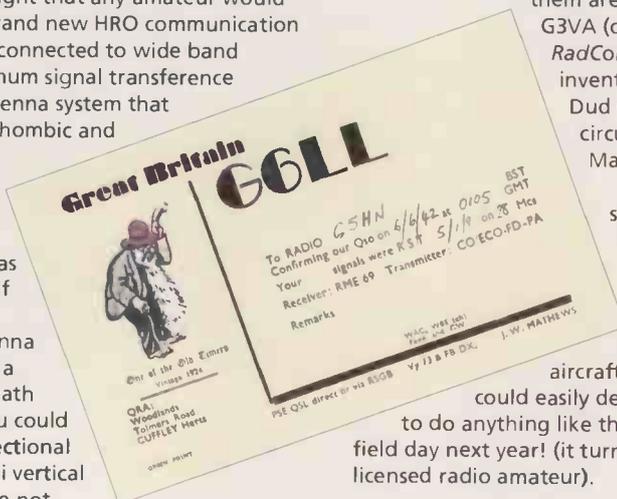
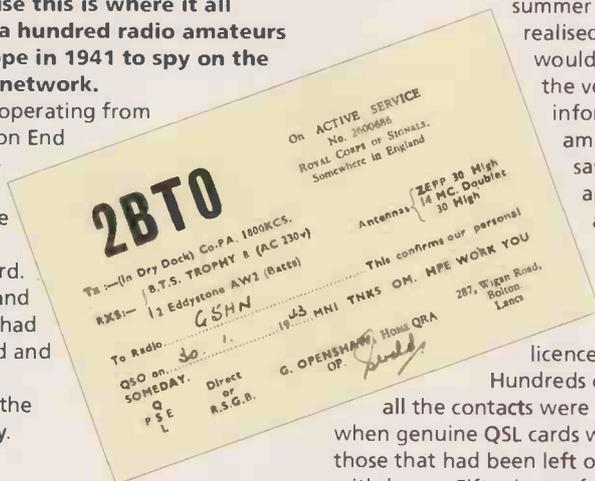
Eventually, of course, the station commander Reg Wigg found out about these highly illegal happenings and gave them all a rollicking lecture on how enemy aircraft or other eavesdroppers could easily detect these signals and not to do anything like this again. At least not until field day next year! (it turned out he was also a licensed radio amateur).

Longest Field Day

Quietly though, the operators continued their unofficial radio contacts. The last one being on the 8th September 1945 and thus it became the longest field day of all time (albeit unofficially) with signals passing all over the antenna field.

No one ever found out how far the signals radiated as no one ever reported them and the RSGB and the authorities only knew when it was revealed many years later by Pat Hawker G3VA long after licences had been re-issued in 1946. If enemy aircraft passing overhead ever did hear the amateur radio contacts, they must have thought it was still allowed because the operators were using their own genuine callsigns. Acknowledgements to Pat Hawker G3VA, Gerry Openshaw G2BTO and Maurice Handcocks G5HN, who confirmed that this is a true story. **SWM**

Did you know that back in 1942, in spite of WWII, amateur radio's national field day took place? David White G3ZPA explains all.



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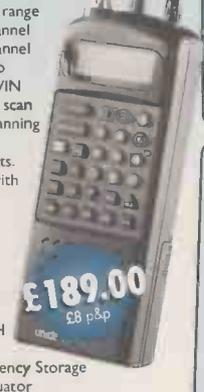


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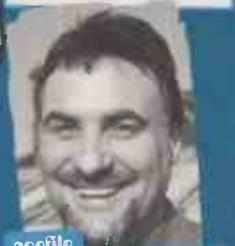
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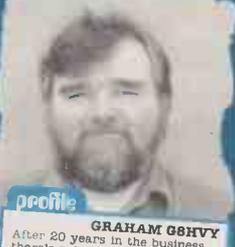
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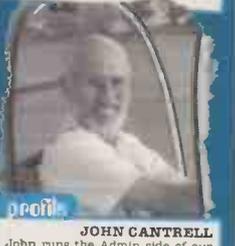
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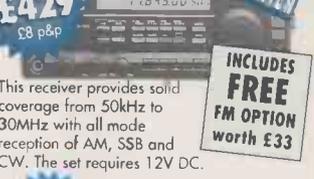
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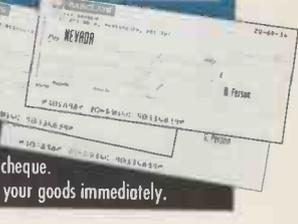
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A Day In The Life Of...

J. Edward Brown brings us more interference tales of Kilocycle Ken & Young Golly.

Mongrel Mob Interference

"We don't usually come to places like this," Young Golly the Trainee Radio Inspector said, nervously.

This place was the Maori Mongrel Mob gang headquarters, an old railway station, the lines torn up, sold, the building surrounded by a high corrugated iron fence topped with barbed wire. From the signal box of the ex railway station a Maori stared down, like a prison guard.

Kilocycle Ken the Senior Radio Inspector stared into the glass eye of the surveillance TV camera. He was afraid? Of course he was afraid. Everybody was frightened of Maori gangs. The police wouldn't come here without a bulldozer, riot shields, helmets, body armour, and the armed offender's squad behind, or in front.

The radio inspectors had been called in by a serviceman who had set up a new large screen TV. The set was affected by QRM.

"Radio inspectors to see Hori," Kilocycle Ken said.

"Short for Horrible?" Young Golly said.

"Maori for George."

The gate opened to a large Maori, 20 stone, straggling beard, long-haired, tattooed face, motor cycling boots, leather jacket, a Nazi style steel helmet.

"We're getting interference," Hori said dangerously.

"And I want it fixed."

"That's why we are here," Kilocycle Ken said soothingly.

In the main room, which might have been the old waiting room, two small children regarded them solemnly with large brown eyes.

...Ken watched the goldfish...



"Men to fix our problem with your television programmes. They like the Muppets, especially Miss Piggy, but the only pig I like is cooked in a hangi."

Large Television

The space was dominated by the large television showing American football.

"A Seleco HDFP 1250," Hori said proudly. "It cost 3,000 English pounds, got sound surround, Bose speakers, just like going to the pictures. It had convergence problems which the tec fixed, but he says interference is your problem," Hori said dangerously.

"It's too big to have fallen off the back of a truck," Young Golly said.

"What do you think I am, a thief?" Hori said.

"Of course not," Kilocycle Ken said hastily.

"I like to get the big picture. And it should be perfect."

"If it's not the power lines then it must be an inside job," Kilocycle Ken said. "You're a long way from anywhere."

"We can see for miles around. And we own most of the land, growing oats this year."

"No neighbours to cause or complain about interference," Kilocycle Ken said.

"The boys like to party, got a karaoke machine, all the old favourites, Frank Sinatra is mine."

"No interference on now. You've got other electronic gear?" Kilocycle Ken asked.

"Sure, couple of computers, kids like to play games, but need it for our business, got an intruder alarm, hi-fi, cellphones, hey, see the latest, they reckon cellphones interfere with electronic braking systems on cars, not much chance of that on my old Holden." Hori grinned.

"Business?" Kilocycle Ken said.

"We've got a big gorse cutting contract, most of the boys are out on that."

"Do you use the Citizen Band to keep in touch?" Kilocycle Ken asked.

"No, CB is children's band stuff, we are professionals, got cellphones, pagers. People got the wrong idea about us. We work, shearing sheep, fencing, building."

Antenna Check

Young Golly did an antenna check with the Unaohm while Kilocycle Ken watched an enormous gold fish in a tank with a heater.

"Marginal field strength," Young Golly said. "You need a bigger antenna."

Short Wave Magazine, May 1999

A Radio Inspector

"You guys put one up?" Hori asked.

"We are the government, we don't put up antennas," Kilocycle Ken said.

"Social Welfare pay for an antenna?" Hori said.

"Government has got out of that business."

"Everything is changing," Hori sighed.

"Have you got a television licence?" Young Golly asked.

Kilocycle Ken thought Hori might explode.

"Sure, you wanna see it?"

"That's alright," Kilocycle Ken said.

"We can check it out later against the computer listing," Young Golly said.

"Shut up," Kilocycle Ken hissed.

"You want to buy a railway ticket?" Hori asked. "Got some tickets."

"Where to?" Kilocycle Ken asked.

"Nowhere, you missed the last train."

Was that a threat?

Maori gangs were common in some parts of New Zealand, young men, and women, living in old houses which they fortified, and where, allegedly, they dealt in drugs, stored stolen property, drank beer, held parties that went on for days, and went forth to do battle with other gangs, frightening citizens, riding noisy motor cycles in large groups, disobeying the road rules, and other laws.

"Have a drink," Hori said.

Kilocycle Ken sat on a new white leather couch, took a large beer.

"You want a glass?" Hori asked, dangerously.

"No thanks," Kilocycle Ken said.

Hori grinned. "Like a cigarette?"

"No, gave it up," Kilocycle Ken said.

Young Golly said, "Sure."

Did he expect marijuana?

He was offered a pack of Drum tobacco to roll his own, which he did, inexpertly.

Borrow Tapes

"You only watch sport and children's programmes?" Young Golly asked.

"We borrow tapes from the public library, they are cheaper than the video shop, and better films, classic BBC stuff. We record programmes, looking at that one, 'In Search of the Trojan War' now, BBC documentary series. Homer was dead right about the siege of Troy, he wasn't just a story teller, he was an historian. Troy, great place for a fort, Greeks and those old time people were great warriors. I find it fascinating, excavating, finding the old artefacts, conjuring up stories about them. But we got it mainly for the football and the cricket. Do you play football?"

"Cricket," Young Golly said.

"Good game," Hori said. "What are our chances against the Poms this year?"

Kilocycle Ken shivered.

"You cold? I'll turn on the heater."

The electric radiator consisted of twin element bars in a surround which looked like an old-fashioned fireplace and with an artificial red and black bed of coals in front



of it, lit within by electric lamps.

"There's the interference!" Hori said.

...the gate opened...

Interference Disappeared

Kilocycle Ken jumped to the heater switch, turned it off. The interference disappeared. He turned it on and it was back.

"It's Barkhausen oscillation which gives those beady vertical lines on the left side of the picture, coming from the electric light bulbs in the heater. Barkhausen can also generate a moire pattern. I've found the sources to be old lamps with zig zag filaments, decades old, on back porches, or in wash houses, which are seldom switched on so the lamps last forever, though an industrial rough usage lamp has been manufactured in more recent years which gives the same trouble. That's what you've got here."

"Bugger me days," Hori said admiringly. "Who'd have thought it. You are a genius."

Kilocycle Ken dismantled the heater, the bulbs were changed to standard electric lamps and the trouble disappeared.

More Beer

Hori insisted on them drinking more beer, and more beer. They watched 'Gilligan's Island' then they ate fish and kumaras.

Finally Kilocycle Ken said they had to go.

"I can't drive," Young Golly said. "Too much beer."

"One of my boys will drive you back to the office,"

Hori said.

"Has he been drinking?" Kilocycle Ken asked.

"We have got people who don't drink."

"Has he got a driver's licence?" Young Golly asked.

"And how does he get back here."

"Taxi."

"Who pays?"

"Social welfare."

"That was one of the better days," Young Golly said.

"Indeed," Kilocycle Ken said.

SWM

The Icom IC-R75 Receiver - c

Although it's been 'hyped' for some time, the first sample of this brand new Icom set landed firmly in SWM's lap. It needed reviewing, guess who got the short straw?

John Wilson gives you the story.



The Japanese manufacturers have some strange ways! When a new model is under consideration, their overseas distributors are hardly made aware of it until it is almost in final production, and when they do talk to the distributors, dire warnings are issued about not revealing any details to the press or general public until the new model is actually in the showroom. Such seemed to be the case with the Icom R75, rumours of which were circulating late last year, but without confirmation from the appointed distributors around the world. However, whilst this embargo on information was still in place, Icom themselves carried details of the R75 on their Web site in Japan, so it was not surprising that the R75 began appearing in 'taster' advertisements from several dealers.

The danger of making premature announcements is that without hands-on use, the preliminary details may not be correct, or may be misunderstood, leading to some embarrassment for the early bird advertisers. Those who said that the R75 was "A d.s.p. receiver" were slightly wide of the mark in assuming that it would be a potentially lower priced alternative to the JRC NRD-545, and it was actually with some relief that I discovered the true d.s.p. story when I received the first review sample from Icom UK. Why relief? Let me tell you later.

An Attractive Package

Unpacking the R75 revealed an attractive package measuring 241(W) x 94(H) x 229(D), in millimetres of course, but for those who think like me, about 10 x 4 x 9in. The receiver is easy to carry around, weighing only 3kg, with the separate a.c. power supply not much lighter. The photographs will show you what the front panel looks like, and you can see right away that everything is pleasantly and

conveniently arranged for ease of use and annoyance-free operation. The main display is that characteristically Icom orange-yellow, with black characters which are so easy to see, even for an operator who is slumped in an armchair. (It's that Cabernet Sauvignon time of the evening). I soon ceased slumping when I started to use the R75 because I found it a delight to have around, and as I delved into the various and plentiful options included in its operating system, I really enjoyed myself.

Icom owners will recognise many of the control designations on the front panel of the R75, but for the record, I should go through them for you. The main display is, as I have said, typically Icom and both informative and easy to read. The frequency readout is eight digits long, which means that you can read frequency to 1Hz, but have the option to switch to 10Hz tuning steps, in which case the last digit disappears from the display. In addition to this, the 'TS' (Tuning Step) button allows you to select tuning increments of 100Hz, 1, 5, 6.25, 9, 10, 12.5, 20, 25 and 100kHz. Should be enough to satisfy anyone, and includes the necessary broadcast increments as well as all communications channelling. (I know Algernon, it doesn't include 8.33kHz for the airband, but since the R75 doesn't tune the airband, that's a red herring). Finally, for rapid shifting, you can select 1MHz increments and leap across the r.f. stage like Nureyev in full flight.

As you fly up the bands you will suddenly realise that the R75 has gone beyond the usual 30MHz stop and finally ends at 60MHz, at which point it 'rolls over' and drops to the 30kHz bottom limit. Now that is some tuning range, and with Cycle 23 well under way, there are already openings on the 6m band which will astonish those who have never heard 'Six'

Can this be my dream fulfilled

in full song. Ease of tuning is helped by a well proportioned tuning knob set at exactly the right height above the bench, and adjustable tuning friction is provided by a small lever shyly peeping out below the knob.

If you want to ensure that the cat doesn't knock the receiver off frequency, another unobtrusive button will electronically lock the tuning knob function whilst leaving all other front panel controls operational - including the keypad. The keypad itself provides direct frequency entry from the front panel, but only recognises frequency in MHz, so for 909kHz you have to remember to punch in a leading zero '0.909', whilst for an excursion to listen to Rugby on 60kHz you punch in '0.060'. The inclusion of a 'kHz' button would have made life less stressful for those who are, like me, easily confused. However, its not a major drawback and does not detract from the enjoyment of using the R75.

By the way, if the optional speech synthesiser is fitted to the receiver, pressing the 'LOCK' button for two seconds will cause the frequency, mode and signal level to be announced via the internal loudspeaker. There's more! By use of the operator menu the speech synthesiser can be set to add the current time as well.

Mode selection is shown in the upper part of the display, with separate buttons selecting s.s.b., a.m., c.w./RTTY and f.m. Toggling between upper and lower sideband, c.w. and RTTY, and a.m. and a.m.s. (synchronous) is by alternate pressing of the appropriate mode button, whilst a further feature is the ability to toggle between c.w. and c.w. reverse, as well as RTTY and RTTY reverse.

DSP Reservations

Icom have certainly catered for most user's requirements, and the reception modes are enhanced even further when one comes to the i.f. filter switching facilities - and this brings me to the subject of d.s.p., which I introduced in the opening paragraph. Knowing my reservations about the odd audio quality which seems to accompany the use of i.f. d.s.p. in receivers I have tested in the recent past, the thought of listening to another d.s.p. receiver caused me some apprehension. However, to my utter delight, Icom have retained traditional filters for the i.f. section and reserved the d.s.p. functions for the audio section of the R75. Praise the Lord and pass the ammunition - here is an intelligent use of d.s.p. combined with all the

advantages of decent i.f. filtering.

Now even more delight; Icom, by using filters at 9MHz and 455kHz, have given us the facility of fully adjustable pass band shift and bandwidth selection by 'sliding' the two sets of filters around and across each other, exactly as Kenwood did in the R-820. The 'Twin PBT' function is available to the operator as a twin concentric control, the inner knob shifting the lower filter passband and the outer knob shifting the upper passband. This gives complete control over the positioning of the i.f. filter slopes, and if you grab both knobs and turn them together, the effect is that of moving the entire i.f. filter passband across the incoming signals to suit reception conditions - magic, and exactly what I always wanted to see in a modern receiver.

The system works extremely well, and is instinctively easy to understand in practice. Note however that if you have the 15kHz wide filter selected in the 9MHz i.f. and a narrower filter in the 455kHz i.f., the PBT may not have sufficient tuning range to overlap the two filters and you may think its not working - it is, but you didn't think it through. Best effects are when the two filters have matching bandwidths.

Five Filters

The standard filter complement supplied in the R75 comprises a 15kHz monolithic filter and a superb 2.4kHz crystal filter at 9MHz, with 15kHz and 6kHz ceramic filters at 455kHz and a Murata high performance 2.4kHz filter also at 455kHz. With a selection of five filters to go at, coupled to the most versatile firmware controlled menu available from the front panel, it is possible to tailor the selectivity in each mode to suit yourself; even to the extent of having different filter selections accompanying the

"You can see right away that everything is pleasantly and conveniently arranged for ease of use and annoyance-free operation."

Optional Filters



"The only thing which seemed strange to me was the use of the r.f. gain control - but I'm delighted of course that Icom have provided the facility."

same mode in different memory channels.

Now, to add to the facilities, the handbook lists no less than five optional 9MHz filters ranging from 250Hz to 2.8kHz, and another five at 455kHz ranging from 250Hz to 3.3kHz. There are only single slots at each i.f. to fit these filters, but since they are plug in mounting, there is no difficulty at all in fitting and/or removing them. Icom kindly supplied a matching pair of 250Hz filters for me to try out, and although these gave me the feeling that I was wearing trousers which were too tight, they certainly made sense of that old expression 'single signal selectivity'.

At the bottom end of 40m, even in the hubbub, you could only hear one c.w. signal at a time using these 250Hz beauties. As a final knuckling of the forelock to the c.w. man, the b.f.o. is adjustable so that you can centre a signal in the filter and then adjust the resultant audio to suit your own taste. As supplied, the audio beat was set to 600Hz, which is too low for me, but it took only a second or two to re-tune this to my usual 800Hz. Have they thought of everything? Just about everything it seems.

The filter selection system allows up to three bandwidths to be selected in most modes, and the user has access to a simple menu for allocating the 9MHz and 455kHz filters to the wide, narrow and normal bandwidths in each reception mode. Once set, the right filter choice comes up in each mode, and any setting can be changed in seconds by running up the menu. Simple but tremendously flexible and a tribute to the firmware designer who thought it up.

Tailored Heavily

Having said all these nice things, it's a bit sad that once again we have a receiver which is tailored heavily towards s.s.b. and c.w. reception, with a.m. getting only the 6kHz filter it deserves at 455kHz, and that only a modest performance ceramic. With a matched pair of 6kHz crystal filters at 9MHz and 455kHz coupled to the passband tuning facility, this would be a broadcast listener's receiver to dream about. Perhaps there may be such filters in the Icom range from other receivers or transceivers, but nothing is listed in the handbook for the R75. Am I alone in wanting to extract the best quality I can out

of short wave broadcasting, even allowing for the processing used on a.m. transmissions?

I know that by now someone will be saying "Why not use d.s.p. in the i.f. to give an infinitely variable bandwidth, rather than having all these separate filters?", to which my answer would be "Have you actually listened critically to a receiver which uses i.f. d.s.p. and honestly enjoyed the experience?" I want to expand on this in a future article, but for the moment am very happy to have the opportunity to enjoy the R75 with real filtering in place - but of course it does have (optional) d.s.p. functions, so perhaps its time to investigate what these are.

The d.s.p. system operates at audio and is controlled by two buttons marked 'NR' (Noise Reduction) and 'ANF' (Automatic Notch Filter). The noise reduction seems to be a typical adaptive filter and I have to say that it works extremely well on noisy speech channels. Although available whatever the mode in use, the usual wow-wow effect is present as the filter dashes about doing its analysis, and this is most noticeable in a.m. but conversely is at its best in narrow band f.m., where it effectively drops the noise floor of the receiver when listening to weak signals.

On signals such as h.f. air traffic control - and what activity there has been on 11.175MHz for the last few days - the noise reduction is particularly effective, but of course you are listening to heavily processed s.s.b., so a bit more distortion is hardly noticeable as the background noise disappears under the influence of the filtering. The automatic notch filter is only available in s.s.b. mode (why?) and is a classic 'hunt and kill' notch which operates so quickly that it will even remove an interfering c.w. signal (that's why it's not available in c.w. mode) and track the offender even when the receiver is tuned around.

Both d.s.p. functions are excellent and I can't think of any other receiver which has such ability to dig around in the noise and recover readable audio on a communications channel. The d.s.p. processing level in the noise reduction mode is adjustable by accessing a user menu and using the main tuning knob to set the required level. The receiver remains in full operation during the adjustment so you are fully aware of the effects. Clever use of a background menu function I think.

Main Display

Back to the display - selection of a.g.c. fast and slow is shown, with selection by toggling from another little soft touch button. Holding the button down for a second or so switched off the a.g.c., and this is also shown in the main display. The a.g.c. action is very good, with time constants well chosen, but it's a pity that backing off the r.f. gain control when using slow a.g.c. results in the receiver taking some time to recover when the gain is whacked up again. Indicators are also provided to show the selection of a front-end attenuator, wisely chosen at 10dB, rather than the all or nothing 20dB sometimes encountered.

Two other front-end functions are a 10dB preamplifier intended to be used anywhere in the receiver's tuning range, and a rather excessive



16dB preamplifiers listed as being provided for frequencies above 21MHz where bands should be relatively quiet and a bit of front-end lifting can be useful. However, as our elderly garden helper said when we moved house to our current hill top location "If ees got the views, ees got the wind". I'll modify that to "If ees got the gain, ees got the noise" and I'll explain that at some future date. Finally, and usefully, the two antenna inputs on the rear panel, one being a low impedance coaxial input, the other a nominal 500Ω input for wire antennas, can be selected from the front panel, with indication of selection shown on the display.

The bar graph 'S' meter is calibrated from S1 to S9+60dB, and as my measurement results will show, the calibration is very good, and what's more it's consistent across most of the tuning range, falling off a bit at the very extremes below 100kHz and above 50MHz. The 'S' meter clearly shows the action of the r.f. gain control pedestal, and also has a peak hold facility for the last bar of the signal indication which relieves your brain from trying to assess the actual peak level of a rapidly bouncing s.s.b. signal.

If using the all mode squelch system, a single bar on the 'S' meter shows the setting of the squelch control, so you can say to yourself "I don't want to hear anything less than S7" and set the squelch to that level on the meter. Simple and effective. In fact, the main display is used to extremely good effect in keeping the operator fully informed about every setting of the receiver, and a quick look across the display will tell you all you need to know.

The only thing which seemed strange to me was the use of the r.f. gain control - but I'm delighted of course that Icom have provided the facility. Why was it strange? Because the same rotary control is used for both r.f. gain control and squelch setting, and maximum r.f. gain is not at full clockwise rotation but at 12 o'clock. There are three modes of use: when



used as a squelch control on its own, the r.f. gain is set to maximum by the receiver and the rotary control used for squelch setting, with the useful bar reminder in the 'S' meter display showing the signal level at which the squelch will open.

In dual mode, the r.f. gain increases with clockwise rotation, but further rotation eventually operates the squelch. Sounds odd, but when monitoring communications channels it works really well. Finally, the squelch function can be switched off altogether, but the r.f. gain control is still only operational from fully counter clockwise to 12 o'clock. I was caught straight away with this when I first switched on the R75, whacked the r.f. gain control to full rotation and then scratched my head as to why the receiver was totally silent. I eventually read the handbook and found out that I had set the squelch level to S9+60dB. Foolish youth.

Storing Stations

It stands to reason that if you have a receiver with the performance and facilities of the R75 you will want to find interesting stations and store them for future reference. The R75 has 101 memories, all storing frequency, mode (including filter bandwidths), preamplifier setting, attenuator on/off, antenna selection, a.g.c. setting and an eight character name tag which pops up in place of the frequency in the main display (if you wish).

Two of the memories are also used for storing

Continued on page 45...



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...continued from page 43

band edges between which the receiver can be set to continuously scan, and these memories also have the name tag facility. Scanning the memory channels under squelch control is truly easy, and there are two scanning speeds to choose from, the fast rate being astonishingly effective in covering a large number of channels in a short time, whilst being sharp enough to stop instantly on an occupied frequency.

Transfer between memory and v.f.o. operation is by a single button press, and as usual when a frequency has been recalled from memory, the receiver can be used to tune away from it without losing the original memory contents. Listening to several Shanwick control frequencies with the scan running, the R75 followed the aircraft when advised to change frequency, and I never missed a single word of the traffic.

And there's a clock, a timer, a remote control for a tape recorder, an RS-232 control for a PC, and the necessary control lines for using the Icom CI-V system interface with other Icom transceivers and receivers - is there anything which Icom didn't provide with this receiver? Not a lot, but the carrying strap is an extra, and I suspect some of the accessory crystal filters at 455kHz may be a bit expensive, but at least they're proper filters and sound nice.

Now you may be wondering when I'm going to discuss the r.f. performance and the formal measurements, but time is short, and I'm going to hold these over to another day. Suffice to say that the measurements are very satisfactory, and if you feel the need for a new receiver, don't wait for the figures to confirm what I have already said - get along and enjoy.

Well Done Icom

Time to summarise: The R75 carries the reputation of Icom a further step along a well trodden path. In one smallish package you get a receiver covering 30kHz to 60MHz, with all mode reception, and extreme ease of use. I'm particularly delighted that Icom have chosen to achieve receiver selectivity by classic analogue filtering, which has also provided pass band tuning and variable bandwidth without compromising the good sounding audio. By then adding an audio d.s.p. system with automatic notch filtering, something which has previously needed external add-on units, Icom have expertly satisfied the needs of both broadcast and utility listeners.

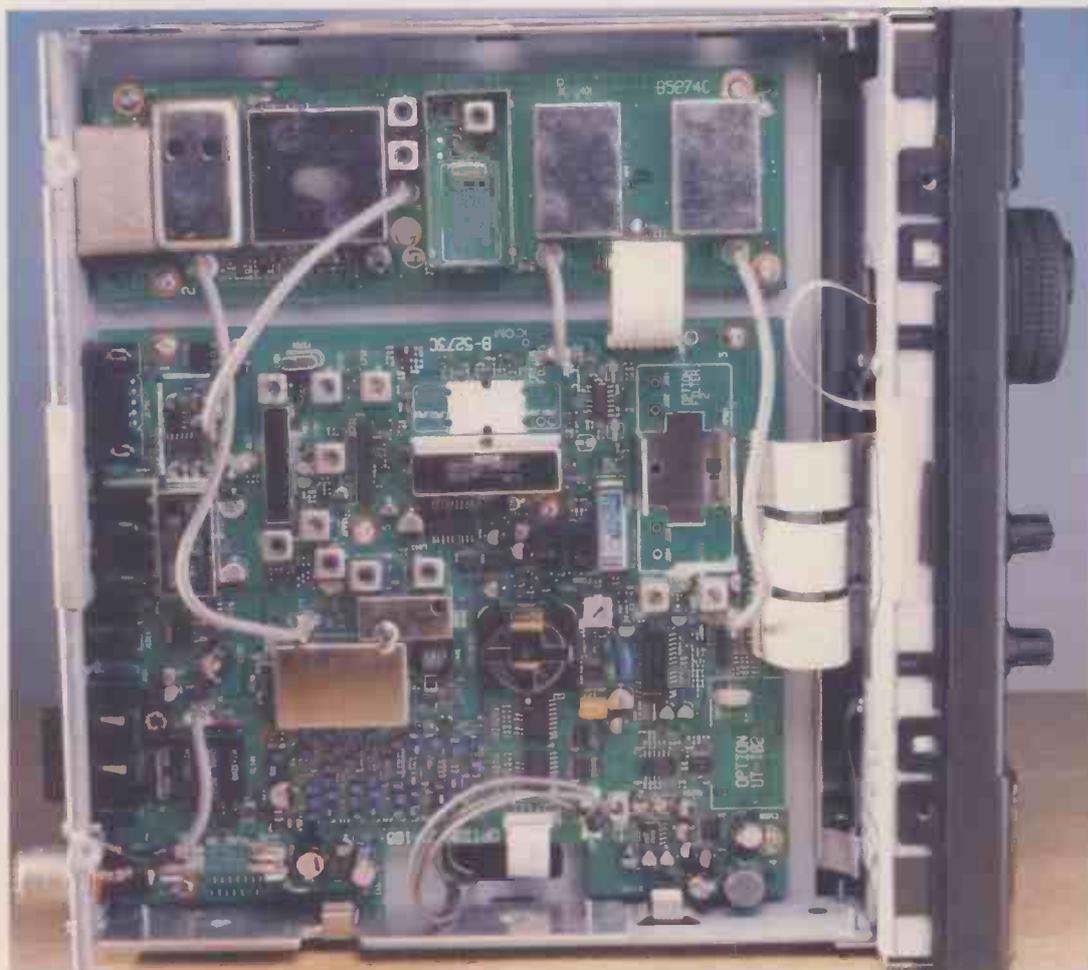
Used in anger whilst in my hands, there was little I could not resolve, even in poor conditions, and I did direct comparisons with my own favourite receivers to

verify this. For a complex piece of electronics with many facilities and options hidden behind user menus, the R75 is remarkably easy to programme - it has to be if I can do it.

I tried hard to find something I didn't feel completely at home with, but it's very difficult with such a well developed receiver. I would like to have the option of 6kHz crystal filters for the keen a.m. listener, and I found the synchronous a.m. system so unobtrusive in operation that it was hard to notice any dramatic improvement on deeply fading signals - and it doesn't have the selectable sideband facilities provided on some other receivers.

My old observation about the dumbed down nature of the operator's manual can be levelled at most manufacturer's products these days, but I suspect it's the general public who have been dumbed down to a level where they couldn't understand even a modestly technical manual without studying it for an NVQ. Did you hear the recent news report that one in three of the British adult population couldn't work out the area of a room from its dimensions and that as far as adult literacy and numeracy are concerned, the UK is ranked ninth in Europe. Thank goodness that the readers of *Short Wave Magazine* fall into the top sector, otherwise I might ask why I bother to do these reviews at all. Sorry, I've just fallen off my hobby horse, and that's the nearest I can get to a pun this time around.

The R75 deserves to sell in its thousands, and I can't praise it too highly. Well done Icom, and thank you to **Icom (UK) Ltd., Sea Street, Herne Bay, Kent CT6 8LD, Tel: (01227) 741741, FAX: (01227) 741742, E-mail: icomsales@icomuk.co.uk web: <http://www.icom.co.uk> for trusting me with an early sample so that I could have all this fun.** **SWM**



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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.

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For those who would like a top range receiver but like the layout and feel of a

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ARA 40

Technical performance

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

£139

ARA 60

Technical performance

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

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Technical performance

Frequency range	50-2000MHz
Output impedance	50-75 ohms coaxial
Gain	19dB -1000MHz 16dB -1400MHz 16dB -2000MHz
Noise figure	1.5-2dB -1000MHz 1.8-2.5dB -1500MHz 2.5-4dB -2000MHz
3rd order IP	+35dB typical
Output impedance	50-75 ohms coaxial
Connector standards	N type connector at the antenna. BNC male connector to the receiver
Power supply	12V DC at 160mA DC. Power supply for 230V AC is delivered comes with the antenna
Dimensions	Length 450mm. Diameter 90mm
Weight	2kg
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Written quotations available on request



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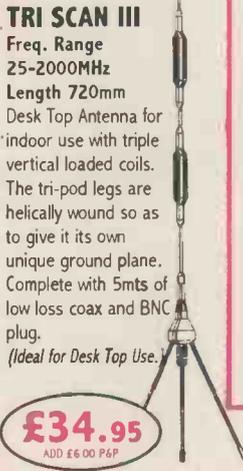


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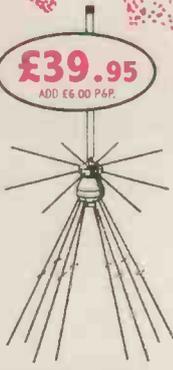
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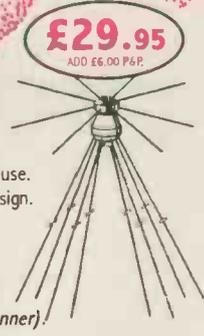
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Freq. Range 0.05-2000MHz
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Transmit 144 - 146 MHz gain 2.5 DBd
430 - 440 MHz gain 4.5 DBd
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Freq. Range Receive (0-2000MHz)
Transmit (144-146 MHz) Gain 4.00Dbd
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Same as Super Scan Stick but with extra gain, makes it an even better antenna for the amateur and expert alike. *(Ideal for the Ham Radio user)*

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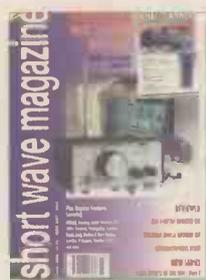
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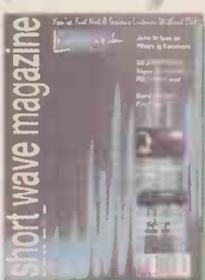
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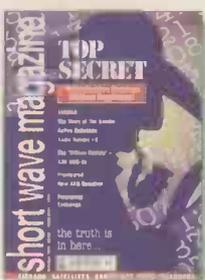
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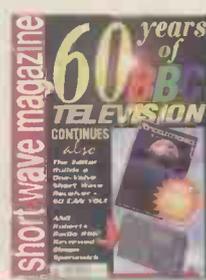
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Wire Antennas

The Mechanical

Joe Carr

K4IPV picks
up where he
left off last

month,
looking at the
all important,
and often
overlooked,
physical
attributes of
an antenna
installation.

Support Rope

The support rope selected should be large enough to provide support, but small enough to fit through the holes of the end insulators. Cotton rope is singularly unsuited to this task as it weathers poorly and will rot through in short order. Nylon rope, sail rope or 'parachute' cord are perhaps the best types, especially if a particular lot has been tested for high tensile strength.

End Insulators

End insulators come in a large variety of shapes and sizes (I've even seen one chap use old toothbrushes, suitably drilled of course). The main categories, however, are represented in Fig. 2.6. The version in Fig. 2.6a is the standard form, while that in Fig. 2.6b is an 'egg insulator'. The egg insulator has two sets of wire grooves and through-holes that are orthogonal to each other (only one shown). Wire passes through one hole and set of grooves, while the supporting rope passes through the other hole/groove set.

The standard form shown in Fig. 2.6a has a number of grooves cut along the body. These grooves are intended to lengthen the electrical path between ends of the insulator, and therefore serve to reduce losses in the insulator. Typical

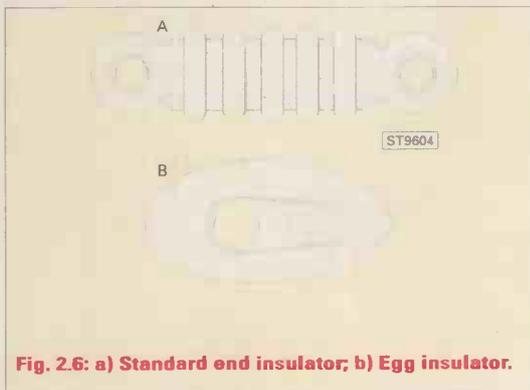


Fig. 2.6: a) Standard end insulator; b) Egg insulator.

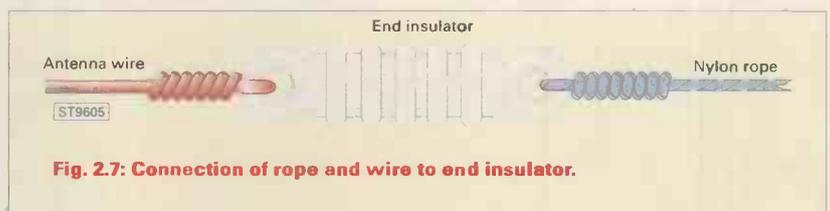


Fig. 2.7: Connection of rope and wire to end insulator.

materials used to construct insulator include ceramic, glass, Nylon and plastics.

Figure 2.7 shows the connects to the end insulator. The electrical connection to the antenna wire are the same as for the centre insulator. The only proviso here is that, for transmitting antennas, it is wise not to leave any sharp points sticking up. This end of the dipole is at high r.f. voltages, so sharp points tend to cause corona sparking. Cut off any extraneous leads that form sharp points, and then smooth the whole affair down with tinning (solder).

The rope is treated in a similar manner as the wire, but must be knotted in some manner that tends to pull together as the rope is pulled into



Fig. 2.8: Using a strain relief rope to support antenna.

Antennas - Part 2

Aspects

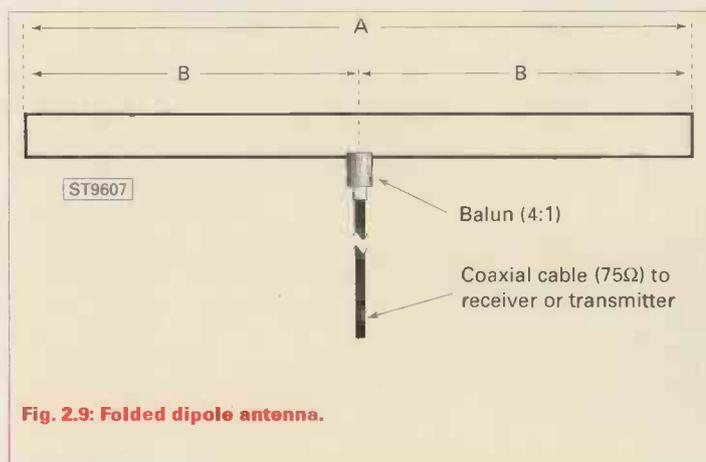


Fig. 2.9: Folded dipole antenna.

tension. Some people use the 'hangman's knot', but this seems a bit excessive (if not morbid) to me (perhaps it's a genetic memory of some obscure border Scot ancestor being hanged by an English king or two).

Antenna Strain Relief

Figure 2.8 shows a manner for strain relieving the centre insulator. This point is at the highest tension and probably is the weakest because of the number of connections and things that can break. A suspension rope is run between the antenna's vertical supports, parallel to the antenna wire. It is tied to the top eyelet on the centre insulator or BALUN by a short bit of rope about 150mm long.

The Special Case

The folded dipole (Fig. 2.9) is a special case of the half wavelength horizontal dipole. It consists of two close spaced conductors, shorted together on the extreme ends. One of the conductors is split in the centre and used as the feed point. The feed point impedance at resonance is around 280Ω, so makes a good match to 300Ω television antenna twin-lead. The usual practice is to build the entire antenna and feed line out of twin-lead. An alternative (as shown) is to provide a 4:1 BALUN transformer at the feed point to match 75Ω coaxial cable. Despite the

fact that 300Ω TV twin-lead is disappearing from the market, the folded dipole maintains a certain following among s.w.l.s and amateurs.

The problem is how to install the antenna such that the terribly weak 300Ω twin-lead wires don't break at the slightest provocation. Figure 2.10 shows a solution used by one fellow of my acquaintance (admittedly a fine worker in plastics and other materials). He fashioned centre insulator and end insulators from a piece of strong Lucite™ material.

The 300Ω TV twin-lead is prepared similar to Fig. 2.10a. The antenna element is notched in the centre (break along bottom) for about 10 - 15mm. A hand punch is used to place two or three holes in the centre insulation either side of the break. Either a large size leather punch can be used, or a paper punch. I was able to make the required holes using a hand operated paper punch, but it required a large force (and turning my hand temporarily purple...which is not its normal

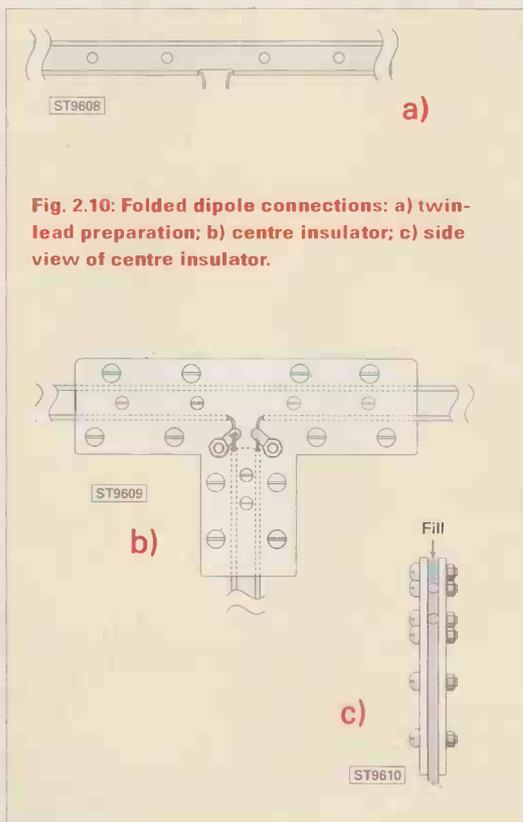


Fig. 2.10: Folded dipole connections: a) twin-lead preparation; b) centre insulator; c) side view of centre insulator.



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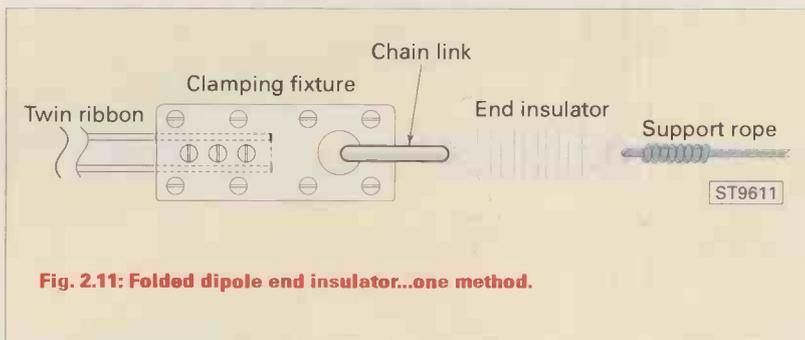


Fig. 2.11: Folded dipole end insulator...one method.

colour outside of hospital emergency rooms).

The centre insulator is shown at **Fig. 2.10b**. It is made from a piece of strong plastic, Lucite or other insulating material. Two identical sections, front and back, are needed. A number of 5mm holes are drilled into both pieces at the points shown to clamp the twin-lead. A pair of solder lugs are provided to

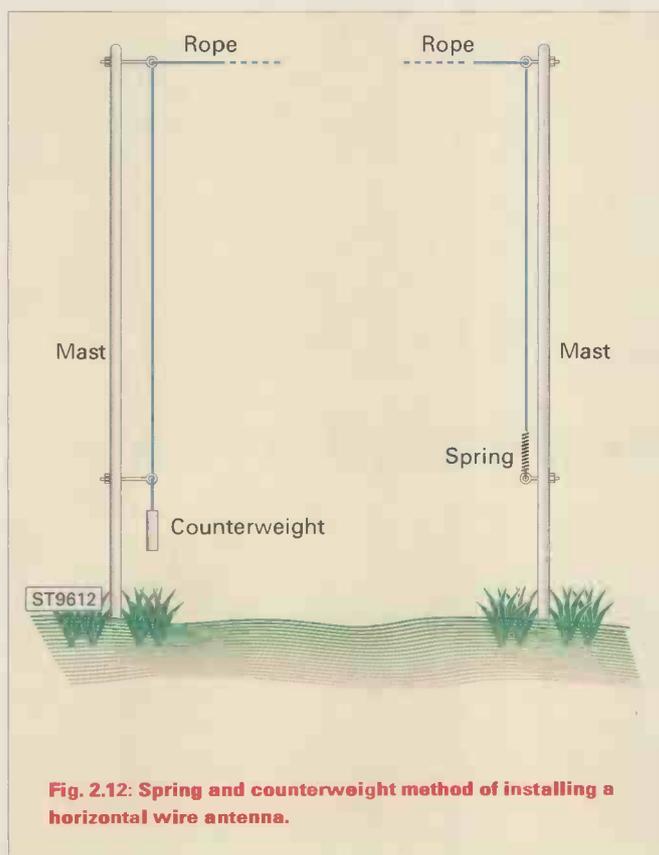


Fig. 2.12: Spring and counterweight method of installing a horizontal wire antenna.

make connections between the antenna element and the transmission line (either twin-lead or leads from a BALUN). The screws and nuts used to fasten the two halves of the insulator are made of Nylon to prevent interaction with the antenna.

A side view is shown in **Fig. 2.10c**. Note that the twin-lead causes a gap that can catch water. It also makes it possible to break one or both insulators by over tightening the nuts. In order to prevent this a gasket of similar material is glued into the space as filler.

If you opt for a BALUN transformer, then it can be wired to the down leg of the 'T' insulator, using the holes that would normally clamp the twin-lead transmission line.

An end insulator for twin-lead

antennas is shown in **Fig. 2.11**. It is constructed in a similar manner to the centre insulator. Two scenarios are possible. The first, and the one used by my friend, is to make the end clamping fixture from metal such as 3 to 6mm brass or copper. The ends of the antenna wires are shorted so this is not great problem. An end insulator is then used with a rope in the normal manner (discussed earlier). A chain link section is used to fasten the clamping fixture and the end insulator. I attempted this using a nylon chain link, about 38 x 63mm, from a DIY hardware store. It was only with a bit of difficulty that the ends were pulled apart, slipped into both the end insulator and the clamping fixture and then re-closed...too much trouble if you ask me.

The second approach is to make the clamping fixture out of the same material as the centre insulator. It then becomes the end insulator, so the other end insulator and that cursed chain link can be ignored. If you opt for this approach it is a good idea to smooth and polish the rope hole on the clamping fixture to prevent chaffing the rope.

Masts & Other Supports

The end supports of the antenna can be anything that provides height: a mast, a tree, or the roof line of a building. **Figure 2.12** shows the use of masts, but either of the other forms of support can be used as well. The support rope is not tied off at the top, as is true in all too many installations, but rather is brought down to ground level. This approach facilitates raising and lowering the antenna for maintenance and tuning. Be sure to provide enough 'dead slack' to make lowering the antenna feasible!

The antenna support rope is connected to a spring on one end and a counterweight on the other. The spring should be stout enough that it is only slightly extended when the full weight of the antenna places it in tension. I've used door springs, but only of the stoutest varieties.

The counterweight should be just enough to balance the weight of the antenna and keep it not quite taut. As wind moves the antenna up and down the counterweight raises and lowers, thereby reducing the chances of straining the antenna wires to their limit. Any number of counterweights can be used. I've seen a number of types: drapery cord weights, a small bucket of rocks, a gaggle of fishing weights, and (in one case) a burned out starter motor from an automobile (the mounting hole on the front boss of the motor was ideal for accepting the rope).

Figure 2.13 shows two methods for making the connections at the top of the mast. Although egg insulators are shown here (for the sake of fairness...standard forms were shown earlier), either form can be used. A pulley is mounted to the top of the mast using a link section and a stout eyebolt

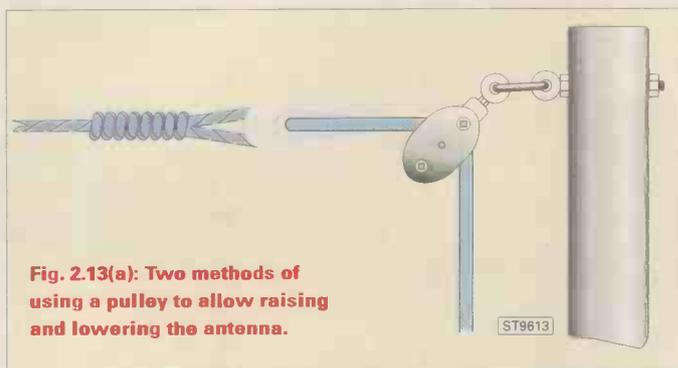


Fig. 2.13(a): Two methods of using a pulley to allow raising and lowering the antenna.

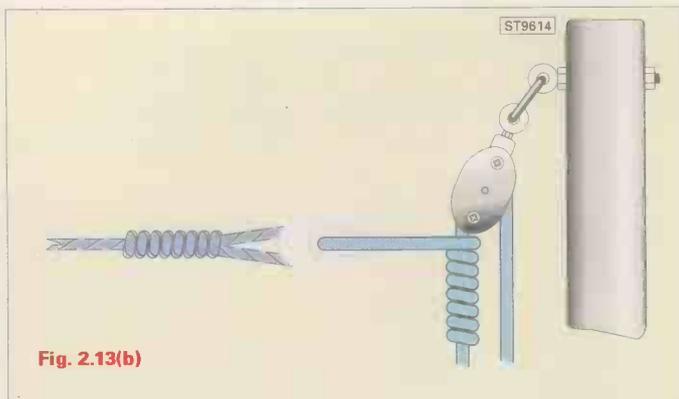


Fig. 2.13(b)

they fail, they don't work well and the rope gets stuck. They can also corrode rather badly, with the same end result. All in all, a pulley is not the best solution for most people.

Figure 2.14 shows a better way. In this approach a U-bolt is fastened to the top of the support mast. If the U-bolt is made of brass, then all the better, for it will not corrode. The rope can be passed through the U-bolt in a manner similar to the pulley system...but without the mechanical failure problem. Be sure to install the U-bolt all the way up

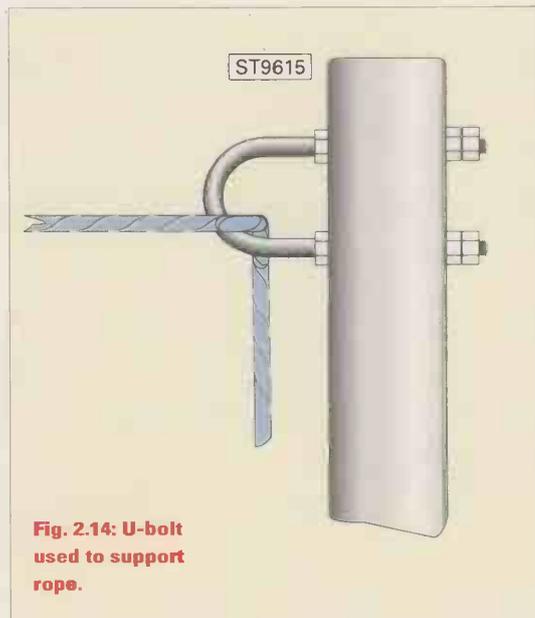


Fig. 2.14: U-bolt used to support rope.

to the threads so that the rope will not chaff against them.

The method shown in **Fig. 2.15** could only be used by a horse lover. In the early 1960s I knew a ham operator who lived in the Piedmont section of Virginia near Middleburg. This area just east of the Blue Ridge Mountains is called the 'Virginia hunt country' and is the home of many 'white fence

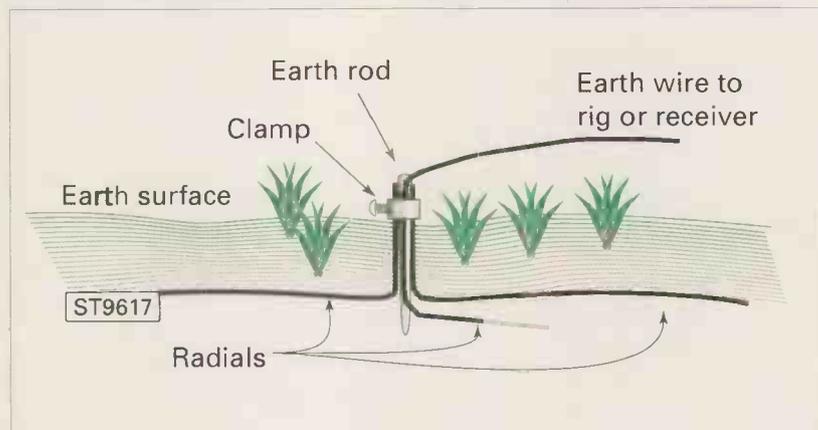


Fig. 2.16: Earth rod connections.

that passes through the mount. In the case of a tree I've used a steel band of the type used to mount TV antennas to house chimneys. By making the down rope a closed loop you gain the ability to raise and lower the antenna. But don't let a loose end slip...or you'll be chasing the rope up the mast as it slips through the pulley!

Pulleys work nicely, but are mechanical contraptions that tend to fail occasionally. When

farmers', i.e. gentleman farmers (according to my paternal grandmother, who grew up on a working farm in that area in the 1880s, "real black-dirt farmers don't have the time or money to paint a fence white or any other colour"). It is said that 20 percent of the privately held wealth in the USA owns estates in that area.

The method shown in **Fig. 2.15** uses a brass stirrup in place of the U-bolt. If you've switched to motorcars, and no longer need your stirrup, then perhaps this is a viable means of attaching the support rope to the top of the mast!



Fig. 2.15: A method for a horse-lover's antenna.

Ground System

Figure 2.16 shows a good way to connect the ground wire from the transmitter and receiver. Not shown is the lightning arrester which ought to be installed in the line outside the building. A ground rod, preferably 2 to 3m long and made of copper-clad steel, is driven into the ground to within a few centimeters of the top. The ground wire from the rig is connected to the ground rod using a wire clamp (which usually comes with the ground rod). If radials are used, then they are also fastened to the ground rod using the same or a different clamp.

Conclusion

Antenna installation need not be a terribly difficult affair if you use good practices. Please give these methods a try!

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Paul Beam,
stuck with a
small plot and
no h.f.
antenna,
takes a long
look at a small
and likely
solution - the
Wellbrook
active loop
antenna.

The amplifier is located at the base of the loop in a wiring conduit box containing epoxy filler. For long term outside use, don't forget to waterproof the BNC connection.



Having recently moved into a terraced house in a city centre location, and being blessed with a veritable postage stamp sized 'back yard' (or should that be metre Ed?), I was at a loss as to what on earth to do about an antenna for h.f. My v.h.f. arrays caused me no problems whatsoever, but just how do you get 20m or more of wire into a space less than half that size?

Well, my dilemma was short-lived when the opportunity arose to check out the ALA 1530. It is claimed that this antenna was designed with the small urban garden in mind and that the focus was on keeping the relatively high noise level found in urban areas to a minimum. The ALA 1530 can be used indoors, but outdoors is recommended. The antenna is fully protected against the elements.

Well Packed Wellbrook

When the '1530 arrived I was very impressed as to how well the transit packing had been thought out. It seemed to me that it would resist all but the most concentrated efforts of any courier company to damage it. All bar actually running it over that is. The 1m aluminium loop is shipped fully assembled and was wrapped in high density foam, the Head Unit at the bottom of the assembly was protected by a sturdy box. The whole antenna was strengthened with a cross member for delivery. Wellbrook had certainly thought through the problem of shipping such an awkward shape to their customers.

What You Get

The ALA 1530 active loop antenna consists of the following, a Loop Head Unit, an Antenna Interface and a 12V regulated power supply. The Head Unit is made from a 1m diameter aluminium tubing loop with antenna amplifier enclosed in a uPVC enclosure, at the base of the assembly which duals as a mounting point - though it has to be said, I've still not permanently mounted the antenna, even after a three month period of use, see the photograph for my mounting method.

The amplifier enclosure is stabilised against UV radiation (sunlight) and is filled with epoxy resin to form a very rigid structure with the loop. BNC connectors are provided to connect the Head Unit to the Antenna Interface. The Antenna Interface is housed in a grey ABS box and is used to provide the 12V d.c. supply to the loop via the feeder cable. A 1m cable terminated with a BNC connector is provided for connecting the whole affair to the receiver.

The Antenna Interface also has a 315mA fuse to protect the power supply and other components against accidental feeder cable short circuits. A 2.1mm coaxial connector is provided for the power supply input. Additional filtering is used to reduce low frequency power supply noise. A feeder



Even here with a plant growing through the middle, the ALA 1530 is a great performer. I didn't notice any measurable difference with out the horticulture so this is where it ended up. Note the paving slab supporting the antenna.

isolation transformer and an r.f. choke are provided to reduce common mode coupling of mains borne/power line noise from the receiver and the Loop antenna power supply. The 12V regulated power supply is an Altai 13A plug type unit. For use outside the UK and Ireland, the regulated power supply is provided by the user. The recommended feeder cable is RG58c with the maximum length not exceeding 100m.

In Use

During the review period, I sited the antenna in various locations around my QTH, including the spare bedroom that is my shack. Whilst indoor use does yield results, even in my computer infested home, with all the resultant radiated hash, don't consider it as a solution. Once I located the ALA 1530 outside of the electrical field of the house, generated by all that mains wiring, then the antenna really came into its own, but then you'd expect that, wouldn't you?

In fact, it didn't seem to matter where I positioned it outside, the results didn't appear to vary by a noticeable amount, though I was relying solely on my FRG100's 'S' meter for the comparison. In theory the antenna has a figure of eight reception pattern, but I was only really able to detect the presence of some fairly sharp nulls with some ground wave signals.

This turns out to be a very useful characteristic of the ALA 1530, in fact one of its most endearing. With h.f. signals of interest (to me anyway) arriving via the ionosphere, there seems to be enough of a spread of direction of arrival for the Wellbrook loop not to require any rotation. Local and highly directional noise sources on the other hand, can be nulled out with ease. I'm really beginning to like this antenna. Reception at medium wave and long wave frequencies was a stark contrast to h.f., with sharp nulls offering considerable discrimination to interfering stations.

Antenna Tales

Jürgen Hemme wonders how to solve the problem of having a short wave antenna, when his landlady isn't fond of wires hanging in the air.

Consul Johnson had founded a trading company, bringing him wealth and a villa in the better part of Bremen, the old Hanse town and seaport on the coast of Northern Germany.

A park surrounded the house, and there he planted oak seedlings. He kept them at an appropriate distance, as he was a man with foresight.

All this was long past when I came to live in that house. Letting furnished rooms to students now helped the old lady to make ends meet. The trading company had ceased to exist, and the villa was dilapidated - except for the oaks, which had weathered the times and had grown into mammoth trees. Out from my window in the roof, I looked at the tall trunks, and sometimes you could smell salt in the air, as the sea wasn't far away.

I was employed part-time at a radio manufacturer's, and used to ride the tram line downtown after working hours. The Amerika-Haus provided a rich library and a place to study English language books and journals. Not too many years after WWII, their reading room became a kind of window to me, to a new, exciting world. My knowledge in electrical and radio engineering came from studying German language publications. Mind you, we had been shut off from the world and it was going to take years to learn what we had been missing. So the reading room was a beautiful experience; my vocabulary increased steadily and this in turn gave new pleasure to reading and understanding.

A New Discovery

Here I discovered a paper on 'Invisible Antennas', antennas made from very thin enamelled copper wire. Fragile but efficient, not made to last but hard to see; these were the features as I remember them. Arguments went like this: ordinary sized antenna wire was of high mechanical strength and low loss resistance, but is easily spotted and possibly found disturbing by others. Using thin wire will reduce visibility, but the antenna will become less durable, and its performance will be lower due to the increase in wire resistance.

However, as a receiving antenna, losses due to the extra resistance will be small as the currents flowing are tiny indeed.

Proposed were wire diameters of half a millimeter or even much less, just sufficient to keep the antenna up without breakage. Also, small transparent insulators made from strips of Plexiglas were recommended. Riding home, I imagined a clandestine project in which my friend Margret would play a key role.

The Antenna Tested

On the following weekend the weather was pretty awful, grey sky threatening rain but no wind; kind of ideal for what I had in mind. While the landlady was engaged in lively conversation with my girl friend, I aimed at a high branch of one of the oak trees with a stone and some fishing line tied to it. It worked fine and, with the fishing line over the branch, insulator and copper wire followed. Beautiful; there was my antenna, at least thirteen metres up. Now it was my turn to explain to the old lady that I had a little experiment in mind and invited her to inspect my innocent doings.

Sure enough, the grey sky helped to make the wire invisible and she had no objections. That single wire soon had company, both were twenty metres long, V-shaped, with a 60°NW opening, direction USA.

My short wave radio had plug-in coils for the amateur bands and two tubes, one as a regenerative detector, the other for audio amplification. Reaction was adjusted by control of the screen-grid voltage, and to get that vital sniff of positive feedback the cathode was tapped into the single tuned circuit connected from grid to ground.

Short-Lived Success

New life came into my little radio with the 'invisible' antenna. My earphones got plenty of stations from the Caribbean sea to Canada, with crystal-clear signals in telegraphy. And for the first time I heard Anchorage/Alaska - with the particular polar fading.

One fine day, however, everything was over. Whether it was Susie or Betsy I don't recall. Force eight winds had my fine copper span disappear and saved my midterm exam. What remained was the longing for those long, high-strung wires, the free horizon and the memory of crystal-clear DX signals directly from the sea. Those were good times, on the twenty- metre-band.

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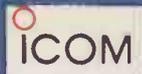
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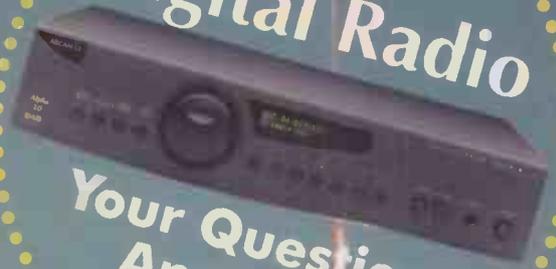
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Amateur Bands

Safety!

A boring subject, but one that touches us all, sometimes painfully. What about the antenna you will put up single-handed? Firstly, the ladder should bear on the ground equally under both feet; and secondly, when both the upper ends are also equally in contact with the wall, then the ladder should 'look' vertically upwards. Impromptu pegs round the bottom will stop that end from moving, and if possible, do lash the top end firmly.

You may want to lean out sideways from the top of the ladder. If you want to use power tools, do spend a few 'bob' on a portable Residual Current Detector (RCD). These things can detect slight earth leakage or unbalance in the current drawn from the mains, and cut the mains off in a few milli-seconds. I use mine with **anything** mains powered outdoors - lawn mower, hedgerimner, drill, iron - you name it.

You don't want to go aloft too often. So, when you put a line up for your antenna, use it to pull over *three* lines: one for the antenna, one as a preventer to take the strain when the first one breaks (it will!); and the third one tied off each side ready for the time you need to reeve a new line.

Trees move in the wind. An antenna left to choose between extending several feet or breaking always breaks and when the 'opposite phase' occurs, the thing sags, catches in another branch and again breaks. If you must use a tree, then use a pulley tied to the branch and at the bottom of the downhaul tie a weight. An old bucket with a hole in the bottom to let rainwater out does it, with just enough stones to answer. But again, take all precautions against slipping ladders or other mishaps.

Indoors, again, do check the mains wiring to the shack, particularly the safety earth. The average station r.f. earth is too high resistance to be a safety earth. So - be careful!

Letters

First a welcome back to **Dennis Sheppard** who returns with a DX-394, 40m end-fed antenna and a new QTH in Nuneaton, after being absent from the scene for some time. On 21MHz he found A71BY, JR7AQL, ZS6RU and 4X4SJ, while 28MHz produced CU7AM, EP3AR, KJ6JQ, HL3ERJ, D44BS, VK6JJ, VK6KRC, VK8AN, LU8XX, VU2JPS, VU2DK, JR6SVM, PJ8/W8EB (Sint Maartin), VE3XN, ZS6BBP, 5R8DA, Z2ZJC, Z21KG, Z32KV, 9J2BO, 9K2HJ, 8P9JA and 9H3UW, plus plenty of Russian and American stuff.

Now let's look at the other end - the list from **Colin Dean** in Barnsley. On 3.5MHz sideband, he entered A41LZ, BV5BG, EX2T, EZ8CQ, E44DX for the new DXCC entity of Palestine, HL3IUA, JA1-2-3-5-6-7, JW0L, TF3GC, UN0LE, VK3ATN, VK3DZM, VK4BER, VK6LK, 4L2M and 4L5O. As for 7MHz, Colin listened to A41LZ, A61AS, BV2RS, C33BO, EX2T, EZ8CQ, JA1UT/E4, HL4RHY, HZ1RT, JA1-2-3-4-6-7, JY9QJ, OX3SA, Pz5JR, R1FJL (Franz Josef Lan), TA2BK, TF3TF, TI4CF, UN7SW, VK6AGI, VU2EPR, YB2LAB, YB0JIV, YC5XIP and 4L0CR.

QSL Manager

From St Helena, ZD7VC wrote to **Emrys Griffiths BRS173963** in Caernarfon to ask him to pass on that he now has a QSL Manager, namely K1WY, which he hopes will ease his QSL problems. Sad how successive UK Governments have neglected this lovely place - though to be sure, if there were an airport, it would soon be turned into a tourist trap.

Now we turn to the all-c.w. log from **Ted Trowell** who has been 'left in charge' while his wife is in hospital - we know the feeling - I have been left to 'mind the shop' for three weeks while UR5CMM is with her relatives in Ukraine. Ted seems to have neglected his duty to the extent of visiting the shack (1) as on

Top Band he mentions S79XM, ZB2FK, VK6HD and EA6ACC.

Then a switch to 7MHz netted SU1ZZ, PY4KCD, 5B4AGC, EA6ZY, K3ZO, K1AR, W3LPL and EA8CN. While on 14MHz TS-LOV, ZL1MH, OY1CT, P4/K2LE, ZS6AL, VQ9QM, N6FOC, ZS1AAX and 5B4AGC came in. 18MHz yielded a lone KL7HF, but 21MHz gave 8P9DX, 5B4AGC, 4X4NJ, A45XR, P4/K2LE, 9H1EL and ZF2NT.

On 24MHz we find CO2OR, K6FG, PZ1AP, PT7AH, N6FF, TA3DD, KL7HF (RST 589 at 1510z would you believe?), NOKK in Minnesota, ZS6DM, PY2JM, VQ9QM and VU2VLH. Finally, 28MHz where XE1JZ, VK8HA, ZS6AVP, JY9QJ, YB9BON, PY1WAS, CP4BT, CO2JD, 4Z5AD, ZS6AL, ZF2NT, VQ9QM, P4/K2LE and K3TEJ/C6A were logged. **Fire** on you Ted - back to the washing-up!!

From Birmingham **John Collins** sent a cutting from the *Mirror* of February 1 which demonstrated once again how reporters can get it wrong. The piece referred to the cessation of the use of Morse for ship-shore distress working, but obviously had no idea whatever that it is used in other applications. Crowning it, the article even goes on to repeat the 'Save Our Souls' bit about the SOS call.

In fact, the first proposal in 1903 was for the use of SSSDDD, but in 1904 the Marconi Company instituted the use of CQD on all ships fitted by them. In 1906 the Germans wanted to use SOE; S was substituted for E as being less likely to be lost in static - and so 'SOS' was born!

Another one to be left to look after the shop was **Paul Woodhall** - his Allison slipped a disk so Paul was temporarily promoted to head cook and bottle-washer; alas, his work wasn't good enough, so he's demoted back to the shack!

The Top Band CQ WW DX contest, according to his E-mail, was 'last night, 27-7-99' ...*Crikey - the man's got a Time Machine!* Seriously, 2230 to just after midnight is a little early to expect WS on the band. Best DX was 3V8BB and W8RLR, the latter in QSO with GJ2D - and of course stacks of Europeans.

Paul also used his Icom R71 and MFJ tuner into a full-size G5RV plus a good earth. On the other bands; he records on Eighty E16S working PA0GTA/HI3, VE2BDC and N6RO. On 7MHz PA6V was working G0GSA, ON4CBV, PA0HBK, F5AAR/P, PI4CC and SM4AIO. Up on 14MHz ZL4IR, JK1JZQ, JA1HIA, JA1GKA, JH3SIF, JA5BEN, VK2ARR, EA7BA, VK7KHJA3BOA working Europeans, TU2DP and JA2TVM, while EA30T was after VK6MZ and V63KU attended to his pile-up.

KL7AH was also dealing with plenty of EUs. Perhaps most important on this band E44B for the new Palestine entity. Turning to 21MHz 4X4s and Ws of course, 9A3AA working a large pile and EW4MM likewise, W1MDS, CO2CW, W6EUF, 6W1HM, and - I like this one - OH6KVF/P QTH Malax, sat in an igloo while working F5FG/P.

Coming - Or Going?

An ARRL *DXCC News Release* dated February 18 indicates that Burundi 9U operations since 1994 have all been shown to be phoney licences. DXNS dated February 23 indicates that the following are affected: 9U/F5FHI, 9U/EA1FH, 9U5W, 9U5DX and 9U5CW. Another sad bit of news is that Andy, YO3AC became a Silent Key on February 7. Bill Moore NC1L has taken over from K5FUV on the DXCC Desk and he writes in DXNM that the current turn-around time is on the order of ten weeks.

Problems

LA4BN, President of the LA DX Group, says that the Norwegian Polar Institute's proposed new legislation will make it difficult, or even impossible, for DXpedition activity. He invited DXers to support him in his protests. Although the deadline set will have passed by the time you see this, I'm sure your support will still be appreciated. You can still FAX support to Raider on + 47 2227-5620, or E-mail: rboe@2ci.net

Finito

That's it for another issue. As usual, I want to see all your letters, whether to PO Box 4 Newtown Powys SY16 1ZZ or by E-mail, to reach me by the start of the month.

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Eclipse

As most people in the UK will already know, there will be a spectacular solar eclipse visible across the southwestern areas of the UK during August. The eclipse takes place on Wednesday 11th August, and the centre of the track of the total eclipse crosses Cornwall from just north of St. Just in the west, to Falmouth in the east.

Although total eclipses are quite rare, there is a massive amount of publicity surrounding this event. The last one visible from the UK was during the 1920s, and the next one won't be until 2090, 23rd September 2090, (if you'd like to make a note in your diaries!). If you don't see the one this year in the UK, then you have a long wait for the next one!

So what has this got to do with radio, I hear you ask? Well, now is the time to start planning what you are going to do during the eclipse period. The darkening of the skies during an eclipse gives rise to some odd propagation conditions, and the rarity of eclipses means that these events and conditions are not studied very often. Although the total eclipse lasts for slightly more than two minutes, there is a gradual darkening of the skies for over one hour either side of this period.

The eclipse will be visible across the whole of the UK (weather conditions permitting!), ranging from about 80% coverage of the Sun in the far north of Scotland, 96% coverage in London, 99.5% in Bournemouth (near where the SWM offices are located), and 100% in Cornwall and parts of Devon. If there is thick cloud cover on the day, the eclipse may not be visible, but radio signal propagation conditions will be affected.

The unusual propagation conditions will be similar to those along the grey-line paths at sunrise and sunset. But since the eclipse takes place during the day, you should be able to hear signals from stations which are only active during the day.

If anyone is planning to do any radio propagation experiments during the day of the eclipse, I would like to hear about it. For more information about this eclipse, see <http://www.hermit.org/Eclipse1999> on the Internet.

Military SELCALs

The recent item about SELCALs in USAF aircraft has prompted a letter from **Les Griffiths**. He suggests that the answer may be something to do with the Civil Reserve Aircraft Fleet (CRAF), and he sends details of a logging to support his idea.

In the CRAF service there are about 45 US airlines who contribute passenger and freight aircraft into a pool so that the US military can call upon them in times of need or emergency. Most of the time, these aircraft fly as normal civil airliners, but the airlines agree to provide them at short-term notice. The last major use of the CRAF fleet was in 1990/1991 when almost the entire fleet of aircraft was used to transport troops and equipment into the Gulf region during the build-up before *Desert Storm*.

As these CRAF aircraft are standard freight and passenger airliners in most respects, they maintain their normal civilian avionics - including their airline SELCAL black boxes. Therefore, it is probably no surprise that the crews continue to use their SELCAL equipment as they fly around the world on military contract or CRAF flights. While on a CRAF flight, they are authorised to use the usual GHFS frequencies, and quite often you can hear an aircraft asking a GHFS operator for a SELCAL check (and being denied, because the GHFS stations do not have SELCAL sending equipment).

As an example of a CRAF flight, Les says that he logged Reach 7412 on 11.344MHz reporting their departure from Sigonella in Italy, flying to Detroit, Michigan. The flight asked for a SELCAL check on DF-EG. Checking this SELCAL in the books, shows that this is a DC-8F freighter aircraft belonging to American International Airways.

Actually, this could be either a CRAF flight or a military

contract flight, but the difference is insignificant. I am not sure that the frequency is 100% correct, as I have no record of 11.344MHz being used by airlines - maybe it was Stockholm Aeradio on 11.345MHz.

There is a list of participating airlines on the Internet at <http://www.fas.org/man/dod-101/sys/ac/craf.htm> Although the list is a few years old, it has not changed much, and it does give some useful background information to the operation.

Les also reported another military flight with a SELCAL, but says that he was unable to find any details of the aircraft involved. He heard flight Spar 06 working Gander ATC on 5.616MHz using SELCAL AJ-KP. Les comments that this is close to a batch of known RAF/ASCOT SELCALs.

I think that I already know the answer to this question. There is a USAF VIP transport C-135 (similar to a Boeing 707) which is equipped with a SELCAL, and is a regular user of the Spar 06 callsign. This is an aircraft with the tail-number of 61-0327, which is operated by the USAF Central Command from MacDill AFB in Florida - my listing shows a SELCAL of AS-KP for this aircraft, but it could be a typo by me or Les, or a mis-read by the aircrew or Gander ATC operator.

More SELCALs

On the subject on military SELCALs, I now have a list of about 20 codes being used regularly by KC-10 aircraft, and I have also personally heard two KC-135 Stratotanker aircraft with SELCALs, and also two C-17A Globemaster III aircraft requesting SELCAL checks.

The KC-135 loggings are the most surprising of the three. The KC-135 design is quite old, and even the youngest airframe is in its mid-30s. They have had lots of modifications and updates over the past 30 years, and I am surprised to hear that some will be upgraded with SELCAL equipment.

This project is known as Pacer Crag, and involves upgrading most of the aircraft avionics. As a result, the flight-crew is being reduced from three to two, as there is need for a navigator. To allow the crew to maintain contact with ATC stations via h.f. without the need to constantly monitor a h.f. radio, the aircraft are being equipped with SELCAL equipment.

The original reports for the Pacer Crag project mentions that over 600 aircraft would be converted (does anyone know where to get 600 SELCALs?), but I have heard recently that this figure may be reduced due to funding issues. A report in early 1999 mentioned that over 40 aircraft had already completed their Pacer Crag modifications.

Whatever happens, there will be a large number of new SELCAL codes in use around the world. For those who collect trivia, the CRAG part of the programme stands for Compass, Radar and GPS.

AirNav Update

A recent E-mail from **Andre Brandao**, author of the *Airnav* aircraft tracking program, says that he is currently beta-testing version 3.0 of the program, and it should be available during the summer. The new version will contain some very interesting features for those of you who use ACARS decoders such as *Airmaster*, *SkySpy*, *WACARS* or *KRACARS*.

His E-mail also mentions Internet tracking, but I am not too sure exactly what this will cover. As ever, the new version (when testing is completed) can be downloaded from the *Airnav* web-site <http://www.airnavsystems.com>, however, until then it is still worth getting a copy of the 2.11 version.



This map shows the path of the total eclipse in the region of the Channel highlighted, the centreline of the total eclipse is shown in red.

Letters

Walter Blanchard writes with details of his experiences in listening to s.s.b. utility stations from New Zealand while he was on holiday there during the first few months of the year. He was using a small Panasonic B65 with just its simple telescopic antenna, and was able to pick up the VOLMET broadcasts from Shannon Aeradio on 8.957MHz, and also on 5.505 and 3.413MHz at times. These were all received during the late afternoon and early evening (local time in NZ).

Walter has discovered one of the benefits of countries like New Zealand have for DXing. There are very few strong local broadcasts to cause interference, and the country is ideally situated to make the best of propagation conditions from Europe.

Walter also commented on the recent changes to the RAF VOLMET service on 5.450/11.253MHz. This column in last month's SWM should provide the answers to your questions.

All At Sea

Maritime Safety Information (MSI)

The dissemination of Maritime Safety Information (MSI); for example, gale warnings, weather forecasts, details of wrecks, changes in position or non-operation of navigation aids (buoys, lighthouses, etc.), has always been of paramount interest to the mariner. In 1977 the International Maritime Organisation (IMO) set up the World-Wide Navigational Warning service (WWNWS), dividing the world into some sixteen NAVAREAs. Each area has its own co-ordinator who obtains the MSI from National Co-ordinators and then forwards it to the appropriate coast radio station for transmission.

NAVAREA I (East Atlantic, North Sea and Baltic Sea) covers the area ranging from 71°N to 48°27'S and from 35°W to the most easterly limit of the Baltic Sea. The NAVAREA I co-ordinator is situated one floor up from my office, and is on duty 24 hours a day to deal with any urgent information concerning the Safety of Navigation at sea.

With the advent of radio it became possible to communicate this MSI information to ships, speedily and on a regular basis. This service was performed initially by Morse code, and subsequently by radio-telephony by coast stations at regular times of the day on the coast station working frequency or channel, necessitating a trained Radio Officer to copy the broadcasts. Under the new regulations of the Global Maritime Distress and Safety System (GMDSS), an automatic system was required, enabling the trained RO to be dispensed with. This new system was called NAVTEX, and from 1 August 1993 all passenger and cargo ships of 300 gross registered tonnes and over were required to carry a dedicated NAVTEX receiver.

NAVTEX

The NAVTEX system was first put on trial in Sweden in 1977 and proved to be so successful that, in 1979, countries bordering the Baltic Sea established the first NAVTEX network. It has the great advantage that the information is received and printed automatically and does not need to be monitored at the time of transmission by a Radio or Deck Officer. The United Kingdom became involved in trials in the North Sea in 1979 using the BT Coast Radio Station, Cullercoats Radio. In 1983, broadcasts began from Portpatrick Radio, and in 1984 the service was extended to Lands End Radio. In 1985 the Lands End service was transferred to Niton Radio on the Isle of Wight.

Today the whole of NAVAREA I is covered by sixteen stations, Bodo, Vardo and Rogaland in Norway, Harnosand and Stockholm in Sweden, Reykjavik in Iceland, Tallin in Estonia, Murmansk and Arkhangel in Russia, IJmuiden Coastguard in the Netherlands, Oostende in Belgium, Corsen (Brest) in France, the three in the UK and Valentia in Eire. Similar networks have been established in other parts of the world to serve other NAVAREAs. NAVTEX is now an integral part of the world-wide GMDSS.

In NAVAREA I, broadcasts are made every four hours throughout the twenty-four hour period, and are arranged so as to not overlap. Messages are preceded by a coded preamble comprising four letters, B1, B2, B3 and B4. B1 is the broadcasting station identification, e.g. Niton 'S' and 'K', Reykjavik 'R' and so on. The B2 character identifies the subject matter, which is about to be broadcast and is chosen from the following list:

A	Navigation Warnings
B	Meteorological Warnings
C	Ice Reports
D	Search and Rescue
E	Meteorological Forecasts
F	Pilot Service Messages
G	Decca Warnings
H	Loran Warnings
I	Omega Warnings
J	Sat. Nav. Warnings
K	Other Electronic Navaid Warnings
L	Additional Navigational Warnings
M-Y	Not Allocated
Z	No Messages on Hand

B3 and B4 characters are serial numbers up to 99 and are separately maintained for each station (B1) and each category (B2). The broadcast language is English but provision has been made for broadcasts in other languages; for example, for use by national fishing fleets and leisure craft, and for countries wishing to broadcast in their own language (e.g. Japanese, Chinese, etc.).

The NAVTEX transmission is single channel FEC (SITOR B) running at 100baud with a 170Hz shift on the frequency of 518kHz. Transmitter power output is usually in the order of 800W to 1kW, depending on the area where the transmitter is located. It can be received on an ordinary communications receiver with an appropriate decoding package, but for marine use, and to obtain maximum benefit from the system, a dedicated receiver is required.

These dedicated receivers are designed either to print out the message on a 'cash-roll' type paper, or to display the message on a small liquid crystal display v.d.u. The receiver is left permanently switched on and has storage facilities so that it can be left unattended until time permits the Deck Officer to read the warnings. By using the coded preamble, the receiver can be programmed to print broadcasts from a particular station or stations only, as identified by the B1 character, depending on the route being taken by the vessel. Also the nature of the warnings required as identified by the B2 character can be selected. The serial numbers of the transmissions are recorded so that repeat broadcasts are ignored except for those prefixed with '00', which identifies them as urgent messages. These will always be printed whether or not they have been previously received, thus ensuring very important broadcasts such as Search and Rescue are not missed.

The range of the NAVTEX transmitter is usually in the order of 200 to 400 nautical miles to cover Sea Areas A1 and A2, depending almost entirely on ground wave propagation, although problems are occurring with interference in NAVAREA I, caused by the NAVTEX transmissions from Miami Coastguards! This is probably due to the Americans using 8kW from their transmitters when in actual fact the power should only be 1kW maximum! In normal circumstances the emitted power should be kept to the absolute minimum required to cover the appropriate geographical area. This then prevents corruption in any neighbouring station's broadcast, but even then transmissions can be copied over vast distances during darkness. Allocation of B1 characters, regulation of transmitter output powers and timing of broadcasts are all supervised by the International NAVTEX Co-ordinator who is also resident here in the UK Hydrographic Office.

Although 518kHz is the accepted international frequency for NAVTEX transmissions, provision has been made for national language broadcasts on 490kHz, and a back-up frequency of 4.2095MHz has been allocated to cater for tropical latitudes where the incidence of tropical storms is high and static levels can cause severe interference on 518kHz.

Dissemination of MSI in the United Kingdom, as I said earlier, is controlled by the NAVAREA I Co-ordinator situated in the United Kingdom Hydrographic Office. Navigational information is fed into this central point and the co-ordinator then decides the priority and broadcast schedule. The completed broadcast is then forwarded to NAVTEX control at Stonehaven Radio where it is input into the specialised computer system which controls the NAVTEX transmitters at Niton, Portpatrick and Cullercoats. Information is also forwarded to Oostende Radio to cover UK blind areas. Broadcasts then take place at their designated slot times.

Full details of world-wide NAVTEX transmissions including broadcast content and times can be found in the *Admiralty List of Radio Signals, Volume 3, Radio Weather Services and Navigational Warnings* and *Volume 5, Global Maritime Distress and Safety System*.



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Scanning

A few months back I promised that I'd try to find time to install *Trunker*, a totally free trunk tracking program compatible with Motorola SmartNet-type trunked radio systems. Well, a week or two ago I finally managed to prise myself away from my normal work long enough to do so, and have to report that I am totally and utterly addicted to this program.

Trunker is, as I had originally thought, something of a nightmare to install and set up - it took me nearly a whole day to figure out what needed to be done and how to do it. The end result was very much worth the effort, though, simply because once you've set it up, *Trunker* does a marvellous job.

Monitoring & Decoding

Unlike the Optoelectronics Optocom or OptoTrakker, *Trunker* works by actually monitoring and decoding a trunked network's digital control channel, from where it can figure out how to track individual conversations. To simply see what *Trunker* can decode, you'll need two things - a radio capable of receiving the control frequency (almost any model will do, though ideally it should have a discriminator output) and some form of f.s.k. data slicer, such as the *Hamcomm* interface, available for about £20 from the likes of Pervisell, whose advert you'll find towards the rear of the magazine.

You'll also need a PC, of course, and one with a free serial port in order to attach the data slicer to. It needn't be too powerful a PC, though, as the program is DOS-based, but I would recommend at least a Pentium-class machine for the best results.

Track Conversations

If you want to actually track any of the voice conversations going on, you'll need a second, and computer-controllable, radio, and not any old model either. *Trunker* currently only supports a handful of models, though; these include the Icom PCR-1000, R10, R8500, R7000 and R7100, radios compatible with the Optoelectronics OS456 standard interface, and the AOR AR2700, AR3000, AR3000A, AR8000 and AR5000. Your PC will also have to have a second free serial port through which to attach this second radio, and if necessary, a level converter of some sort if your radio doesn't have a standard RS-232 interface.

As I've said, actually getting to the point where *Trunker* can track conversations, even if you have the correct hardware, unfortunately isn't easy. The problem is that although *Trunker* understands how to automatically track US trunked networks that lie in the 800-900MHz range, it doesn't understand how to do so for trunked networks in the 400-500MHz range, which is where most, if not all, of the Motorola SmartNet/SmartZone trunked networks in the UK lie.

In order to get it to do so, you have to first of all tell it that you aren't listening to a US-type network by editing a configuration file, a process you'll also have to go through just to get the program to work with your particular PC and data slicer in the first place. At this point, *Trunker* will start filling one of its data files with lists of hexadecimal numbers, these representing the channels being used by the trunked network being monitored.

This is the point where things get tricky, because in order to get *Trunker* to track conversations for you, you

must edit this file and convert these numbers into the true frequency of the channels, represented in decimal. I would have been at a total loss here were it not for an extremely helpful reader called Mike Burgess, who pointed me to a helpful and well-designed Web site <http://www.g7hid.freemove.co.uk/431e.htm> that has a complete list of the frequencies represented by these hexadecimal numbers.

The list was created for a certain London-based trunked network, but if I'm not mistaken, should work with other networks too, as long as they stick to using frequencies between 450 and 453MHz. The site also has a great deal of other useful facts and figures too, but again these will be of most interest to London-based trunk trackers.

Once you've done all this hex to decimal frequency conversion, you can start tracking conversations to your heart's content, something I've been doing at great length over the last couple of weeks, much to the annoyance of my lovely wife Alison. The fact is that, despite its convoluted installation, at the end of the day, *Trunker* simply blows the OptoTrakker and Optocom out of the water for tracking Motorola trunked networks, so I'd urge anyone with any interest in the subject to download a copy from <http://www.geocities.com/CapeCanaveral/Lab/1060/trnk3x.htm>

Note that the version of *Trunker* I've been describing here is not the fully tested release version (*Trunker* 3.4.2), but a beta test (i.e. still undergoing testing) version called *Trunker* 3.7. Don't be put off by the fact that it is a Beta, though - the documentation provided is no worse than that provided with the release version, and I found no bugs nor any significant performance problems of any kind.

One Letter

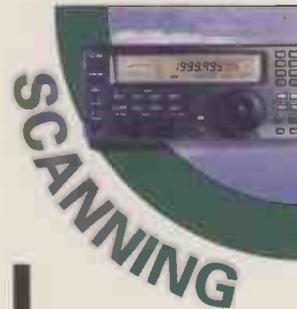
Finally, I just have room to answer a letter I received recently from Mr. S. Fulton of South Yorkshire, who writes to tell me that his local Tandy store recommended he connect his scanner to his television antenna in order to improve reception, and asks whether this would do any good, or might it damage his Realistic PRO-2045?

The good news is that it is unlikely to do any damage to your scanner, but the bad news is that it is highly unlikely to do any good. The problem is that television antenna is designed to be very directional and also very frequency specific - those of you who have tried to receive Channel 5 in some parts of the country using your existing antenna will know just how frequency-specific they can be. So as long as all you want to do is listen to the audio component of television programs, hooking up your scanner to a TV antenna will work fine, but otherwise isn't worth the bother - and yes, I did try it...just in case!

So ignore Tandy's advice and buy a dedicated wide-coverage scanner antenna. I'd recommend you look at something like the SkyScan Desktop, or a basic externally mounted antenna, these being available from several advertisers in this magazine and cost between £50 and £150.

That's All

That's it for this month, but before I sign off, I'd like to remind readers once again that listening to transmissions they are not licensed to receive is against the law, and can result in a fine, confiscation of equipment or even a prison sentence if you are found doing so. You have been warned!



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MilAir

Searching Questions

My thanks go to the several readers who wrote in with favourable comments regarding the Recent 'MilAir Special'. I am pleased to say that the article prompted them to try searching the military airband between 225 - 400MHz, and they have contacted me with the results.

Alan B., who lives in the West Midlands, heard an American voice on **249.75**, the aircraft called 'Foxtrot', and reported that he was in the green and was 64km from the field. He doesn't mention the callsign used, but I am fairly confident that this was probably an aircraft calling the Air Combat Command post at Mildenhall. This is the standby frequency for the more commonly heard **312.45**, and is not heard in use very often.

David S. has sent me an E-mail regarding two unidentified frequencies, the first being **364.675**. He reports that he heard American voices on this frequency, and although it was faint, he thought it sounded like an Air/Ground operations frequency, a deduction he made, as he could not hear the other side of the conversation. I have no current record, and have had no other reports, regarding 364.675. It does, however, pose an interesting question, as this frequency was listed some time ago as an old Alconbury operations frequency and by coincidence I have had two recent reports of aircraft using Alconbury as an emergency diversion airfield. On both occasions the aircraft apparently used the NATO common frequencies, Tower **257.8**, Approach **362.3**, Radar **385.4**, etc. One report indicates that it was Mildenhall based aircraft that diverted, but if so, why didn't they go to Lakenheath?

As the airfield closed to Air Traffic back in March 1995, and was handed back to the Ministry Of Defence in September of that year, I have to admit I remain rather sceptical that Alconbury has been brought back into use after four years. There are no reports that it has even been kept on a care and maintenance basis, and as far as I am aware, the main military presence there is to run the USAF Education Unit. However, I would be happy to have my scepticism dispelled if any of our readers can expand on the story of the aircraft movements through Alconbury.

The other frequency that David S. noted during his search was **278.125**. What sounded like RAF voices were heard, and it appeared to be a tactical frequency as the pair of aircraft were heard to attack a ground target. Any ideas?

FAA/RAF Changes

Following up my comments last month regarding future RAF unit changes, some further information has come to hand. 1 Squadron from Wittering (Harrier GR.7) are also expected to move to Cottesmore during the year 2000. In addition, it has just been announced that the three Fleet Air Arm, Sea Harrier squadrons from Yeovilton (800/801/899 Squadrons), are also to move to Cottesmore over the next three years. By then, Cottesmore will have most definitely become a Harrier super base with almost all of the UK's Harrier types based there. The re-organisation will be a linked command between Wittering and Cottesmore, and will be called 'Joint Force 2000'. I wonder if 1 Squadron

will need to move to Cottesmore if it is a joint command?

From a financial point of view, I am sure it makes sense to base all the Harriers at one airfield, but from a tactical military viewpoint, I am reminded of the saying about 'having all your eggs in one basket'! Thanks to **Ian McD.** for the newspaper cutting.

In June 1999, 16 (R) Squadron from Lossiemouth are due to re-locate with the other RAF Jaguar squadrons at Coltishall. Their departure is expected to pave the way for the future arrival of 14 Squadron, when Bruggen closes in 2001 or 2002. The other Bruggen Tornado Squadrons (9 and 31) are currently expected to re-locate to Marham. The final Bruggen Tornado Squadron, 17 Squadron, disbands on March 31 1999.

For the MilAir listener it will be an interesting couple of years, with possibly a selection of new MilAir Air-to-Air and Squadron operations frequencies to listen out for.

Spadeadam - Update

I am grateful to **Fred S.**, who has sent me an E-mail regarding my comments about Spadeadam Range (SWM March '99). A point I forgot to mention is that the viewing point for Wiley Sike is at a lay-by located next to a small weather station. Fred suggests that before you drive miles into the range, park in a lay-by on the A69 between Greenhead Bank and Low row, a period of time spent here will soon give you a clue as to whether the range is active. He emphasises the point that just turning up on the off chance of seeing some flying can be a bit of a lottery, you should ensure that flying is planned before making a visit. Listen in to Newcastle Approach on **124.375** and Pennine Radar on **128.675**, as both of these frequencies pass information regarding the active state of the range.

Fred also lists two 'phone numbers to ring for the RAF liaison officers to ascertain if flying is to take place, but I am loath to print them in SWM as I don't want the RAF inundated by calls! Possibly the best way to find out is to check the UK Daily Navigational Warnings on the National Air Traffic, Aeronautical Information Service Web site at: <http://www.ais.org.uk/> (Spadeadam/Danger Area 510). Lastly, Fred lists a 'hot' frequency to listen out for, and that is **149.275** (n.b.f.m.), the link between the caravan and the Forward Air controller. If this frequency is active you know you are in for some entertainment!



This month's photo is the E-3B/C of the 552 md 550 second Air Control Wing from Tinker AFB.

UKADGE/UK ASACS!

Finally, some last minute news about the UK Air Defence Radar System. The United Kingdom Air Defence Ground Environment system (**UKADGE**), is no more - well, in name, anyway. It has been re-named the United Kingdom Air Surveillance and Control System (**UK ASACS**). There will be a detailed look at this next month.

Once again, I must remind readers that all replies will be made via the 'MilAir' column, so please do not send in s.a.e.s for a reply, I just don't have the time - sorry!

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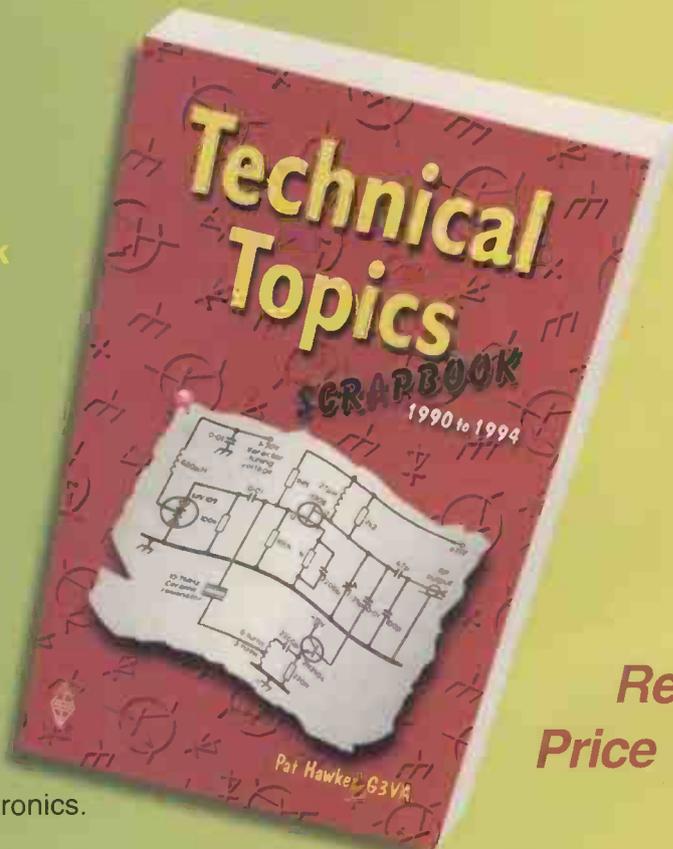
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Info in Orbit

This month's column includes the final section of my two-part 'WXSATS for beginners' feature. Last month I showed some examples of the images that can be obtained from the polar orbiting and geostationary WXSATS, and the nature of the transmissions. I also covered some of the basic principles of orbits. Now I am looking at reception systems.

Tuning Into Satellites

Some years ago I had a call from a television company doing a feature about a local school tuning into the *MIR* space station. Aware that I have been monitoring *MIR* for several years, the company contacted me for information about what might be possible. I explained the details and showed one of the TV crew how to tune his hand-held scanner to *MIR*'s normal voice channel. I also provided pass times for that day.

The programme subsequently showed that although the school had no luck at all, the television crew had cleverly discovered how and when to monitor *MIR* using a hand-held scanner! They did not mention yours truly.

My (main) point is that you can tune to many satellites while sitting in your garden using a simple hand-held scanner and external antenna. Modern buildings can behave like sealed metal cavities, into which not all signals can penetrate.

For WXSAT monitoring, whatever antenna is used (the choice depends on the frequency), the antenna must be suitably positioned outside. You should then hear several satellites including WXSATS, amateur radio and communications satellites, amongst others. This is monitoring - not decoding. For good decoding, each component must be designed for the job.

Basic System

A complete system for receiving and decoding WXSAT signals includes a suitable antenna and receiver, and a decoding system. Each part of this system (with few exceptions) is dedicated - that is, it is unlikely to be useful in any other system. For example, the receiver is unlikely to be suitable for any other form of monitoring - so think in terms of setting up a permanent system for WXSAT monitoring.

Four Main Systems

The first decision of any would-be purchaser is which of the four possible satellite imaging formats they wish to receive. Let us have a brief look at each option. Definitive costs are difficult to provide; check current retail prices.

1) Polar orbiter a.p.t. system

This is the first of the two most common forms of WXSAT image decoding system - the other being METEOSAT WEFAX monitoring.

Antenna

The antenna is designed for the 137MHz band and will receive signals on the various frequencies listed for NOAA, METEOR, RESURS, OKEAN and SICH WXSAT transmissions. Common types include the crossed dipole, the turnstile and the quadrifilar helix antenna (QFH). I hope to build a QFH shortly - my current antennas having developed faults.

Receiver

The importance of using a properly designed WXSAT receiver has been emphasised many times in this column. Normal scanners are not designed for extracting picture modulation.

WXSATS require an i.f. bandwidth of some 30kHz (plus Doppler changes of up to 15kHz due to the movement of the satellite); this increases the frequency spread to 45-50kHz. A properly designed WXSAT receiver is essential if pictures are to be decoded.

There are few commercial companies in Britain currently providing receivers. Timestep carries advertisements in *SWM*. Catalogues from Maplin and Cirkuit show a selection of receivers available for a variety of satellites - including weather satellites.

Kits are different. They require electronic construction skills and test equipment. Members of the Remote Imaging Group can buy a kit and build the RIGsat RX2 receiver for a shade under £50. Receiver facilities should include frequency scanning across the standard frequencies.

Decoding

WXSAT receivers provide an output signal for subsequent decoding. *Windows* and *DOS* based computers permit the largest choice of decoding hardware/software. Commercial products may include an interface card and software.

The decoding card receives the audio signal, decodes it, and displays the resultant image line-by-line, in real-time. Image format varies between satellites so software options allow



Fig. 1: Crossed dipole 137MHz antenna (on my roof).

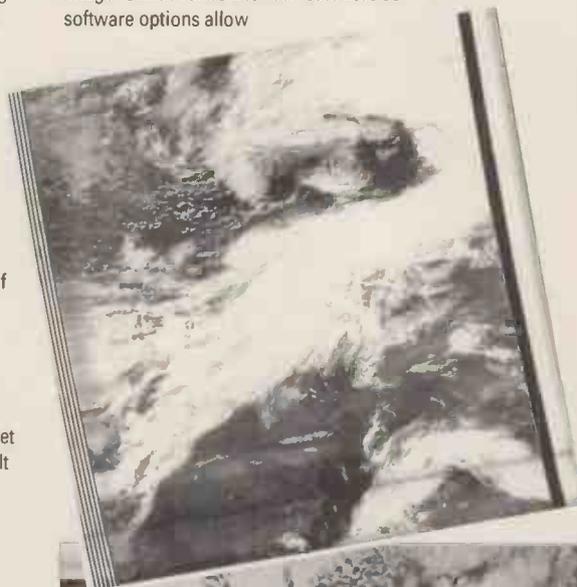


Fig. 2: RESURS-01#4 1050UTC 10 March from Keith Richardson in North Worcestershire.

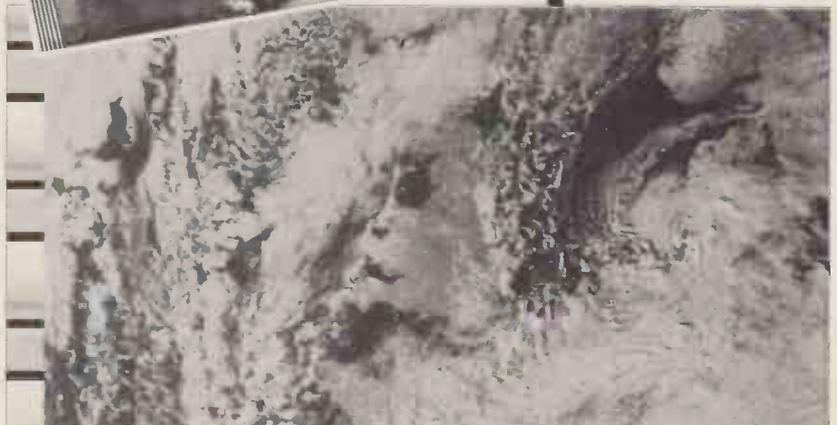


Fig. 3: NOAA-14 (visible-light image) snow over western Britain 1402UTC 10 February.



Fig. 4: *OKEAN-4* radar, visible-light 1434UTC 11 March.



Fig. 5: *NOAA-12* image 7 August channel 3 h.r.p.t. from Peter Schoan of Helmbrechts.



Fig. 6: PDUS *GOES-8* visible-light image 1855UTC 10 March.

selection, as well as the direction of travel. Programming (scheduling) should be provided.

There are also some Shareware/Public Domain programs, of which examples are *WXSAT*, written by **Christian Bock**, and *WAVZIP* by **Steve Bonnett**. These require a sound-card to analyse the incoming signal; the programs cope with a.p.t. and WEFAX (apart from other modes), and require parameter adjustment.

2) Polar Orbiting h.r.p.t.

The *NOAA* WXSATs obtain high resolution images - about 1.1km. This data is transmitted in the 1700MHz band as multi-channel imagery, and it can be received and decoded. A suitable small

dish antenna is controlled by computer to track the satellite's telemetry.

A high precision receiver is required to extract the multi-channel information, and a computer then processes the data to produce pictures. The cost of a complete system is now around £2000 - a tiny fraction of the cost of a similar system ten years ago.

3) Geostationary *METEOSAT-7* WEFAX Reception.

This is the alternative cheap entry into WXSAT image decoding. For WEFAX (1691 and 1694.5MHz) reception we use either a fixed 1m dish with horn or dipole, or a Yagi - and point it at *METEOSAT-7*. The WEFAX data streams are transmitted (sometimes simultaneously) on these two frequencies -

the first being the main (A1) channel, the second (A2) that carries selected formats including images from other geostationary WXSATs.

The dish is the more common form of antenna, but both are very effective. A dish diameter of 1.8m is officially recommended by EUMETSAT for WEFAX reception (known as SDUS - Secondary Data User Station) in order to guarantee

uninterrupted reception during periods of multi-satellite operations. Most of the time reception is satisfactory from smaller dishes, but a high quality pre-amp is essential.

Receivers for *METEOSAT*'s WEFAX transmissions are available, or you can use a down-converter to convert the 1691MHz signal to 137.50MHz, and then feed this into a standard WXSAT (a.p.t.) receiver. Identical modulation techniques are used for WEFAX and a.p.t. - hence the ability to mix systems. Decoding WEFAX is similar to a.p.t., so software usually includes both options.

WEFAX images from all geostationary WXSATs are transmitted according to their individual published schedules. *METEOSAT*'s infra-red (D2) and visible-light (C02) formats, which include western Europe, are transmitted twice per hour. Software usually permits animation sequences and these are often shown on television. Whole disc images from all three sensors are transmitted regularly, as are images originating from *GMS-5* (Japanese) and *GOES-8* (USA).

4) Geostationary PDUS Reception

As with all geostationary WXSATs, *METEOSAT* produces a data flow of high resolution images. Unlike all other satellite operators, EUMETSAT prevent free access to their data by encrypting all but a few of the high resolution images and charging fees for a decryption unit. This action appears to contravene their own 'Mission statement', as well as damaging the systems manufacturing industry.

Transmissions of non-*METEOSAT* imagery are not encrypted, and neither is WEFAX. Consequently, Primary Data User Systems (PDUS) should, perhaps, be seen as providing images from *GMS-5*, *GOES-8*, *GOES-10* and *INDOEX*, and their value judged on this basis.

For PDUS reception a dish size of about 1.8m or larger is required; a suitable receiver and decoding system completes the hardware. An off-the-shelf system may cost something less than the h.r.p.t. equivalent.

To summarise - it is not difficult to receive signals. If you want to decode the signals to produce pictures, you need a properly designed system. Buying a complete 'plug-in-and-go' set-up can make sense because you are guaranteed compatibility.

Prices vary enormously because of the differences in hardware capability. A complete *METEOSAT* receiving system can be bought in Britain and other European countries, as can receiving equipment for the polar orbiters. Combined systems are available. These prices are guidelines; special offers and kit options may reduce these levels.

The Future Of WXSAT Transmissions

Major changes are ahead. *METEOSAT* WEFAX data will change sometime after the year 2000 when a new system - Low Rate Image Transmission (LRIT) is planned for the next generation of *METEOSAT*s. Until then we have several years of WEFAX. Comparable changes to digital transmissions for the polar orbiters are planned - but are many years away. This column will keep readers up-to-date.

Current WXSATs

On 10 March, *RESURS-01-4* and *METEOR 3-5* were still transmitting a.p.t. on 137.85MHz, and were therefore difficult to monitor because their pass times largely overlapped. On 11 March *METEOR 3-5* was switched to 137.30MHz, ending the problem. Transmissions from the three *NOAA* WXSATs continue normally. The *NOAA-14* daylight pass images are rapidly improving as spring progresses. I received two short transmissions from the oceanographic satellite *OKEAN-4* on 11 March - at 1300 and 1438UTC.

OKEAN Mosaic From SMIS

Transmissions from *OKEAN-4* (a.k.a. 1-7) are infrequent, due to the power constraints of the sounding equipment used for image production. An example of the final product of these radar

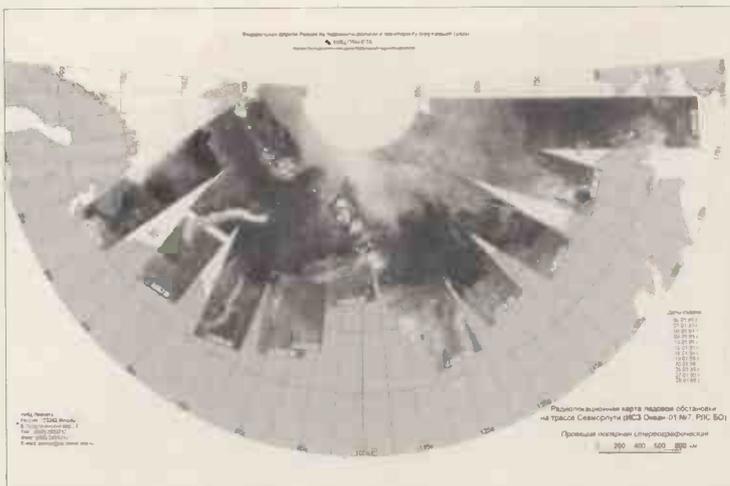


Fig. 7: OKEAN-4 radar image mosaic (137.40MHz image).

connecting to the Zarya module, Unity will eventually provide attachment points for the US laboratory module Node 3, an early exterior framework, or truss for the station, an airlock, and a multi-windowed cupola. The second *International Space Station* assembly flight, STS-96/ISS 2A.1, includes one space-walk for equipment transfer and logistics for ISS.

images can be seen in **Fig. 7** - a composite radar map of ice conditions in the Northern Ocean (Russia's northern sea route).

Figure 7 is a standard monthly production of the Russian Scientific and Research Centre of Space Meteorology (SRC PLANETA), the principal Russian organisation for receiving and disseminating data from weather satellites (under the authority of Russian Federal Meteorological and Environmental Service). This image is a monthly mosaic of a dozen OKEAN passes (dates are imprinted on each passage swath, as well as listed to the right below the image).

The data is received from the onboard side-view radar station (named RLS-BO). My thanks to Eugene Flitman, leading software engineer at the Space Monitoring Information Support, Space Research Institute (Moscow, Russia), and to the associated organisations for permission to publish this OKEAN mosaic.

New Products

Readers may be aware that the number of British suppliers of WXSAT equipment is down to about one - Timestep Weather Systems of Newmarket. Maplin Electronics and Cirkit still supply a receiver and some small associated components, but variety appears minimal. If any reader knows of other manufacturers of WXSAT products, please advise me or refer them to this column. If I do not know - I cannot tell!

Timestep have informed me that they are bringing out new WXSAT products this year, and sent me a 'just into production' model of their new Windows LC interface. I may be doing a full review shortly, but briefly, the box is a stand-alone unit that takes the audio signal from a WXSAT receiver (WEFAX or a.p.t.) and provides a data stream into a serial port on a computer to produce the picture.

The software allows real-time zoom in and contrast settings, and individual modulation level setting adjustment for each satellite; this allows the optimisation of images from NOAA, METEOR, RESURS and OKEAN - all in software and in real-time. Once adjusted, settings are remembered.

Timestep's new web site is at: <http://www.time-step.com>

International Space Station

Although this may seem a little off-topic (from WXSATs), the interest shown by readers - as reflected in my postbag - justifies coverage on a regular basis.

The first component of the *ISS* was the Zarya control module (Functional Cargo Block - Russian acronym FGB), a US-funded and Russian-built component launched last year aboard a Russian rocket from Kazakstan. The first US-built component - Unity - was carried to orbit aboard the Space Shuttle Endeavour, and mated with the Zarya. In addition to

ISS Transmissions

Although there is a beacon on Zarya, reports suggest that it is not on continuously, but is more likely to be on whilst over Russia (as was originally the case with the early METEOR WXSATs). Chris van den Berg suggested that those wishing to try to monitor transmissions should put their receiver in u.s.b. mode, and quickly scan the spectrum between 634.200 and 633.830MHz.

Sven Grahn advises me that he used a high gain antenna to tune to the 634MHz band and heard the signals. **Dave Cawley** pointed out that this frequency is in the UK television band so signals might be identifiable using a high gain TV antenna. I decided not to dismantle the family TV antenna (!) just to satisfy my curiosity; I am about to experiment with a log periodic obtained locally. I will report results as soon as they are available.



Fig. 8: Shuttle with Zarya module.

Kepler Elements - WXSATs, 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.

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 transmits a.p.t. on 137.30MHz.
 OKEAN-4 and SICH-1 use 137.40MHz.
 RESURS 01#4 transmits a.p.t. on 137.85MHz.
 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.
 ISS (Zarya module) uses 634MHz for beacon.

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Airband

Do you visit Farnborough? It's years since I last went but it seems that casual visitors are often accepted. A note on the Internet came my way as it exhorts magazine contributors to publicise this fact.

Apparently, the secret is to obtain permission from Security first (on the left as you come into the BAe site, single-storey 'Management Pavilion' building). The alternative could be a total ban on visits by enthusiasts.

Information Sources

You can now obtain the database from **Len Woolley** (3 Furze Gardens, Morwenstow, Bude, Cornwall EX23 9SX) at £2.50 all inclusive. On a pair of 3.5in discs, you need *Windows 95*. Len doesn't say if he wrote the software himself or if purchasers also need a proprietary database package. There are over 120 airlines in the list plus other types of flight; additionally, some frequencies and aerodrome and airline codes.

Looking up under callsign such as Speedbird finds the route, although I'm not sure if this is by callsign number or flight number - not always the same for larger airlines. Looking up registration yields flight number (or is it callsign?). Len has put a lot of work into this but it can only show regular/constant flights. It is hard to keep up-to-date when it comes to one-off charters, etc.

For **John Weir** (Edinburgh) I can trace some callsigns in ICAO Doc 8585/105 *Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services*, the official source. You can buy your own copy from the CAA but it's expensive. The address for purchase is on my *Airband Factsheet*, free of charge if you send a self-addressed reply envelope, pre-paid to hold two A4 sheets, to the Broadstone Editorial Offices (not to me!), and now available on the *SWM* website.

I found Birdie to be Air & Training Center West (Denmark); Constellation is Constellation International Airlines (Belgium); Liberty is Freedom Airlines Inc. (USA); Smokey is shared with USAF Europe and the German Air Force; Windsor is Britannia Germany.

In The Air

John's also looking for the SUGAL reporting point but I can't find anything sounding like it in my UK alphabetical list. Try to send me more information, such as the route taken by aircraft passing this point, John. As to Scottish Military, these frequencies were listed by Peter Bond in 'MilAir' on page 62 of last October's *SWM*.

Information on which aircraft went where is hard to find unless you have access to movement logs for individual airports. If anyone has inside information on the following, write in so that I can publish it for John's benefit. They are: American 9581/2 on February 7; Speedbird 71L on February 16; KLM 9107 on February 20; finally G1159. I see that United Nations 03 was working to/from Trenton on February 17. You might get more information by a search of Len Woolley's database, described above.

On the display in a 'glass cockpit' aeroplane cruising above Edinburgh Airport, it is possible that the airport itself would not appear since it is not on the route. The pilot could remove the

excess clutter from the display that would otherwise appear each time a nearby airport was being overflown. The display should show TLA, the Talla v.o.r. beacon to the south and PTH, Perth v.o.r. to the north, while flying on UB4.

Finally in answer to John's many questions in this section, you can't always see the vapour trail from the passenger cabin as it starts behind the aircraft, in the blind spot. The vapour has to cool after leaving the engine before it condenses visibly. Also, aircraft generally keep their SelCal codes unless moving to operate in a different geographical area where a conflict might arise with another identically-coded airframe.

Follow-Ups

All relate to the March 'Airband'. Officially speaking, says **Martin Sutton** (CAA), there are no marine liaison frequencies in the v.h.f. airband. A reader in Swansea is aware of a local arrangement between Mumbles Coastguard, an air ambulance and Swansea Airport where the three agencies communicate in the airband on 132.65 as distinct from Swansea's usual 119.7MHz.

Scottish Airways frequencies were covered but to clarify for John Weir, 126.925 is as directed by ATC and 126.25 is Moray sector. There is no London frequency of 131.15MHz.

Trying to identify N1505 for **Les Griffiths** (Sheffield) is proving difficult. According to **Jim Woodrow** (Livingston) the registration now belongs to a PA-32R Cherokee Six.

Jim says that if I had an E-mail address it would "...speed up responses". Sorry to disagree but I'm all for socially-appropriate technology, not gadgets for their own sake. When writing from abroad, E-mail would indeed be quicker. In your case, Jim, I tore open the envelope and read the letter immediately it arrived (the day after posting it first class). With E-mail I'd have to remember to check the computer each day, turning it on and waiting for boot-up, dial a network provider, wait for mail to download on a low-capacity twisted-pair telephone line, virus-check it, print it out...

I also mentioned that pilots hoping to view the total solar eclipse in August should be prepared for night conditions. **Chris Brenton** (Plymouth) asked his legally-trained partner who feels

that the conditions for night would be fulfilled. Well, sorry Chris, the sun won't be below the horizon so it's legally day! The CAA are yet to make any

Abbreviations

AAIB	Air Accidents Investigation Branch
ATC	Air Traffic Control
a.t.u.	antenna tuning unit
BAe	British Aerospace plc
CAA	Civil Aviation Authority
GASIL	General Aviation Safety Information Leaflet
GHz	gigahertz
h.f.	high frequency
ICAO	International Civil Aviation Organisation
kHz	kilohertz
MHz	megahertz
r.f.	radio frequency
SelCal	selective calling
USAF	United States Air Force
v.h.f.	very high frequency
v.o.r.	very high frequency omni-directional radio range

Piper Arrow IV. Christine Mlynek.



Beech F33A Bonanza. Christine Mlynek.



Continued on page 78.

Airband

Continued from page 77.

ruling that would regulate the large number of aircraft expected.

I gave the new ICAO locator for Truro which Chris reports is now licensed. I agree that it's a change for a small aerodrome to expand. Local authorities and other owners see airfields as a source of land to sell for housing development. That way, they get rich quick this year. What about next year's budget? How are they going to make ends meet when the land's all been sold already? To my mind, relying on the selling of capital to meet annual running costs is a sign of impending economic disaster.

Another Disaster

Talking of disasters, Chris notes that a flight ended in one at Plymouth when a Dash 8's left main undercarriage collapsed at the end of the landing roll on February 28. It may not have been airborne but passengers were still aboard and so this counts as an accident and a report by the AAIB is to be expected. I'll summarise it here when it appears.

Receiver Hardware

Advice on h.f. reception is sought by **Peter Quinn** (Co. Mayo). There are two problems. First, natural noise is always high and will limit the weakest signal you can hear. So, great sensitivity is neither required nor a good idea in an h.f. set. Next, the bands are crowded, often with nearby strong signals. To avoid interference, your h.f. set needs to keep out all but the wanted signal. Wide band scanners, by definition, are designed to accept too broad a range of signals for really clear h.f. listening.

Peter has a Yupiteru MVT-7100. I haven't tried one myself but, as advertisements in *SWM* quote a range of 530kHz-1650MHz, I'd bet that improved front-end selectivity is going to make a difference. Some sort of pre-selector or a.t.u. is therefore recommended.

You don't want an antenna that overloads a wide band scanner with excessive signals. A passive wire should yield plenty of signals, only choose an active antenna if space is limited. I can't comment on the Moonraker series, the HF-30 is advertised as covering 50kHz-2GHz but with no details as to how this is achieved with such a physically small unit. Again, a wide band antenna, perhaps an active one, risks introducing more signals than a scanner can cope with. Unfortunately, the expense of a dedicated h.f. receiver really is worth it. Second best is a scanner with some front-end preselection.

I don't know where you are in County Mayo, Peter, but I gather that you have UB1 in sight to the south. To the north of you is UN537 and I wonder if you can see aircraft on this airway, too? To get an idea of scale, time how long a cruising jet remains in view (in seconds) then divide by seven. This gives a very rough estimate of the number of nautical miles covered during that time.

John Weir is disappointed with the AOR AR8200 wide band scanner but didn't say exactly what the trouble was. Could you write in with more details as other readers might be interested too, John? You did say that you tested it in parallel with the Yupiteru MVT-7100. Is there any chance that its local oscillator was being picked up by the AR8200, thus spoiling reception? In 'Scanning' (March page 73) Faris Raouf also tested the AR8200. Again, he doesn't comment on r.f. performance but didn't suggest that the set was totally useless.

No set, scanner or airborne, needs to display the last decimal places on 8.33kHz channels. You can take it, John, that 118.0083 is near enough to the actual 118.00833MHz as the receiver won't be accurate down to the last 30Hz!

Frequency & Operational News

Details from Martin Sutton or *GASIL*. Islay runway 13/31 has been reinstated. Pembrey's new airfield has frequency 124.4 but it lies in Danger Area D118 for which crossing approval is required on 122.75MHz; runway is 04/22 and ICAO locator code EGFP. At Teesside the existing frequency 118.85MHz now offers a Lower Airspace Radar Service (*GASIL* 1 of 1999 from the CAA).

All letters/information received up to March 8 have been included. The next three deadlines (for topical information) are May 10, June 7 and July 5. Replies always appear in this column and it is regretted that no direct correspondence is possible.

DX Television

A few fleeting snatches of Meteor-Scatter and a couple of weak Sporadic-E openings meant that February was thin on the ground for propagational entertainment. Let's hope for better things next month!

Readers' Reception Reports

Both **Peter Barber** (Coventry) and **Stephen Michie** (Bristol) have been concentrating on Meteor-Shower DX reception. On the 8th, Peter monitored R2 and was rewarded with the RTR network from Russia. Incidentally, the logo resembles a striped 'PJP' in the top-left of the screen. Amazingly, the station was seen again the following day but via Sporadic-E, when President Yeltsin was seen disembarking from an aircraft after returning from King Hussein's funeral. Sporadic-E also affected Channel E2 from 1708. A '1' logo was present in the top-right of the picture, but its source could not be identified.

Reception Log For February

Reception reports for this month's log have been supplied by Peter Barber, (Coventry), Stephen Michie (Bristol) and **Simon Hockenhull** (Bristol). All times are in UTC.

Day	Log
8	Russia (RTR) on Channel R2 with logo. This was seen at various times during the morning via Meteor-Shower (MS).
9	Russia (RTR) R2 from 1654 until 1655 via Sporadic-E. Unidentified programme on Channel E2 with '1' logo and children at play between 1708 and 1715.
10	Denmark (DR-TV) on E3 with the PM5534 test card at 0725 via MS.
14	Unidentified programme on E3 via MS at 1516.
15	Unidentified signals on E3 via MS at 0749 and 1421.
19	Denmark E3 with the PM5534 test card at 0715 via MS.
20	Unidentified signals on E2 between 0900 and 0930 via Sporadic-E.
23	Netherlands (NED-1) E4 via tropospheric-scatter at 1630.
24	Denmark E3 with the PM5534 test card via MS at 0931.

New Relays

Channel 5 is expanding its analogue terrestrial network, using low-power relays in some towns and cities. Relays include Cambridge on Channel 34, Croydon (Old Town) on Channel 59, Norwich Channel 33 and Peterhead on Channel 68. Within a few months, Channel 5 will also be available from the Middleton relay north of Manchester. The e.r.p.s are not known.

Be on the look-out for unlisted television stations if you are into UK DXing. Since March 4, a temporary relay has been operating at Middleton (north of Manchester) using the channels BBC-1 on Channel E22, BBC-2 on E28, ITV (Granada) on E31 and Channel 4 on E25. Its e.r.p. is thought to be in the region of 10 to 20W.

Spanish Closure

Roger Bunney (Romsey) tells us that the Spanish TVE-1 Channel E2 outlet at Madrid is rumoured to have closed. This could actually be good news, since it will provide an uninterrupted reception path into Africa for exotics such as Ghana or even Spanish Equatorial Guinea.

Throughout the Seventies, Spanish transmitters switched off during the afternoon and would re-open around 1600UTC. The lack of transmissions from the Spanish mainland meant that a reception path was wide open from the south. In

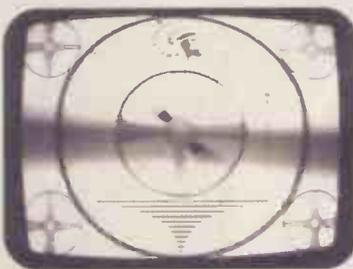


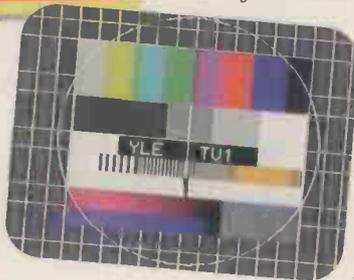
Fig. 1: The RCA 'Indian Head' monochrome test card. This off-screen photograph shows the version used by Kuwait Television.

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



Fig. 2: A colourful Venetian scene via slow-scan television, received by George Newport in Canterbury.

Fig. 4: The FuBK electronically-generated test card radiated by YLE-1 in Finland.



1974/1975, **Hugh Cocks** (now living in Portugal) monitored the RETMA 1956 test card on Channels E2, E3 and E4 for several hours one afternoon on the south Devon coast. Its origin was African, possibly from the outlets of Kisi, Jamasi and Accra in Ghana. It would be exciting to think that such events may happen once again!

Listening For DX

Steve Harper (Sete, France) enjoyed the beginners' DXTV article in the January issue of *SWM* and wonders what part scanners can play in the hobby. Well, Steve, stations can be identified by listening to sound carriers; when tuning into vision carriers, a low-frequency buzz will be heard. By noting frequency offsets, specific transmitters within a country can often be identified. Listening between 40 and 45MHz can often reveal early warning signs of Sporadic-E openings occurring on the TV frequencies.

When using a scanner, unidentified transmissions are often encountered. Peter Barber (Coventry) has noticed an infrequent but strong signal at 55.240MHz, consisting of someone giving an instruction, but never lasting more than one sentence. Other mysteries include data transmissions commencing at 48.255MHz, and then slowly ascending in frequency throughout the day, ending at 48.275MHz!

Incidentally, **Godfrey Manning** (Edgware) advises that a new, presumably legal, cordless telephone allocation is 31-39MHz (See April's 'Scanning' column for details - Ed.). This confirms recent observations by **Brian Williams** (Penarth).

Digital Propagation

Terrestrial digital TV is already a reality in the United Kingdom, while other countries are still preparing or experimenting with it. The u.h.f. band seems to be the preferred part of the broadcasting spectrum for digital transmissions by the frequency planners, but are these frequencies really suitable?

We tend to regard u.h.f. propagation as being more stable than v.h.f., but what is becoming increasingly obvious is that signal strength along a reception path varies continuously, even under so-called 'flat' conditions. One enthusiast has encountered signal-level variations of up to 10dB within 20km of the Stockland Hill transmitter. The use of a spectrum analyser has confirmed that the shape of the digital multiplexes (MUXs) actually contort over a short period of time! Variations in reception, caused by weak digital signal levels and changes in atmospheric pressure, have also been experienced close to the Belmont mast in Lincolnshire.

Levels

There is a minimum recommended signal level of around 41dB μ V, at which the digital receiver will function but there is also a maximum level, governed by the analogue carriers. If these exceed 79dB μ V they can distort the digital MUXs, particularly if they happen to be located on adjacent channels. Since the digital levels can be 20dB down on their analogue counterparts, perhaps a target level of 50dB μ V would be the answer when installing antennas.

The main concern is at what point can we confidently say the digital signal levels are correct when installing an antenna for digital terrestrial reception? These may well be within limits at, say, noon, but will there be pixelation by supper-time as soon as Mrs. Merton pops up and opens her mouth? This may come as welcome relief if you don't happen to like Mrs. Merton (and, let's face it, who does?), but for the discerning audience, break-up of the picture is frustrating not only for the viewer but also for the antenna contractor who will be up and down his ladder like a yo-yo hoping for a satisfactory signal.

Polarisation Change

Polarisation shift has also been noticed over a fairly short transmission path. Can a local reflecting surface be the cause, or is it something within the atmosphere that can affect it? We would be interested to hear any theories from all you propagation boffins out there!

TV Graphics Spot

Godfrey Manning (Edgware) vividly remembers the Anglia TV horse featured in the December column. Godfrey recalls that the rotating horse with rider was accompanied by a short musical phrase which sounded like the first two bars on the French horn from Händel's *Water Music*, but which came to an abrupt, but musically complete, end. At station opening, a longer version of the music was played. There was a large metallic model of the horse in the foyer of the Anglia studios at Norwich. Is the horse still there and, more importantly, why was a horse chosen in the first place?

A newly released film called *Pleasantville* should leave test card fanatics slobbering with excitement. In one scene, which resembles American life in the Fifties or Sixties, the ubiquitous Indian Head test card suddenly pops up for a fraction of a second while the family flicks through the TV channels. Incidentally, did anyone notice the heart-shaped logo used by Channel 5 on St. Valentine's Day?

And finally, *News At Ten* on ITV is now history. Introduced on July 3 1967, the final bulletin was aired on Friday March 5 1999, no doubt to enable uninterrupted four-letter filth to be aired two seconds after the so-called nine o'clock watershed. With the way British TV has plummeted to new depths from the moment Channel 4 was introduced, John Logie Baird must be spinning like a roast chicken on a spit!

Keep On Writing!

Please send reception reports, off-screen photographs, news and information to arrive by the 1st of the month to:-

**Garry Smith, 17 Collingham Gardens,
Derby DE22 4FS.**

Please note that photographs can be submitted on PC disk if preferred.



Fig. 3: Another slow-scan TV picture received by George Newport.



Fig. 5: This month we have two 'Down Memory Lane' brain-teasers. Do you remember this logo used in the '50s and '60s by Independent Television News?



Fig. 6: The second memory-jogger! The graphics used for the first edition of *News at Ten* on July 3, 1967. The final edition of the programme was broadcast on March 5, 1999.

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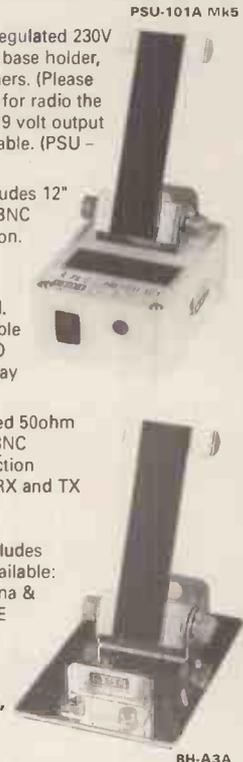
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ShackWare

Welcome! As I write, it's a gloriously sunny Sunday afternoon, Spring's almost here and the Heathkit SW717 behind me is humming to the sound of Italian voices shouting "CQ contest, CQ contest". There's a lot to get through this time and, having devoted almost all of March's 'ShackWare' to the excellent PCR1000 and Toshiba Libretto, let's turn the spotlight on your letters. So, it's straight on to Len of Plymouth, who writes with detailed instructions of how he got the freeware PC ACARS program, KRACARS, I sent to him, running under Windows 95. Take it away, Len...

"Your readers may be interested to know that, after some initial problems, I now have the program working perfectly. In order to run KRACARS in Windows 95, I created a shortcut to the desktop then, after switching wave player off and connecting receiver 'audio out' to 'mic in' and then switching on 'mic in' both the record and volume mixer, it was then just a case of adjusting the receiver and mixer volume.

"To open the log file, I use Works 4.0. Under the file menu I click open and look on the desktop for KRACARS.LOG. This allows the log to be opened in word processor format and it is then a simple matter to save the file to 3.5in disk for later perusal. I then bin all the shortcuts. My only remaining problem is that I occasionally get a divide error message which I think may be related to audio input level. Also, after starting the program, it's worth watching the signal strength meter for a couple of minutes as it often resets to zero and has to be tweaked accordingly. Overall, the results are excellent!"

Len sent several pages from his log files, which prove the quality of KRACARS decoding. Remarkably, and having never monitored ACARS prior to using the program when I first tried it several years ago, I really did simply boot it up, plug in the audio from my scanner tuned accordingly, and pages of decoded information scrolled up the screen. It worked perfectly, without any tweaking, first time, and I heartily recommend the program to any PC-owning s.w.l. interested in aircraft transmissions.

From Reedham, Norfolk, David Holdsworth writes "I am a long time s.w.l. and have just got into computers. Recently I was given three BBC computers including three monitors, printers, 5.25in disk drives and all the gear to go with them. Trouble is, I can't figure how to get the disk drives running, I don't know what keys to press and I really could do with some help. Also, can I get decoding software disks for them as I want to decode c.w., RTTY, WEFAX, etc. I plan to keep one machine and sell the others."

Lucky you! BBC computers complete with monitors, printers and drives still make for a pretty good freebie even in this age of PC everything. Though you didn't give details, most drives connect to the BBC via two connections: one to the drive port (a 34-pin IDC connector on the underside of the machine marked 'disc drive') and one to the four-pin d.c. out socket - the Beeb was always intended to power its peripherals directly, saving you cable mess and making everything that much easier. However, as well as drives, you need software (actually, firmware in ROM) to operate them, and this is either in the form of Acorn's own DFS (disk filing system) or a third-party offering such as that from Opus or Cumana.

Usually, you'll see a copyright message of some sort as you switch on the machine, telling you which DFS is installed. If you don't, try issuing a system command such as ROMS or HELP, which will tell you which ROMs are installed in the machine. Somewhere in the list will be a DFS. Now all you have to do is figure out what commands it requires! Fortunately, this is easier than you might think because the command structure for most versions of DFS are pretty much the same. With a disk in the drive try CAT to get a list of what's stored on it, LOAD 'file', SAVE 'file', COPY source, dest, file, DELETE file and (with DFS 2.0) FORM to format a disk.

Decoding the 'simple' data modes is easy and perfectly

possible with a BBC, disk drive, and suitable monitor, though acquiring the long out-of-date software is not so easy.

Technical Software's RX8, which I believe was available on sideways ROM (ready to simply plug into the machine and go), was definitely one of the better offerings (as was all of Technical Software's stuff) and you can still find the MapSat weather satellite receiver with interface and software for the BBC machines if you're prepared to scour radio rallies and the like (mine cost £75 several years ago and came complete with turnstile amplified antenna, computer, monitor, drive, receiver, interface and software).

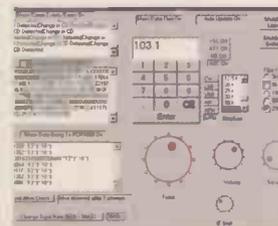
Alternatively, an ad in SWM's 'Trading Post' section should do the trick. Expect to pay a few tens of pounds, but don't expect the output to be on a par with even shareware stuff for the PC. But, given the BBC's limitations (6502 processor, limited 32K memory), it's usable and fun and will give you easy entry into a fascinating new aspect of listening.

Derek Douthwaite of Ryhope, Sunderland, writes to ask whether "...in your opinion, the Sony SW100 makes a suitable receiver for s.s.b. utility transmissions?" David explains further; "I have a DX-394 receiver from Tandy's which I use in my shack at home but I travel a lot and, having read of the pocket stations of some of your correspondents, I'd like to try setting up such a station. Having looked at several small receivers, the SW100 looks to be about the best specified but I believe it has only large digital tuning steps not suitable for utility stations? Is it really suitable? Please clarify."

My pleasure, Derek. The Sony SW100 is a truly remarkable set with incredible features built into its tiny case. True carrier reinsertion and sideband syncing are just two of the more sophisticated features usually found only on larger/more expensive receivers. In single sideband mode, the receiver tunes in steps of 50Hz which, while not quite as fine as say, the Lowe HF-225's 8Hz steps (or the Icom PCR1000's incredible 1Hz steps), is fine for the kind of portable, casual listening you're hoping to do. Balanced alongside its other advantages - dimensions smaller than a typical pocket 'tranny', external antenna socket, coverage from l.w. to 30MHz as well as stereo f.m. from 76MHz to 108MHz, scan mode, memories for all your favourite stations, a long operational life from just two AA batteries and, perhaps best of all, a discounted price below £150, you can see that for truly portable operation, there really is no competition. I bought my set at the 1995 Pickett's Lock show, and have enjoyed every moment with it ever since. Hope that helps.

Master Control

OK, sorry, but I couldn't let this instalment of 'ShackWare' pass without mention of Icom's PCR1000. Colin Campbell GM1LUZ E-mailed me with details of his fantastic home-brew freeware (GNU licence) software devoted to controlling the receiver. Colin's web site features several of his programs, which completely bypass the software that comes with the Icom set to control it directly. This makes for a no-frills interface but one which is heavy on highly interesting features such as two windows showing data to and from the receiver, and simple access to baud rate changes, filter steps, and more. As well as the software itself, Colin makes source code for the control software available for download too so that "...others will make use of and improve it". Fascinating stuff and well worth a look. Check out Colin's site at <http://www.campbell84.freemove.co.uk> Colin also sent details of Judson Ahern's excellent web site (<http://hoth.gcn.ou.edu/~jahern/home/pcr1000/>) devoted to things PCR1000, which also features links for software downloads (such as an excellent EEPROM backup program), details of modifications and much more. Well worth a look!



A no-frills interface but lots of interesting features plus source code for examination, Colin Campbell's PCR1000 home-brew control software.

Lost & Found

If, like me, you're an avid catalogue peruser, you'll have seen the little battery-operated active antenna sold through Argos catalogue shops and priced around £15. This device is intended for use with miniature l.c.d. TV sets, but works exceedingly well (so I'm told) with portable and desktop short-wave receivers. Having considered buying one for...well, ever such a long time, I finally steeled myself, plunged into Argos, scrambled for a pen and order form and queued to pay, only to discover that Argos no longer sold it and no, they didn't know where else one could be had. I searched for a while, looked on the shelves at Tandy's and in the Maplin catalogue but finally gave up, cursing that I hadn't bought one when they were available.

Last week however, a copy of the Innovations catalogue dropped through the letterbox. Innovations is the mail-order company (with several high-street gift shops) that sells handy, novelty and weird pseudo-scientific gadgets. A quick flick through the catalogue and there, nestling among the space-saving shoe racks, talking lavatory paper, pet vacuum cleaners and the like, was the miniature active antenna, £14.99. I didn't hesitate. So if you missed it first time around, contact Innovations on (0870) 9087070 with order number QW4415.

Until next time, good listening.

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

Satellite TV News

Whereas established terrestrial TVDXers complain of increased interference, loss of u.h.f. channels with the arrival of terrestrial digital TV and the closure of established Band 1 TV transmitters (rumours of the Madrid ch.E2 end '99 is the latest!), for those involved with satellite reception, the news is of more satellite slots and more channels, though there is the slow demise of analogue (certainly with news feeds) - digital continues to expand! And already in March we can look forward to increased activity at two new slots!

The veteran *Eutelsat II F3* ex 13°E has now arrived at 36°E and already increased activity is being reported, both analogue and digital. As previously mentioned, SNG/teleport downlinks have been seen at 10.926-H, 11.175-H and 11.183GHz-H, and there are increasing numbers of digital downlinks being seen.

John Locker (Wirral) has seen three APTN news circuits in digital between 12.505-12.530GHz-H and **Hugh Cocks** (Algarve) notes a 11.050GHz-H SR 6111; FEC 3/4 downlink caption seeking reception reports! I did a quick scan over this slot late February and flagged up 'SISLINK UKI 264 TEST FRANCE' around the time of the 'peace' talks over Albania/Serbia border incursions, the talks at Rambouillet, France - 11.634GHz-H analogue.

A strong carrier revealed at 11.140GHz-H, SR 27500; FEC 3/4 flagged raster identifying 'MOU'. Later that evening up came the 'Maharishi Open University' caption and a programme on transcendental meditation - this in the clear. The next evening, MOU were still transmitting, but with encryption.

The 11.096GHz-H slot is an active slot. **Roy Carman** (Surrey) commented that March 11th included feeds ex Europe from the United Nations TV via the 'EBU New York Transmit Path 2' and reverse feeds ex ITN ENG were seen of the Lennox Lewis heavyweight boxing fight and the weigh-in/PR event at Madison Square Garden NY, in digital, at SR 5632; FEC 3/4.

Lots of ITN material, rehearsals, etc. flagging up on the digital RX as "8MHz SD1, 2 AUDIO". Even the Iraqi Space Channel is providing programming output - in clear analogue - 10.984GHz-V. At the same orbital slot are the Russian Bonum satellites, and these are visible on a 1-1.2m dish.

I checked both programming and test cards at 12.220; 12.238; 12.295 and 12.468GHz-V though signal levels require threshold extension/i.f. bandwidth reduction to optimise these weak signals. The 36°E slot will allow access into Asia and it may be worth checking on this bird for more exotic inputs when operation becomes more established.

Eutelsat have moved their *II F1* bird a second time, initially from 13°E to 36°E and now back to 21.5°E. Former incumbent at this slot - *Eutelsat I F5* - has now been shunted to 12.5°W and *Eutelsat* are calling this new slot as their 'Atlantic Gate' and this is certainly an expansion of their previous European aspirations. In addition, the old *TV-Sat 2*, bought from the Germans at a knock down price has also been moved to 12.5°W. Their 'Atlantic Gate' will now offer competitively priced Internet, data and television communicators transport into the 'States.

Tied up in this project on the American side is the telecomms group TeleGlobe, who with their teleport have fibre optic linking across the USA - competition in this market which has an excess of capacity will be fierce. This will offer yet another slot to check for signal reception!

The *Eutelsat 7°E* slot for many years was an excellent hunting slot for incoming world-wide feeds and outside broadcasts, but the last 12 months saw that bird - *11 F4* - go into MPEG-2 (4:2:2) which is impossible to resolve on current production domestic digital receivers. As a result, most sat-zappers these days rarely look across the 7°E slot and bypass the bird en-route for greener pastures.

And so on March 7th yours truly was tracking East and happened to stop on 7°E just to see if I could lock up any rare digital video on this bird. And at 2140 hours on this day were two real analogue signals! At 11.157GHz-V colour bars with a small flag top RH corner, no audio, but the signal just cut carrier with no indication of source. Can anyone ID the signal from the fluttering striped flag please?

Just up the band and another analogue signal -11.173GHz-H, was a programme insert feed which remained there for over an hour, the single participant spoke little, which was in any case SIS (sound in syncs, an early digital method of conveying the audio content within the picture syncs). This signal closed and up came the familiar Italian test pattern (white square on a black background) with caption '154 Bologna' - good to know that analogue is still alive and well, even on a dedicated digital bird!

A couple of other unusual analogue sightings via my favourite *NSS/Intelsat K* 21.5°W satellite was March 4 @ 1720 with a caption "Unisat Path 1 (909) 215-9468" via the BT Washington lease - 11.528GHz-H and another on March 9 @ 0725hrs "San Salvatore Path 1" - 11.617GHz-V, this again cut carrier and no news material was seen concerning the reason for this circuit into Europe - perhaps the recent banana wars?

Hugh Cocks has received an interesting satellite - that of the *Afristar* - Worldspace project bringing CD quality radio to Africa late '99 from the bird slotted at 21°E. Making a dipole for 1.5GHz (just under 50mm each leg) and 'dangling it out of the window got noise on an analogue

radio' - Hugh then put the basic dipole into an old Amstrad 600mm Astra dish and signal levels (digital noise) shot up. Check out the 1.477-1.479 and 1.479.5-1.481.5GHz segments. Hugh also has seen very strong Algerian RTA TV signals at 11.720GHz-V in clear PAL (analogue) via *Arabsat 2B* @ 30.5°E, (I couldn't find it here in South UK so the footprint must be tightly spotted into North Africa).

I found an exotic signal - though it was on the *Hot bird* spot @ 13°E - checking out the mass of digital signals one evening and at 12.591GHz-V I found a package that included, amongst other offerings, a Bangkok, Thailand TV station - Thaicom TV-5 - with local news, programming and commercials, all in the Thai language, signing as 'Thai TV5 Global Network' - parameters SR 27500; FEC 3/4.

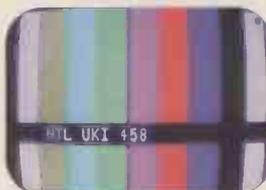
Dean Rogers (London SE2), our sporting expert of the satellite waves, has invested in a Humax digital receiver and finds it an extremely easy receiver to programme, operate and tune. For Italian football fans, check out these regular slots...11.148GHz and 11.190GHz, both H pol, and SR 5632; FEC 3/4 - and 11.137GHz-H SR 6111; FEC 3/4, all carry football via *Eutelsat W2* @ 16°E.

A major Winter sporting event was this year lost to analogue and appeared in MPEG digital, the annual Granada-Dakar car rally. An always interesting and warming event, as the cars race in the sunny desert sands whilst we shiver in the January cold! Dean found the Dakar event carried in the France Telecom package on the 13°E *Hot Bird* slot at 12.380GHz-V.

Also within this package is the *GlobeCast* Paris lease and this carried daily reports with spectacular pictures and aerial shots with links for various broadcast groups such as Speedvision, RTBF, TF1 and Eurosport. There was also an international feed carrying English commentary. Dean also found a new digital news source -



The Dutch amateur TV - digital - via satellite *Eutelsat W2* @ 16°E.



NTL @ 16°E.



Uplink from Mouseville.



WWF feed from Chicago.



NASA-TV and the live launch of 'Stardust' via *NSS/Intelsat K* digital, 7 February. A camera on the side of the rocket shows the launch site receding in the first few seconds of the launch phase.

'ENEX' on the 16°E *Eutelsat W2* at 12.505GHz-H SR 5632; FEC 3/4. Through having access to his restricted upper floor balcony, Dean repositioned his dish and can now access NSS/*Intelsat K* @ 21.5°W and found both *GlobeCast* and *Reuters* feeds.

Another new bird has been found by **Fred Pilkington**, ex

Newmarket and now living on the Spanish (Malaga) coast. He reprogrammed his Nokia 1700 MkII receiver and has found the Ku-band spot beam from *Arabsat-2A*, a Ku + C-band bird which has just been joined in the same orbital slot by *Arabsat-3A* - offering even more Arabic reception potential though in digital.

Arabsat-3A was launched March 5th along with *Skynet 4E*. Fred found various programmes on the 2A spot beam, horizontally

polarised at -

12.250; 12.575 (JRTV Amman); 12.620 (Abu Dhabi); 12.640; 12.668; 12.680; 12.698 (Libya); 12.715 (Saudi Arabia ch.2); 12.735GHz (MBC). Checking out Fred's sightings, the spot beam is too narrow to be seen well in the UK.

Late February and *Eutelsat W2* carried a digital offering of

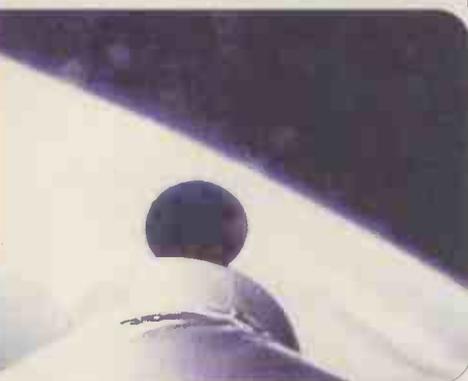
agricultural aggression! Roy Carman checked out his Praxis digital receiver at 11.108GHz-H, SR 5926; FEC 3/4 and resolved pictures of angry Italian farmers with their tractors entering Belgium heavy in their protests after milk quotas had been cut. The baseball hatted 'warriors' ground to a halt and appeared to be setting up cattle pens on the autoroute!

Roy and *Orion-F1* @ 37.5°W February 23, 11.481GHz-V, SR 8750; FEC 7/8 and a date with the Austrian TV service ORF-2. ORF had been in Afghanistan talking with the locals about how things were going now that the Taliban Civil War was drawing to a close. The locals will not criticise the Taliban freedom fighters since they provide the locals with security and their present freedom despite the wreckage of war that surrounds them. The story was the same when the film unit left the sticks and visited Kabul, the capital city of Afghanistan.

In recent weeks, the regular analogue early morning GMTV feeds over NSS/*Intelsat K* seem to have been dropped, last seen as identifying 'SOLO Grantham', 'SOLO Manchr' suggesting that a new SNG uplink facility had moved in from SISLINK, the 11.528GHz-H feed had been used for a very long time. The last sighting ex Manchester was from the Rover's Return.

And finally a quite remarkable sighting, evening of March 12 @ 1900 via *PAS-3R/6* @ 43°W relayed via the SITN, New York facility with excerpts from *The Robin Byrd Show* - a 'sort of singing and exhibitionist show' from "mid town Manhattan" which involved well endowed nude females, male posers with bared genitals - in effect a hard porn musical show! This on 12.698GHz-V in clear analogue!

Later we see the curve of the Earth appear and the rocket exhaust.



The 1st stage is jettisoned as the rocket continues into space.

Orbital News

Intelsat have been carrying out compatibility tests with digital up/downlink equipment that's used within the satellite linking operation. This will ensure that an uplinker in the Congo can pass his signals through to a receiving site in say, Canada, without problem. Intelsat will then provide the definitive handbook of equipment suitable for full interoperability communication across all national boundaries. The tests using equipment from 15 manufacturers is being carried out between Germany and Argentina and provide essential guidelines for ENG facility users.

Talks between Rupert Murdoch's News Corporation Europe, the French TF1 and Canal+ have fallen through, there had been the intention of exploration into a joint media operation but it seems commercial cultures between the respective companies are too widely differing. Murdoch had made attempts of a commercial partnership with the Italian digital Stream operation but the Italian government quickly introduced legislation to limit any co-operative move.

In other merger talks, the Spanish via Digital and Canal Satellite Digital are still far from agreement and with no end in sight to a satisfactory solution. Both TV groups have been spending mega sums on new programme acquisitions.

The Dutch INTRAX SNG operator has been taken over by BT Broadcast Services. The 15 Intrax satellite uplink trucks and flyaway packages will continue to operate as normal with no loss of staff or reduction in equipment.

More expansion by the BBC Prime channel, they have joined the Multi-Choice digital platform in early March covering Northern Africa and airing for 18 hours a day. BBC Prime hope to include the Middle East/Israel in their next expansionist step later in '99 with India and nearby countries in Summer 2000. Discovery Channel have just put their 'People & Art' programme into the Portuguese region gaining 500,000 subscribers.

Back in the '80s, the Australian Broadcast Authority allowed a Rural Area Broadcasting Service to be initiated by satellite to provide programming for local transmitters in small communities, the transmissions in B-MAC. The coverage area was vast, but population coverage minute! The ABA have now relaxed their rules for reception and now anyone that is unable to receive a quality terrestrial TV service can install a receive system for the digital TV packages now available via Optus satellite.

If you're in the outback or a known remote area then you can install a sat receive system without permission. If you live in the middle of Melbourne but suffer inferior quality TV signals, a letter confirming poor reception will provide an Optus-Aurora smart card for your own satellite receive system. Viewers not allowed to receive the Optus signals are those in Western Australia. Programming available includes *Imparja*, ABC national/regional services, TVSN, Horizon and SBS. Typical dish size ranges from 1.2m up to 2m in the Northern Territories.

There are problems, it seems, with the recently launched and slotted *PAS-8* satellite and the 166°E slot. NASA say that it's actually at 166.5°E ie 0.5° out of correct - PanAmSat suggest there's no problem and it's in the correct slot.

Observations noted in the February *SatFACTS* suggest that signal levels are below what they should be and a spot beam into California isn't actually touching this region. The spot beam was essential for trans-Pacific linking of data/Internet, etc. into the Pacific Basin and a good money earner. Sitting at 169°E is *PAS-2* (only 3° or 2.5° separation between *PAS2* and *PAS-8* depending on who you listen to).

The use of a C-band 3m dish is such that the main forward lobe will illuminate the desired satellite when pointed correctly. **But** the first side lobe each side of the main forward lobe is the problem. Depending on which satellite the dish is pointed at, a 3m dish will have its first main side lobe pointing at the adjacent satellite spaced at 3° away and this will result in co-channel interference when frequencies and polarisation are similar. Due to this recently encountered problem, the only answer will be to use still larger dishes to further enhance and sharpen the main forward lobe whilst minimising the side lobe radiation problem.

Into early February observed signal levels had increased, suggesting that fine tuning of the satellite orbital position was ongoing...



During King Hussein's funeral period, Syrian TV helped in uplinking news material from Amman via Arabsat capacity - this the C-band test card.



Jordan TV Channel 2 - English language service - is seen via the Arabic package on Hot Bird 13°E.



A digital news feed via NSS/*Intelsat K* capacity during the King Hussein funeral period.



An unknown test pattern ex USA via 21.5° analogue capacity on 11.528GHz-H, 4 March.



Close down caption via *Eutelsat II F3* @ 36°E digital.



Meditation caption from the MOU programme, 36°E, Feb 24.

■ MIKE RICHARDS G4WNC, PO BOX 1863, RINGWOOD, HANTS BH24 3XD

■ E-MAIL: decode@pwpublishing.ltd.uk ■ Web: <http://www.btininternet.com/~mikespage>

Decode

Hot New Mode

The latest mode to hit the streets is a new amateur system known as PSK31. As the name implies, this is a phase shift keyed mode with some very interesting features. I don't have space to do it justice in the column, so look out for a full description from a

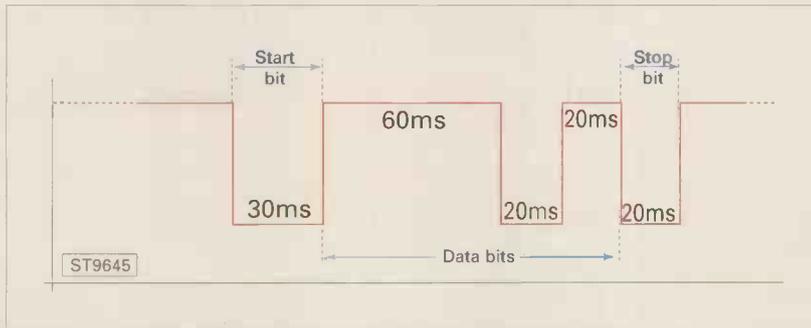


Fig. 1: RTTY Signal Timings and Signal Elements.

'Decode' point of view very soon. If you really can't wait, try taking a look at the PSK31 Web page at: <http://aintel.bi.edu.es/psk31.htm/>

Bits, Bytes & Bauds

Anyone new to decoding, and a few not so new, can be forgiven for getting rather confused when they see speeds quoted in a mix of Bits, Bytes and Bauds. With so few readable textbooks on the subject, listeners often end-up either accepting the confusion, or

maybe guessing the difference. Here I'll make a stab at adding some clarity to this often misunderstood area. As is often the case, in order to properly understand this, we need to take a look at the history.

In the early days of remote communications, speed measurement didn't use bits or bauds, but used the far more logical and friendly words per minute. After all, the links were primarily used to handle text messages, so words per minute seems the right measure to use.

Whilst this was fine for gauging how long a message would take to be sent, it wasn't very helpful for the communications engineers of the time that were looking for more effective ways to communicate.

The engineering fraternity needed a rather more scientific method of measuring and specifying transmission speed. As you can imagine, the early days of telegraphy were exciting

times with lots of people working hard on the challenges of this emerging technology. The term that became the standard was the Baud. This term for transmission speed was named after the French professor Jean M E Baudot, who was born in 1845, and

carried-out important pioneering work on the development of telegraph systems.

The measure itself has been specified by various people since that time and is well described by John E. McNamara in his publication, *Technical Aspects of Data Communication*. The Baud is a "unit of signalling speed equal to the number of discrete conditions or signal events per second". Although this is technically sound, it maybe doesn't make it clear to everyone. What is really meant by the term signalling event is every time the signal changes state, i.e. between a mark and a space.

To find the Baud rate of a system we simply have to measure the maximum number of events every second. Let's use a practical example to illustrate the point. Using the 50 baud RTTY signal I've shown in Fig. 1, you can see that the smallest pulse or condition lasts for just 20ms, that's 0.02 seconds. To convert this to baud rate, we just divide that figure into 1, i.e. $1/0.02 = 50$, thus the baud rate is quoted as 50 baud.

At this point, let's do a quick diversion as this first fact can be used to great effect to help identify unknown signals. When trying to decode an unknown signal, one of the most important first steps is to identify the speed or baud rate of the signal. You will find that most of the automated decoding systems on the market do just that. I'll now show how simple it is to work this out for yourself.

The first step is to use one of the many audio software packages to capture a clean sample of the signal to a .WAV file. Next you need to use a program like *Spectrogram* (see previous 'Decode' columns for details) to take the signal apart and produce a frozen display like that shown in Fig. 2. To keep things simple, I've used a basic 50 baud RTTY signal in the example and the *Spectrogram* settings used were: FFT: 512 points Resolution: 96.9Hz Timescale: 1ms Spectrum Average: 1.

Looking again at Fig. 2, you can see that it's quite easy to spot the smallest blip in the signal (I've arrowed it to make it really easy). All you now need to do is use the Spectrogram cursor to measure the width of this blip in milli-seconds. The conversion to baud rate is done by dividing this figure (in seconds) into 1. With this vital piece of information, you can move onto the next stage of the signal analysis.

In many cases you will find that just knowing the baud rate is enough to guess the entire mode. A good example of this is 192 baud, which is almost certainly an ARQ-E or M variant. Getting back to the point! So what's the connection between these signal 'events' and bit rate?

Let's stick with our RTTY signal for now to keep things simple. In Fig. 1 I've shown a diagram of the various parts of the RTTY signal. If you think back to some of my earlier descriptions, you will recall that RTTY signals use the International Telegraph Alphabet No.2 (ITA2) to convert letters into binary numbers ready for transmission. This particular alphabet uses what's known as a five unit code. That means that each character comprises five binary digits that can be either 1 or 0.

Here's a run down showing how a few letters are represented:

Letter	Code
A	11000
G	01011
H	00101
S	10100
Y	10101
Z	10001

The five binary digits are technically known as bits (Binary digITS), which starts to lead us towards the bit rate that we're looking at. In addition to the five bits that represent the character, you will see

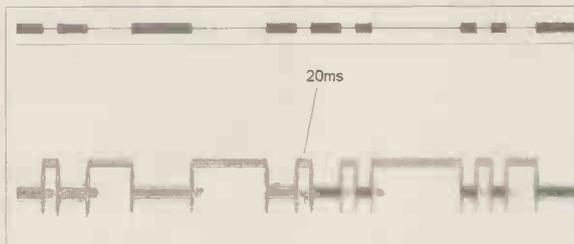


Fig. 2: Spectrogram display of RTTY signal.

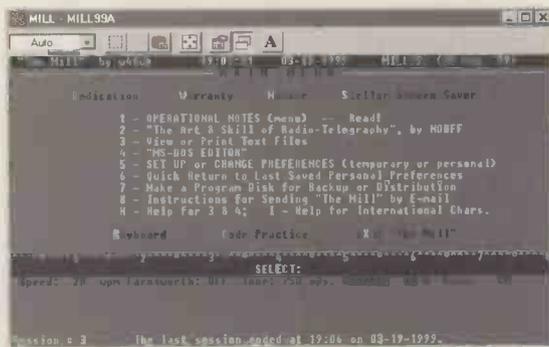


Fig. 3: The Mill Main Menu.



Fig. 4: The Mill Practice Menu.

from Fig. 1 that there are a couple of other 'bits' at the beginning and end of the character. These are known as the start and stop bits and are used to wrap-up the character to help with the decoding process.

Anyway, the important point is that for this signal you should be able to see that the baud rate is actually the same as the bit rate. This signal can therefore be described either as 50 baud or 50bps (bits per second) - both are true. Now that we have the basic definition in place, you can be forgiven for wondering why all the confusion. Things start to get a bit tricky when you take a look at the more modern land-line modems.

Here you will often see speeds of 33.6K or even 56K quoted. In some cases, this is quoted as baud rate. This is generally wrong because the additional speed over a 9600 baud modem is usually achieved through sophisticated coding systems. These systems achieve the much higher bit rate, i.e. they can deliver 33600 bits per second, but the number of signal transitions remains much lower.

It is this simple fact that creates the confusion and misuse of the term baud rate. One other point that causes confusion is understanding the difference between bits and bytes! We already cover the humble bit so what's a byte?

Quite simply a byte is just eight bits! This is done to represent complete characters because many computer systems and codes were based around the use of eight bits to represent characters or audio samples. Because of this, the term byte was a convenient way to quote transmission speed in the number of characters.

If you're an Internet user, then you will probably have wondered why programs such as Netscape and the like always seem to show your download speed as being very slow. It's not really - it's because these programs quote the speed in bytes per second, rather than bits per second.

To convert to bits/second, all you have to do is multiply the figure by 8. If you're lucky, you may find that this conversion shows the data going faster than your modem speed. So, how can this be? Well, this is due to the use of data compression software in the modems that attempts to compress the data before it's sent. As a result you can exceed what is quoted as the maximum speed for your modem

Antiques?

Now for something completely different! Having been around the Decode scene for quite a while now, I thought it might be interesting to see if there are any readers out there that are using 'antique' decoding systems to support their hobby. I don't mean this in any derogatory sense, but would be very interested to hear from anyone that's using an older or particularly unusual system for their decoding.

Perhaps the classic examples would be anyone using an

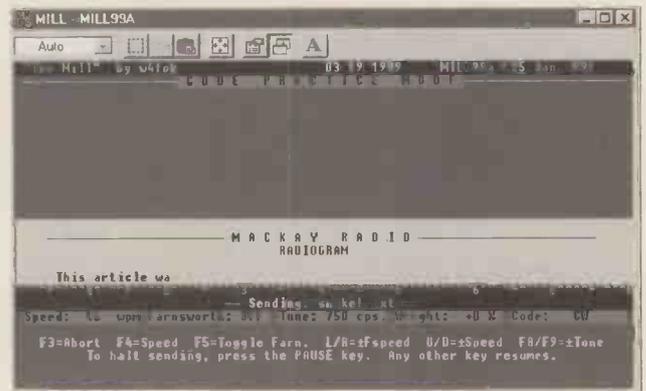


Fig. 5: The Practice Screen.

electromechanical FAX machine to receive weather FAX images. Alternatively, I'm sure there's someone somewhere using an electromechanical teleprinter for RTTY signals. If you are using one of these systems, then I would love to hear from you with as much detail as you can muster on the delights of the systems and the exact equipment you use.

I'd also like to know where you can go for help and spares for these systems. I'm also interested to hear if you're using an old computer system/software and particularly interested if you written any of your own software. If you can help with any info, please either drop me a line or send an E-mail.

Get The Code

Those who read my recent piece on learning the Morse code may be interested in another little gem I found on the Internet. The site to look at is:

<http://www.joates.demon.co.uk/megs/NOHFF/> This link will take you to an on-line version of *The Art & Skill of Radio Telegraphy* by William G. Pierpont NOHFF. This fascinating publication covers the title subject in wonderful detail with lots of historical background.

The presentation of the subject in this way gives the reader a real insight into this fascinating method of communicating. Chapter 30 particularly caught my attention as it describes the Candler system of learning Morse code. Apparently, this was developed by one Walter H. Calder in the early 1900s and was based around the realisation that the 'secret' of high speed Morse decoding rests with the sub-conscious mind.

The theory being that, all the time you have to convert the tones to dots/dashes and then to characters you cannot reach any significant speed. The trick is to bypass the conversion to dots/dashes and go straight from tones to characters.

The only practical way to achieve this is to concentrate on learning the rhythm by making full use of the Farnsworth spacing system. If you're seriously interested in Morse Code, the host site MEGS will prove of great interest. This is the home site of the Morse Enthusiasts Group of Scotland and contains loads of useful information and links to other Morse sites.

One of the sites I visited was 'The Mill', which is the home of the Morse tutorial program of the same name. This is a wonderful DOS based program that includes just about all you need to successfully master learning the 'Code'. Being a DOS based system it makes very few demands on the PC and should run successfully on just about any PC.

As well as providing the basics of random groups of characters, the program supports all manner of interesting refinements including Farnsworth spacing and even an option to use the original American Morse code as well as the International code. Anyway, the program's well worth a try and can be found on Jim Farrior's Web site at: <http://www.net-magic.net/users/w4fok/> The download file is around 570kb in size and expands to approximately 2.7Mb when installed on your hard disk.

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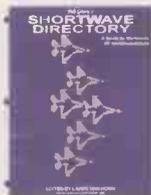
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PUBLISHED on the fourth Thursday of each month by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Printed in England by Southernprint (Web Offset), Factory Road, Upton Industrial Estate, Poole, Dorset BH16 5SN. Tel: (01202) 622226. Distributed by Seymour, 86 Newman Street, London W1P 3LD. Tel: 0171-396 8000, Fax: 0171-396 8002.

Web: <http://www.seymour.co.uk>. Sole Agents for Australia and New Zealand - Gordon and Gotch (Asia) Ltd.; South Africa - Central News Agency Ltd. Subscriptions INLAND £30, EUROPE £35, REST OF WORLD (Airmail) £38, REST OF WORLD (Airmail) £45 payable to SHORT WAVE MAGAZINE, Subscription Department, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. SHORT WAVE MAGAZINE is sold subject to the following conditions, namely that it shall not without the written consent of the publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever.

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