

**The Other Man's Shack
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Posts Examined**

The
SHORT WAVE
Magazine
SWW

& Scanning Scene

DAB REVEALED!

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- *Listening to German Air Force*
- *USAF Galaxy - Selcalls & Tail Numbers*

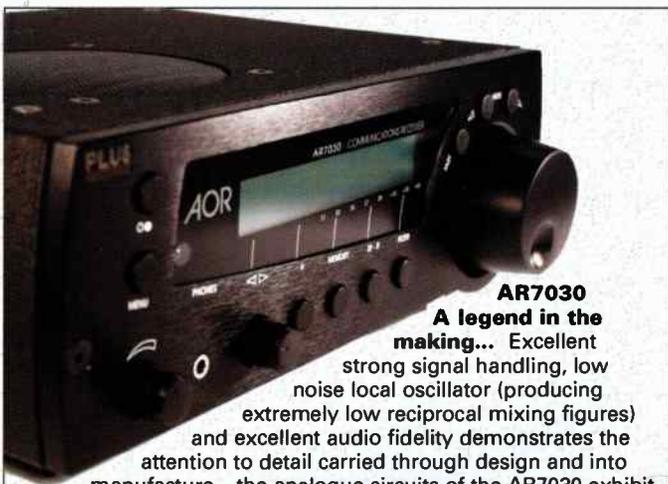
June 2002

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★★★★★ AR7030 awarded five stars by both the authoritative Passport To World Band Radio and World Radio & TV Handbook

'REAL' short wave listening



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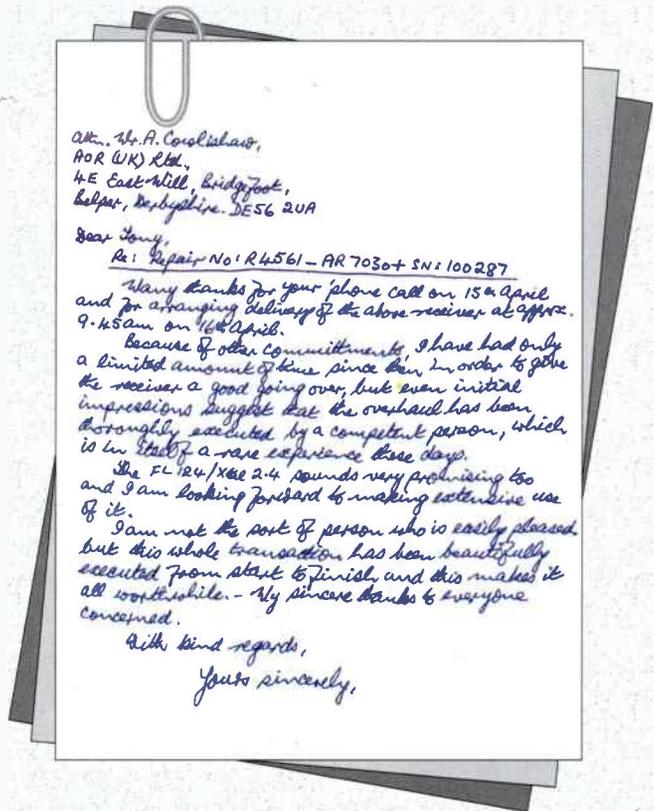
AR5000+3 - Sync AM, AFC, NB

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★★★★★ AR5000+3 awarded four stars by both the authoritative Passport To World Band Radio and World Radio & TV Handbook

XTAL2.4 promotion - a great success, but don't take our word for it !!!

In the April 2002 edition of SWM, AOR DIRECT launched a promotional offer for the **XTAL2.4 SSB crystal filter for the AR7030** receiver along with FL124 daughter board and service / update to the receiver, this included two way carriage - all for **£125 inc VAT**. This offer was truly a bargain as many customers have acknowledged. Reprinted here is a letter received from **VC of Middlesex** who was so impressed with the quality of service and performance, that he has written to express his positive feelings. Since his letter, VC has commented by phone that having further evaluated the performance of the filter (with greater diversity of monitoring), performance is very good with extremely sharp & 'clean' sounding signals at the bottom end of the amateur bands. VC also comments that its nice to receive meaningful after sales support long after the initial purchase... his AR7030 dates from the very first production of the AR7030 in 1996. Presently, we are out of stock of the XTAL2.4 crystal filter (as production was limited in number), however in view of the great success, we are currently exploring the possibility of receiving further supplies. If you are interested in having your AR7030 updated, please call AOR DIRECT.



Extensive product information available from the AOR UK web site. Promotions and special prices for SSL credit card orders.

www.aoruk.com

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The German Air Force (GAF) is easily heard from the UK and much of Europe. Graham Tanner gives an insight into what you might hear, where the signals are coming from, callsign information and much more.

23 THE USAF C-5 GALAXY ON SHORT WAVE - **SSB SPECIAL**

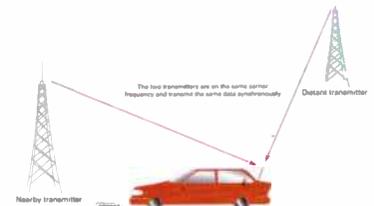
Graham Tanner investigates the allocations of selcalls to the fleet of C-5 Galaxy aircraft operated by the USAF airforce.



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26 PIRATE RADIO

In its early years, radio was just about as hi-tech as space travel is today...but pirate activity really came into its own following World War II. Dave Roberts explains.



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30 DAB REVEALED

Jon Trowsdale G4AXE takes us step by step through Digital Audio Broadcasting.



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This month our whistle stop tour of readers' listening posts takes us to Carmarthenshire in South Wales to the impressive radio room of Dave Jones.

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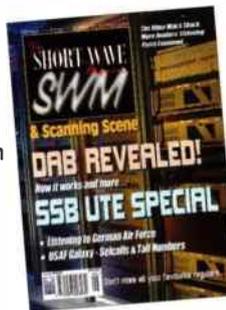
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- * **FREE SCANNING BOOKLET - SCAN 2002**
- * **Scanning Special with Dave Roberts**
- * **JW with three-all-band portables**
- * **Digital Radio via Medium & Short Wave - DRM explained**

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

Photocopies & Back Issues

We have a selection of back issues, covering the past three years of SWM. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for SWM are £3.25 each and photocopies are £3.25 per article.

Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more. UK or overseas. Prices include VAT where appropriate.

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

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Technical Help

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

ED'S comments

New Editorial Radio Truck

I've had a very busy month scraping, cutting and bruising my extremities as a by-product of preparing my recently acquired replacement Editorial transport. My intention is to end up with a go anywhere mobile-radio monitoring station. So far, I've all but completed the vehicle mechanics by replacing spring and dampers with longer uprated variants, fitted strong recovery points and provisioned for deep water wading by the inclusion of a raised air intake for the engine.

Finally, I've fitted an electric winch that can be utilised for a variety of tasks, including mast erection and vehicle recovery, lest I get stuck.

I had quite a surprise when a few weeks ago, I made a 'phone call to Devon based winch specialist David Bowyer to order a suitable set-up for the Discovery. I'd been chatting with David for some time regarding specifications when he got around to asking for my details. To my amazement he announced that not only is he a licensed radio amateur, but he also subscribes to SWM. Small world! Just for David then, a picture of the completed installation is featured on this page. Thanks for the excellent service David.

Next month will see me equipping the cabin for radio, though as you can see, I've already made a start.

WLAN Antenna Testing

I mentioned at the end of last year, that one of the radio clubs local to the SWM Editorial Offices were planning a day of antenna testing. FRARS have now sent me details of their day's proposed activities now that they have decided on a date. If you are interested in attending the Test Day, make the 9th of June a date for your diary!

The activities are due to start around 1000BST although FRARS members will be there from around 0900.

There will be a handful of brief talks on subjects

including microwave propagation and antenna design.

FRARS intend to have a BBQ depending on the weather. They also have access to a great bar on site which serves food and drink, although other pubs and 'eateries' are very near.

To find out how to get to the testing day site, check out the following link

<http://www.frars.org.uk/cgi-bin/render.pl?pageid=110>

If you are a licensed radio amateur, you can call G4RFR via the GB3SC repeater on 145.625MHz if you need talk-in.

Some more information about the Wireless LAN antenna testing day can be found at <http://www.frars.org.uk/cgi-bin/render.pl?pageid=112>

I look forward to meeting you all there on the day.

The FRARS WLAN group <http://www.frars.org.uk/wlan>

Marconi R1475

As we head rapidly for closure of this month's issue of SWM, I received a letter from Steve Haseldine G8EBM. Steve asks if it is possible through the pages of

SWM to appeal for information relating to the R1475 (Type 88). Steve comments that he can find very little information published about the set either in print or via the Internet. He intends to set-up a web site to serve as a global resource for the receiver.

Steve became a fan of the R1475 when 40 years ago he entered amateur radio and was given one. He went on to use it for h.f. listening for many years before passing it on to another user.

Steve is especially keen to hear from anyone who had a hand in designing, maintaining or using the set when they were originally in service with the RAF. He is interested in what role they played and any anecdotes that relate. Steve believes that there are variants that were also used by the Royal Navy and the Canadian Airforce.

Steve makes it clear that he is happy to copy and return any material offered. Anyone who can help should contact Steve direct, via E-mail:

g8ebm@compuserve.com or post at: **Leamington, 3 Burland Green Lane, Weston Underwood, Derbyshire DE6 4PF**. I look forward to announcing the URL for the completed site at some future time.

WU 73 Kevin



QSL



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

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

Radio The Life-Saver!

TOP
QSL

Hi

I want to tell you how radio and SWM has kept me sane. Just over a year ago I was in a deep depression and feeling awful when I noticed a cheap little short wave radio in a local shop. It had some extra bands on that I wasn't familiar with, 'short wave bands' it said, so I bought it. I got it home and started to fiddle with it and of course I came across lots of unfamiliar stations that I soon found out were actually transmitting from other countries! And I could receive them on my tiny little antenna!

It was a struggle to hear a lot of the stations, but I was hooked! That was the thrill, knowing I was receiving something from such a distance. In between the radio stations, I could hear fuzzy voices. I decided to find out what the voices were and why I couldn't tune them in, so I took out a book about radio in the library. Of course, it turned out the voices were radio amateurs. I had to hear them! The book also mentioned *Short Wave Magazine* as a good source of information.

Before you could say 'sidebands' I had a copy of SWM and that was it! All was revealed. An entirely new hobby...no, a way of life, opened up to me. I bought a nice new sideband receiver from one of the advertisers in the magazine and armed with all the excellent articles I was away! My life turned around.

There were so many things to learn and read about I was busy all the time. Now, I have tried most things written about in SWM. I am a short wave listener, I decode SSTV, RTTY, SITOR, PSK31, THROB, I listen to the amateurs, the military, airband and even now receive and decode APT from polar satellites! The list goes on... Needless to say I subscribe to SWM now and will continue to do so whatever happens to radio....

Lee
via E-mail

Lee, I'm very glad to learn that we helped and thrilled to hear that you are enjoying your new found hobby - welcome to the addiction.
- Ed.

Dear Sir

Firstly, being a long term subscriber to SWM, I must congratulate you on publishing such an interesting magazine. I look forward to each issue. Do keep up your excellent work.

Two letters in 'QSL' in March 2002 SWM actually sparked me into writing to you for the first time. I refer to the letters of A.R. LacaR and Michael O'Beirne and issues raised by both. LacaR clearly stated what I have felt for a long time, going back to when I first qualified as a RAF Boy Entrant Telegraphist, namely 'good operators do not have to be engineers' nor do they need to have understanding of radio theory. His letter directs one final question raised in the letter of Michael O'Beirne, namely how to interest the younger generation into our hobby, being radio amateur or s.w.l.

What I suggest will undoubtedly cause the 'old school radio amateurs' to explode with indignation. My solution to generate interest of the younger generation is - **scrap the RAE**. The younger generation do not want the hassle of studying, they do enough at school, college and university. However, I do not want them to get off 'scott free'. I suggest a 'Hands On Apprenticeship' supervised by experienced Radio Amateurs in radio clubs of the area, a licence being granted once the individual clearly shows capability, perhaps after a probation period of two years. Dispense with any radio theory, other than the very basic, nor should the individual be required to display ability to 'construct'. Modern equipment is far too complex to 'play with', in any case, I believe that the percentage within the hobby who still 'tinker' is very low.

I hope that I have not been too extreme in my beliefs as to how we, the older generation, can help the hobby to progress. That is the key word -

progress.

J.R. Fraser
Southport

It's an interesting idea, I guess radical ideas are often the ones that create the genuine progress. Certainly the introduction of 'M3' licences has had a massive effect on amateur activity. - Ed.

Guarantees

Dear Sir

Hilary Humphries in April's SWM puts in a plea that the government surplus dealers give a more extended warranty. Most dealers in fact offer a reasonable money back or exchange deal for a short period, but nothing like the time envisaged by Hilary.

Why Not? Principally, because these goods are not 'surplus' in the original sense in the 1950s when there were vast amounts of brand new war material left over, most of it American. All that went decades ago.

Our government no longer has any 'surplus' radio equipment. Indeed, our troops on the front line in Afghanistan and the Balkans are still relying on ancient Clansman designed in the late 1960s that is on its last legs.

What the dealers get is the old equipment that has been superseded by more modern stuff, and much of it has been well flogged to death. Sets such as the RA1772 are now well over 25 years old and will have been used for months on end on a 24/7 schedule. The fact that they still work so well is a tribute to Racal, but then in 1975 these were state-of-the-art technology and cost a fortune. To build an identical one today would easily cost £15,000.

At government disposal sales, the equipment is sold as seen and no guarantee is supplied to bidders. I have been to several auction viewings and have seen piles upon piles of dusty radios, not to mention enough old boots, berets, webbing, uniforms and Land Rovers to kit out an entire brigade for some impoverished foreign army. A few unused items will appear from time to time such as a brand new Clansman a.t.u., which I once found in amongst a heap of junk, still in its original PVC wrapping, but these are very rare and they get snapped up for resale abroad at elevated prices.

The more cunning auctioneers often combine the items in lots so that to buy that tasty Clansman a.t.u. or the nearly new microwave Hewlet Packard signal generator you have to buy masses of dross as well. The consequence is that bidders inevitably are the dealers who have facilities to sell off the dross and retain the decent items. Even those may not work. Those that do will not be in calibration and none come with any manuals. Professionals in the trade can sometimes obtain copy manuals, but almost never for the tactical military equipment and the specialist surveillance receivers from the likes of Watkins-Johnson and Thomson-CSF. Sometimes, a new manual is almost as expensive as the item itself! It really is pot luck.

It is not surprising that the dealers are in no position to give much of a guarantee. Some such as John's Radio have two prices - tested and untested. In consequence, those who buy at auctions or from the dealers tend to be folk who can service the stuff themselves or are part of a friendly network of users who collectively can usually come up with the paperwork, parts or remedy.

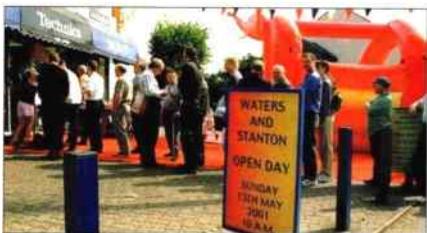
Buying top quality used test equipment is often far safer because it tended to be well treated by highly skilled technicians and used only from time to time, not powered up on a 24/7 basis. Often the only reason for disposal was the introduction of digital technology. My old analogue instruments soldier on accurately with a bit of TLC every now and again.

Michael O'Beirne G8MOB
Surrey

Communiqué

News and Products

W&S Open Day



The date should already be in your diary...yes, it's Waters & Stanton's Open Day - held this year on **Sunday 26th May**. This will be their 12th Annual Open Day and once again their car park will be covered by marquees where W&S will take the opportunity to clear out many items at bargain prices. Icom, Yaesu, Kenwood, Essex Repeater Group and St. Johns Ambulance will all be represented. There will also be a limited number of Morse Assessments available on the day, so anyone interested should contact **Mark Francis** in advance on **(01702) 206835**.

As in previous years, entrance is free, food and drink will be provided free of charge and there will be free local parking with several free raffles with very good prizes. What more could you ask for? Waters & Stanton can be reached at **Spa House, 22 Main Road, Hockley, Essex S55 4QS, Tel: (01702) 206835/204965, FAX: (01702) 205843** or visit www.wsplc.com

Meeting Postponed

The June meeting of the **Chelmsford Amateur Radio Society** has been postponed by a week to avoid clashing with the June Bank Holiday. The 'Constructors Competition' will now take place on **Tuesday 11th June** at 1930 in the Marconi Social Club, Beehive Lane, Great Baddow, Chelmsford. For further information, contact the club secretary **David Bradley M0BQC** on **(01245) 602838** or E-mail: cars@g0mwt.org.uk

Ipswich Rally

The **East Suffolk Wireless Revival** (the Ipswich Rally) is being held on **16th June 2002** at Ransomes Sports & Social Club, Sidegate Avenue, Ipswich. Doors open at 0930 for visitors and 0800 for traders. There will be a Car Boot Sale, Bring & Buy sale, trade stands, Morse assessments, vintage h.f. station, car parking and refreshments (including breakfasts from 0800). Talk-in will be on 2m, channel 522. For further information, contact **Iain G00ZS** on **(01206) 396419** or **John G3XDY** on **(01473) 717830**. Regular visitors to this rally are asked to note that the venue has been changed from last year. The latest details can be found at the ESWR website: <http://www.btinternet.com/~thomassg/eswr2002.htm>

Up & Running

The SWM Newsdesk has recently heard from Doc Burkhart, General Manager of WJIE International, who informs us of their brand new Christian short wave station, which went on the air over the weekend on April 27/28th 2002.

"The new call letters are WJIE (formerly WJCR), and it will begin broadcasting on 7.490MHz, directed toward Europe and Africa, but reaching the world! The tower is located in a little place called Upton, KY. When we were doing our test broadcasts recently, we began to receive 'phone calls from Germany! We were extremely excited!" Doc Burkhart explained.

So, if you have a short wave radio, or know someone who does, please tune in and let them know how the signal is doing. If you have friends overseas that you keep in touch with by E-mail, please ask them to tune in and let them know how well the signal is heard in their part of the world!

When you call or write, be sure to include at what time and where in the world you heard the signal. Also include a return address, and you will be sent a free gift! Reports to: **WJIE Shortwave, PO Box 197309, Louisville, KY 40259, Tel: 502-968-1220, FAX: 502-962-3143, E-mail: wjiesw@hotmail.com** or visit www.wjiesw.com

W&S - Kenwood Winners

Recently Kenwood UK ran a dealer incentive competition amongst the radio communication trade, with prizes offered for the best growth in sales compared to the previous year. The competition was open to all the trade customers of Kenwood UK - this includes the whole of the UK and much of Europe. The challenge was open to both amateur and business radio dealers. Of all the entries, Waters & Stanton were the outright winners in the amateur radio category and came third overall. The Essex based company's success was due to their achievement of a massive 31% increase over the previous year.

"Winning as top amateur dealer took lots of hard work by all our staff. The job was made easier because Kenwood have some great new products in their range and as usual they have high reliability and goods back-up. We aim to stay top dealer this year too", commented Jeff Stanton at the recent prize presentation at W&S' Hockley showroom.



Kenwood Sales Manager **David Wilkins G5HY** (left), presents the achievement certificate to **Jeff Stanton** of W&S.

New SSE Catalogue

Solid State Electronics have a new catalogue now available, free! SSE have been manufacturing high quality electronic products for over 30 years. Some items are available in Europe and the USA, but SSE will try to mail any item anywhere in the world. Catalogue No. 2 contains some quite unique products - there is also a section of r.f. type, etc. - components that are not easy to obtain. For your free copy, contact **Solid State Electronics (UK), 6 The Orchard, Bassett Green Village, Southampton SO16 3NA, Tel: 02380 769598, FAX: 02380 768315, E-mail: solidstate@ssejim.co.uk** or visit www.ssejim.co.uk



BBQ & QRP Night

The **Bangor & District Amateur Radio Society** meet on the 1st Wednesday of every month in 'The Stables', Groomspout, at 2000. On **Wednesday 6th June 2002** they are holding their annual BBQ and QRP evening. The venue for this meeting is the Scout Camp in Crawfordsburn Country Park. This should be a great night with lots of QRP, fun and good food. Visitors and new members are, as always, most welcome. More information from **Mike G14XSF** on **0284-277 2383** or visit the club's website at <http://www.welcome.to/bdars>

RAOTA - Issue 61

The Radio Amateur Old Timer's Association (RAOTA) has just published issue 61 of *OT News* - the magazine for all RAOTA members. The aim of RAOTA is to maintain the traditions and spirit of amateur radio and the contents of *OT News* naturally reflects this aim. *OT News* is also available on cassette tape for those with poor eyesight.

In addition to *OT News*, RAOTA members keep in touch via h.f. nets. The s.s.b. nets are held on Wednesdays at 1100 and on Thursdays at 1100 and 1900 local

time on 3.763 or 3.757MHz. The c.w. nets are held on the first and last Monday in each month on 7.025MHz at 0930; on 3.35MHz at 0930 and on all other Mondays in the month and (as an informal net) on Mondays on 1.835MHz at 2100. RAOTA is also published on the web - see <http://go.to/raota>

For full details of membership, etc., please contact RAOTA's Honorary Secretary **Mrs Sheila Gabriel G3HCQ, Millbrook House, 3 Mill Drive, Bourne, Lincolnshire PE10 9BX.**



SUBSCRIBE & SAVE

As an avid reader of *SWM*, you might like to consider taking out a subscription to *SWM*. By paying up front for your magazine, you

can be assured of never missing out on the latest news and reviews, plus you will be saving money over the period of the year. For example, 12 issues at the current cover price would cost you £39 - but by taking out a subscription, you are **saving £3**. By subscribing to

SWM you also get the extra benefits of checking out the 'Trading Post' bargains first, having Britain's premier radio magazine delivered direct to your door each month and protecting yourself against cover price rises for the duration of your subscription period. To order your subscription, please fill in the **Order Form** on page 70.



Contract Won

Multitone Electronics of Basingstoke have recently won a £300000 contract to manufacture intrinsically safe transceivers for Draeger's PSS Merlin, the first ever fully automated electronic breathing apparatus control system for firefighters. Draeger's new system uses the transceivers for two-way communication of essential safety information between individual firefighters and the Entry Control Officer (ECO), allowing exact monitoring of 12 crew from outside an incident. In the past, this level of communication was not possible: pneumatic data was only available to individual firefighters, and one or two of the crew might be equipped with radios to verbally communicate with personnel outside.

The new system incorporates a control board, portable radio units and Draegerman Bodyguard II, which is an advanced electronic monitoring and signalling device which combines an air pressure gauge, temperature monitor, whistle warning unit and distress unit in a single instrument. The wearer receives constant updates of this pneumatic and safety data, which Bodyguard relays to the PSS Merlin control board, allowing the ECO to receive and acknowledge via the radio transceivers to be manufactured by Multitone. The control board is a battery operated, self-contained unit with a built-in radio transceiver, which receives regular updates of the status of each team member and allows the ECO to give evacuation commands to the whole team or individuals.

For further information: **Multitone Electronics PLC, Multitone House, Beggarwood Lane, Kempshott Hill, Basingstoke, Hants RG23 7LL, Tel: (01256) 320292.**



Draeger's automated breathing apparatus with Multitone's 2-way communications.

RALLIES

May 26: The Spalding & District Amateur Radio Society Annual Rally takes place at the Springfields, Exhibition Centre, Spalding. There will be club and trade stands, refreshments, free car parking, car boot area, tombola and raffle. Overnight camping is available by prior arrangement. **Ray M0CTM** on (01775) 711953 or **John G4NBR** (07946) 302815. Alternatively, visit www.sdars.org.uk

May 26: The Stirling & District Amateur Radio Society are holding a mini radio rally at Menstrie Scout Hall, near Stirling. Doors open 1030. There will be traders, a Bring & Buy and lots more. Check out www.qsl.net/gm6nx. E-mail: bcoan@tiscali.co.uk or telephone **Brendan G4M0BWR** on (01259) 761299.

May 26: The 6th Red Rose QRP Festival takes place at Formby Hall, Alder Street (off High Street), Atherton, Manchester, from 1100 to 1600. There will be trade and club stands, including RSGB, GQRP, FIST, etc., plus a low cost Bring & Buy - all in large spacious halls at ground level. Huge, free car park, disabled facilities, delicious refreshments at QRP prices! Talk-in on S22. Admission is still only £1. Some tables at £5, but please book early. For further details, please contact **Les Jackson** on (01942) 870634 or E-mail: g4hzj@btinternet.com

June 2: The Dover Radio Club Rally/Boot Fair will be held at the Whitfield Village Hall. Doors open at 1000 and close at 1400. Contact **Ian Keyser G3R00** at Rosemount, Church Whitfield, Dover, Kent CT16 3HZ or telephone (01304) 821588 or g3r00@btinternet.com

June 9: The 33rd Elvaston Castle National Radio Rally is located on the Showground at the Elvaston Castle Country Park, near Derby. Admission is £5 per car (inc. passengers) or £15 per coach. For further details contact **Les Bagnall G4CWD** on (01332) 559965 or E-mail: les@g4cwd.demon.co.uk

June 16: The Leeds & DARS are holding their twice yearly traditional outdoor rally and car boot sale at the Yarnbury Rugby Club, Brownberrie Lane, Horsforth, Leeds. More information from **J.A. Mortimer M0JAM** on (01943) 874650.

June 16: The 16th Annual Newbury & District Amateur Radio Society are holding their Boot Sale at Cold Ash, near Newbury. More information from **Mark Slade M0CUK** on (01635) 36444 (day) or visit <http://www.nadars.org.uk>

June 16: The East Suffolk Wireless Revival (the Ipswich Rally) is being held at Ransomes Sports & Social Club, Sidegate Avenue, Ipswich. The rally opens at 0930 for visitors and 0800 for traders. There will be a car boot sale, Bring & Buy sale, trade stands, Morse assessments, vintage h.f. station, car parking and refreshments (including breakfasts from 0800). Talk-in will be on 2m, channel S22. **Iain G00ZS** on (01206) 396419 or **John G3XDY** on (01473) 717830. Regular visitors are asked to note that the venue has changed from last year.

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 any 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.

MLP32 Log Periodic

★ Freq: 100-1300MHz Tx & Rx
★ Gain: 11-13dB
★ Length: 1.40mtr
★ Conn: N-type

£99.95

MLP62 Log Periodic

★ Freq: 50-1300MHz Tx & Rx
★ Gain: 10-12dB
★ Length: 3.00mtr
★ Conn: N-type

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The ultimate receiving antenna - a must for the dedicated listener

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Suitable for MLP Log Periodic or any UHF/VHF beams.

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MD37 SKY WIRE (LONG WIRE BALUN KIT)

25 METRES OF ENAMELLED WIRE INCLUDES 10M PATCH LEAD & INSULATDR For use on with receiver 0-40MHz. All mode no ATU required 2 "S" points greater signal than other baluns. Matches any long wire to 50Ω improved reception.



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MWA HF Wire Antenna Mk11

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



NEW LOW PRICE £49.95

SUPER SCAN STICK

Freq. Range 0-2000MHz Length 1000mm. It will receive all frequencies at all levels unlike a mono band antenna. It has 4 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals. (Ideal for the New Beginner and the Experienced Listener alike).

£29.95

SUPER SCAN STICK II

Freq. Range: 0-2000 MHz. Length 1500mm. This is designed for external use. It will receive all frequencies, at all levels unlike a mono band antenna. It has 8 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals plus there is an extra 3db gain over the standard super scan stick. (For the expert who wants that extra sensitivity).

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5' SWAGED POLES

Heavy Duty Ali (1.2mm wall)
SINGLE 1 1/4"£7.00
SET OF FOUR 1 1/4"£24.95
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BNC (Screw Type)£1.00 each
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N TYPE for RG213£2.50 each
SO239 to BNC£1.50 each
PL259 to BNC£2.00 each
N TYPE to SO239£3.00 each

Hi-Spec coax cable

RG213 9mm mil spec£0.85 per mtr
RH200 9mm mil spec£1.10 per mtr (Phone for 100 mtr discount price)

X1 HF Vertical

★ Freq.: 1.0-50MHz
★ Type: Loaded
★ Height: 2.05mtrs
★ Conn: SO239

£49.95

SCANNING DIRECTORY

8th edition

£19.50

Wideband 25-1800MHz SuperGainer Rubber Duck Antennas

MRW-100 40cm long BNC£19.95
MRW-250 14-41cm long telescopic BNC£19.95
MRW-210 37cm long SMA£24.95 (ideal for Icom IC-R2)

Increase the performance of your hand-held, without an external antenna.

EXWM-1 Window clip mount

★ BNC socket ★ 2.5mtrs mini coax with BNC plug ★ Black finish Suitable for any BNC hand-held antennas!

£13.95

(ADAPTERS FOR OTHER FITTINGS AVAILABLE)

MRP-2000

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

£49.95

WEATHER SATELLITE ANTENNA

TURNSTILE 137 Freq. 137.5 MHz Length 1000mm

This Antenna is designed for external use to receive weather satellite signals. Complete with mounting hardware.

£39.95

SWP HF30

Freq. Range 0.05-30MHz Length 770mm

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

£39.95

MTS42 MOBILE MICRO MAG

Freq. Range 25-2.1 GHz Length 225 mm

£14.95

TRI SCAN III

Freq. Range 25-2000MHz Length 770mm Desk Top Antenna for indoor use with triple vertical loaded coils. The tri-pod legs are helically wound so as to give it its own unique ground plane. Complete with 5mts of low loss coax and BNC plug. (Ideal for Desk Top Use).

£39.95

SWP 2000

FREQ. 25-2000 MHz Length 515mm. Multiband good sensitivity for its small size. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. (Good for the car user who doesn't want an external antenna).

£29.95

SUPER DISCONE

Freq. Range 25-2000MHz Length 1380mm

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

£39.95



HF DISCONE

Freq. Range 0.05-2000MHz Length 1840mm

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

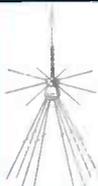
£49.95



ROYAL DISCONE 2000

(Stainless Steel) Freq. Range Receive 25-2000MHz Transmit 50-52MHz 144-146MHz 430-440MHz 900-986MHz 1240-1325MHz Length 1540mm Connector-N TYPE The Ultimate Discone Design. 4.5DB GAIN OVER STANDARD DISCONE! Highly sensitive, with an amazing range of transmitting frequencies, comes complete with mounting hardware & brackets (The Best There is).

£49.95



G. SCAN II

Freq. Range 25-2000 MHz Length 620 mm.

Magnetic mount Mobile Scanner Antenna. 2 vertical loaded coils for good sensitivity complete with magnetic mount and 4mts of coax, terminated with BNC plug. (Good for when you are driving about).

£24.95



ADD £6 P&P PER ORDER



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

■ **E-MAIL:** off.the.record@pwpublishing.ltd.uk

Off The Record

In the March *SWM* Kevin, our Editor, asked the question "Is radio dying?". I certainly look forward to seeing readers' comments. My view is that radio communications is expanding at a rate never experienced before. The real reason for digital radio and TV has little to do with audio or picture quality; the real drive is for the more economic use of the radio spectrum.

Communications technology will in future require more and more band space and if Britain were not to have any to spare, we could be placed at an economic disadvantage to those that have. The frequencies being sought after at present are v.h.f. and above. Alas short wave users are gradually deciding to curtail their reliance on the ionosphere and it's variable propagation properties. International broadcasters are cutting back transmissions to developed countries as they increasingly find the Internet a better and cheaper method of spreading their news and views.

If there is a decline in radio, it could well be in the hobby side of the business as equipment to monitor or communicate with the new modes of communications may become unaffordable for many enthusiasts. One thing that is becoming increasingly evident is that computers are becoming very much more involved in all modes of communication.

Radio Audience Measurement

For just over a decade RAJAR have produced official listening figures for both the BBC and commercial broadcasters in Britain. These statistics involve some 130,000 people completing listening diaries. A new system already used in Europe uses an electronic detector resembling a wristwatch that automatically registers the names of stations the listening team tune to. Carat Media are testing the remote controlled system that has already shown widely differing results to the figures published by Rajar. The radio industry depends very heavily on reliable audience statistics, as staff can be hired or fired and businesses can fold just on the basis of these figures.

SW Pirate DX

From Holland Radio Bandonica advise me they will be using 11.480 during this summer, it's worth trying a channel either side too! Their postal address is **PO Box 663, 7900AR Hoogeveen, Netherlands**. They ask for 1 Euro or \$1 US for the return of an information sheet and a QSL card.

The German pirate, Radio Marabu, have announced they will be broadcast on the Radio Caroline satellite channel every Wednesday morning from 0100 to 0700UTC. Further information is available from **Radio Marabu, Postfach 1166, D49187 Blem, Germany**. On the Internet, they can be found at www.radiomarabu.de

If you happen to be interested in pirate slow scan television, there is a Yahoo Group news list at <http://groups.yahoo.com/group/SSTVCB/> They appear to operate in the 11m 27MHz CB band.

European pirate, Radio Nova, has recently set up an Internet relay station. If you go to their website www.swradiorelay.com you find two channels. One is usually their programme normally broadcast on 7.450MHz and the other is usually different station. American pirate KIPM broadcasts on upper sideband (u.s.b.) on 6.959MHz and has been received with good signals at Otaki Beach in New Zealand. The German Crazy Wave Radio has changed frequencies from 7.480MHz where they experienced interference, mainly from Dutch stations, and are now using 5.810MHz. They are hoping their regular listeners will find them there.

The London based pirate Swinging Radio England is now back on Sundays using their usual 6.276MHz, they had been off air for about a month following a raid which

closed both their medium and short wave frequencies.

On The Air

The Radio Authority has been inviting views of the future of a.m. (medium wave) radio. The consultation is to help the authority with future strategy for the development of medium wave broadcasting. The RA wish to review its attitude to a.m. radio and consider if any licensing or regulatory changes are needed in this area. They also want to take the opportunity to look at the best ways of using these frequencies to benefit radio in the future.

At present, there are 61 licensed a.m. stations regulated by the Radio Authority, two of which are national programmes and 31 are networked Gold services.

From Groningen in Holland, Paul DeHaan is gathering technical information relating to the European offshore pirates with view to writing a book on this subject. The Kent Messenger Group have purchased two more Kentish radio stations one at Tonbridge and another in the Rochester area. The purchase is subject to a Radio Authority public interest test, but would give them five stations in the county.

If you want to listen to UK radio stations outside of your own area and don't mind cheating (no DX), you could try the following on a PC www.radiofeeds.co.uk

Sky Digital and Internet radio station LBH has been placed in receivership, however, it is expected to re-launch as *The Scene*, a logo used extensively by the previous station. As before, it will focus on the UK's gay nightlife, visit www.thesceneradio.co.uk

Another Sky Digital and Internet station to close is *Stormlive* that was run by DJ Bruno Brooks. The reason behind the closure was the lack of credible audience statistics. He will in future be concentrating on a retail radio network for use in branches of newsagent shops, sponsored by *The Sun* and *News Of The World*.

Making Waves

Satellite broadcaster Radio Caroline celebrated their 38th birthday on Easter Sunday with a supposed special live show from their ship the *Ross Revenge*. People did wonder how this was achieved as the vessel is anchored offshore at Queenborough at the Isle of Sheppey and their studio is 20km away near Maidstone. In fact, this special live programme was not really live at all, but had actually been pre-recorded on a mini-disc and driven to the studio beforehand. They have also just started a new fund raising venture called the *Radio Caroline Making Waves Campaign* - this is intended to finance expansion in their satellite service within the UK. Making Waves can be contacted at **2 Moxon Street, High Barnet, Hertfordshire EN5 5TY**.

Letters & Things

Medium wave DX is clearly of interest to **Harry Richards** who writes saying why does Virgin Radio need five frequencies? Well the answer is in the past, the channel we now know as 1215kHz was once an alternative frequency for the BBC Light Programme, their main output was on 200kHz long wave. It was never intended to be the frequency of a national network. It was Radio 1 in 1967 that was given this channel, known at the time as 247metres, which was totally unsatisfactory, but was considered to be a reasonable place to broadcast pop music.

Later Radio 1 moved from 247metres and eventually commercial broadcasters took the channel over. It was given to Richard Branson's Virgin Radio and a lot of money was spent on upgrading and installing higher power Harris transmitters at the main sites. The improvement was minimal and in some respects the increase in power caused even further problems. So in response to this problem, almost 30 repeaters were constructed, all 1kW or less, to cover areas where reception was particularly bad. Apart from 1215kHz, they also operate on 1197, 1233, 1242 and 1260kHz. Bad reception on 1215kHz was one of the reasons why Virgin Radio applied and was awarded an f.m. licence 105.8 in London.



Low Power Radio

In the UK there is a pilot scheme operating at present for low budget broadcasting, there are 15 stations involved each with a year's free licence after the Radio Authority will evaluate the situation. The f.m. stations that have already started seem to be using 50W with a vertically polarised antenna. In the USA they have similar low power f.m. stations that are gradually being established after considerable opposition from the bigger broadcasters. Their stations are licensed for 100W and at present tend to be restricted to smaller towns rather than major cities.

Ever thought of converting your computer into a mini f.m. radio station? The following website www.pcs-electronics.com advertises the hardware and software that allows all of your computers audio to be broadcast anywhere on the standard f.m. band.

The output from the internal board is about 200mW, so without external amplification would only cover a small area. The operation of this type of equipment without a licence in Britain is contrary to the *Wireless Telegraphy Act*.

Pirate's Notebook

Station	Frequency (MHz)
Ozone	6.205
Marabu	6.210
Nova	6.210
Jolly Roger	6.246
UK Radio	6.266
England	6.277
Casablanca	7.120
Ozone	7.435
WMR	7.535
Alpha Lima	15.070

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

LM&S



At midnight on 30 March many of the international broadcasters introduced their new short wave (s.w.) transmission schedules for the period 31 March - 26 October. A considerable number of changes were made to their previous schedules, which rendered 'no longer applicable' a large percentage of the entries in the reports compiled during March for this column. Such entries have therefore been excluded from the data herein to ensure that it is as up-to-date as possible.

Perhaps the most disappointing aspect of the new schedules was the reluctance by almost all of the s.w. broadcasters to take advantage of the propagation conditions prevailing in the 25MHz (11m) band. During the winter there were only two occupants but truly excellent reception of their broadcasts in Asia, Australia & New Zealand was reported in 'LM&S'. Surprising as it may seem, one of them has now decided to cease daily transmissions in the band - see below.

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 March.

During a steamer trip around the coast of Norway between February 27 and March 14 **Michael Wasley** (Scunthorpe) searched the l.w. & m.w. bands at times with a Grundig Yacht Boy 400 portable. As expected, reception in his cabin proved to be virtually impossible, so he tried to find an electrically quiet location on deck. The spot he finally chose was without lights, so reception had to take place during daylight. On February 27 he checked this band between Stavanger & Haugesund from 1400 until 1600UTC and logged ten stations - see chart. BBC R-4 via Burghead (50kW) on **198kHz** rated SINPO 42322. Whilst near Trondheim on March 4 he picked up a broadcast from Ríkisutvarp (RUV) in Reykjavik, Iceland via Gufuskalar, W.Iceland (300kW) on **189kHz**; also via Eidar, E.Iceland (100kW) on **207kHz**, which rated SINPO 24243 and 24233 respectively at 1030.

Reception in the far north of Norway near Kirkenes on the 8th proved to be disappointing, with only Ingoy, Norway heard on **153kHz** at 1230. He would have found it interesting to try some night-time listening up there, but the temperature was about -10°C and there was a gale blowing, which dampened his enthusiasm - he had to forego dinner that evening too! Down in Bergen on the 14th he logged BBC R-4 on **198** and Team Talk via Clarkestown on **252** as 44444 at 1500; also some others - see chart.

Unusual conditions were observed in the early hours of the 17th by **Ernie Strong** (Ramsey, Cambs) when the 1.2MW transmitter at Chita, Siberia on **180kHz** became audible for about twenty minutes. Male speech and loud classical music was heard. At 0115 he rated the transmission 12131. At that time SaarLouis was carrying speech.

Further to Ernie's report of an unknown station under Roumoules on **216kHz** ('LM&S', SWM February '02) and subsequent suggestions from two contributors that it might be the result of the 'Luxembourg effect' ('LM&S', SWM April '02), Ernie decided to carry out further checks along the lines suggested. He says "After several days of listening I could not recognise the background station on 216kHz as a signal riding in from any other part of the long wave band. So I still believe that, as mentioned previously, ('LM&S', SWM May '02) it is the low power station at Oslo." Commenting upon the saga so far, **Sheila Hughes** (Morden) says "I too have heard a signal under Roumoules sometimes. All very interesting, but too complicated and technical for me to pass an opinion."

after midnight and a few were received during daylight - see both m.w. charts. He used the same high performance home-built crystal set plus 40m random wire antenna as last year, with frequencies and stations identified, where necessary, with a Roberts R809 portable.

The BBC R-4 transmission from Crystal Palace on **720**, which replaced Lots Road, was mentioned in several reports. During daylight it was rated SIO 333 by **George Millmore** in Wootton, IOW; 22242 by **Vic Prier** in Colyton, Devon; 43433 in Ramsey, Cambs; 34444 by **Fred Wilmshurst** in Northampton. After dark, reception was either difficult or impossible due to the sky waves from other stations.

Whilst enjoying his steamer trip around the coast of Norway **Michael Wasley** picked up a number of broadcasts in the m.w. band during daylight - see both charts. He says "Hearing BBC R.Wales in Trondheim was a bit of a surprise!" Only one UK local radio station was mentioned in his report - BBC R.Newcastle on 1458, which he heard near Stavanger and rated 24242.

Searching the band for distant local radio stations was an activity enjoyed by some other listeners - see chart. Commenting upon this aspect of our hobby, **Sheila Hughes** says "Local radio is becoming more and more of a challenge I think, especially in the after dark hours and dusk with the strong signals from Spanish stations on some frequencies. I was pleased to log BBC R.Merseyside and listen to their 'phone-in.'" Sheila rated their transmission on 1485 as 23333 at 2303. She was listening to that station earlier - it was under ILR Classic Gold 1485, Newbury at 2220, but a stronger signal just after 2300UTC.

Short Wave Reports

Since the introduction of the 'summer' broadcast schedules on March 31st Deutsche Welle (DW), Germany have discontinued their usage of the **25MHz (11m)** band to reach listeners in Asia. No doubt their broadcasts on **25.740** (Ger 0800-1400) will be missed by many listeners, especially in Asia, Australia and New Zealand because reports to this column have indicated truly excellent reception in those areas.

The only known broadcaster now taking advantage of the propagation conditions in this band is Radio France International (RFI) on **25.820** (Fr, Eng to E/C.Africa 0830-1300). During the early days of the present sunspot cycle their service planning engineers had the foresight to include this band in their transmission schedules and their long usage of it is a great credit to them.

The RFI transmissions are beamed away from the UK, consequently the reception of them here is dependent upon back scatter and other unreliable modes. The SINPO ratings quoted in the latest reports from listeners in the UK were 33433 at 0930 in Colyton; 44434 at 1057 by **Thomas Williams** in Truro; 25332 (with a pronounced echo) at 1144 by **Fred Pallant** in Storrington; 44343 at 1210 in Newry; 35333 at 1245 by **Bernard Curtis** in Stalbridge; 15521 to 35422 [sometimes with echo] at 1245 by **Simon Hockenull** in E.Bristol; 35433 at 1255 in Northampton.

In the **21MHz (13m)** band R.Australia's early morning transmission to Pacific areas from Shepparton on **21.725** (Eng 0200-0900) has been received quite well in Europe. It was rated 35553 at 0525 by **John Parry** in Larnaca, Cyprus and 44444 at 0826 by **Rhoderick Illman** in Oxted. From 0900 their broadcast to Asia via Shepparton on **21.820** (Eng 0900-1400) has often reached the UK. It was noted as 44444 at 0900 by **Gerald Guest** in Dudley and 33333 at 1310 in Truro. Much later, their transmission from Shepparton on **21.740** (Eng to Pacific areas) was 23411 at 2140 in E.Bristol.

Also mentioned in the reports were Swiss R.Int via Sottens **21.750** (Fr, Ger, It, Eng to Near East, Africa 0600-0800), rated 43444 at 0754 by **Vera Brindley** in Woodhall Spa; Swiss R.Int via Sottens **21.770** (Eng, It, Ger, Fr to Near East, Africa 0830-1030) 44433 at 0840 by **Stan Evans** in Herstoncoaux; R.Japan via Yamata, Japan **21.755** (Jap to Oceania, Australasia 0800-1000) 43423 at 0830 in Colyton; HCJB Quito, Ecuador **21.455** (Eng [u.s.b.] 45444 at 1200 in Northampton; BBC via Ascension Is **21.470** (Eng to S.Africa 1300-1900) 33233 at 1400 in Stalbridge; Channel Africa via Meyerton, S.Africa **21.725** (Eng to W.Africa 1300-1455, Sat/Sun) 44344 at 1440 by **David Hall** in Morpeth; DW via Wertachtal? **21.840** (Ger to Africa, S.Asia 1600-1645) 44444 at 1600 in Morden; WYFR Okeechobee, USA **21.525** (Eng to Africa, S.Asia 1600-1700) 44444 at 1651 in Woodhall Spa; R.Nederlands via Bonaire, Ned.Antilles **21.590** (Eng to CW.Africa 1830-2025) 24122 at 1830 in Newry.

A few broadcasters are continuing to use the **18MHz (15m)** band to reach listeners in chosen areas. They include R.Sweden **18.960** (Eng to N.America 1230-1300, 1330-1400, 1430-1500), rated 34222 at 1330 in Newry; Family R, WYFR via Okeechobee FL, USA **18.980** (Eng to Eur, Africa 1600-2200) 44444 at 1700 in Morden & 44444 at 2000 in Colyton; Christian Science Herald via WSHB Cypress Creek **18.910** (Fr, Eng to E/S.Africa 1600-2100?) 44434 at 1644 in Woodhall Spa & 34333 at 2010 in Stalbridge.

Good reception from many areas has been noted in the **17MHz (16m)** band by listeners in the UK. R.Australia's broadcast to Asia via Shepparton on **17.750** (Eng 0000-0500, 0600-1100) was rated 34433 at 0710 in Morpeth, 44333 at 0730 in Morden & 25422 at 0938 in E.Bristol. Much later, their transmission to Pacific areas & N.America from Shepparton on **17.715** (Eng 2100-0000) was 34232 at 2108 in Newry.

Many other broadcasters are taking advantage of the propagation conditions in this band. During the late afternoon and evening they include Israel R, Jerusalem **17.545** (Eng to Eur, N.America 1600-1630), rated 44444 at 1625 in Woodhall Spa; Channel Africa via Meyerton **17.870** (Eng to W.Africa 1800-1830) 34443 at 1800 in Storrington; VOA via Morocco? **17.895** (Eng to Africa ?-1900) 45544 at 1655 in Northampton; BBC via Ascension Is **17.830** (Eng to W.Africa 0700?-2100?) 34233 at 1920 in Colyton; World Harvest R. (WHRI) via Maine, USA **17.650** (Eng to Eur, M.East, Africa 1600-2300?) 33343 at 1955 in Larnaca, Cyprus & 44333 at 1955 in Truro; HCJB Quito, Ecuador **17.660**

Listeners:-

- (A) Simon Hockenull, E.Bristol.
- (B) Sheila Hughes, Morden.
- (C) Eddie McKeown, Newry.
- (D) George Millmore, Wootton, IOW.
- (E) Fred Pallant, Storrington.
- (F) Ernie Strong, Ramsey, Cambs.
- (G) Michael Wasley, while in Bergen, Norway.
- (H) Michael Wasley, near Kirkenes, N.Norway
- (I) Michael Wasley, between Stavanger & Haugesund, Norway.
- (J) Michael Wasley, near Trondheim, Norway.
- (K) Thomas Williams, Truro.
- (L) Fred Wilmshurst, Northampton.

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	F*
153	Donebach DLF	Germany	500	A,B,C*,D*,E*,EG,LL
153	Ingoy	Norway	100	H,J
153	Bod	Romania	1200	F*
162	Allouis	France	2000	B,C*,D*,E*,F,G,I,J,K*,L
171	Nador Medi-1	Morocco	2000	F*
171	B'shakovo etc	Russia	1200	C*,D*
171	Lvov	Ukraine	500	F*
177	Oranienburg	Germany	500	A,C*,D*,E*,F,G,I,J
183	SaarLouis	Germany	2000	B,C*,D*,E*,F,I,K*,L
183	Chita	Siberia	1200	F*
189	Gufuskalar	W.Iceland	150	A*,C*,F*,J
198	Droitwich BBC	UK	500	B,C*,D*,FL
198	Burghead BBC	UK	50	G,I,J
207	Munich DLF	Germany	500	A,C*,D*,E*,F,I,K*,L
207	Eidar	E.Iceland	100	C*,J
207	Azilal	Morocco	800	F*
207	Kiev	Ukraine	500	F
216	Roumoules RMC	S.France	1400	A,B,C*,D*,E*,EG,LL
225	Polskie R-1	Poland	?	A*,B,C*,D*,E*LL*
234	Beidweiler	Luxembourg	2000	C*,D*,E*,FK*,L
243	Kalundborg	Denmark	300	A,B,C*,D*,E*,F,I,J,L
252	Tipaza	Algeria	1500	D*,F
252	Team Talk 252	Eire	500	C*,D*,E*,F,G,I,J,L
261	Burg(R.Ropal)	Germany	85	A*,C*,D*,E*,F
261	Taldom Moscow	Russia	2500	A*
270	Topolna	Czech Rep	1500	A*,B*,C*,D*,E*,FL
279	Sasnovy	Belarus	500	A*,B*,C*,D*,E*,FL

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

Medium Wave Reports

The sky waves from quite a few of the many m.w. stations in the Middle East, N.Africa, Europe and Scandinavia were picked up after dark by some listeners in the UK - see chart.

An unidentified station with a broadcast in Italian on **702kHz** was heard at 2205UTC by **Sheila Hughes**. She says "I have checked this at other times - also in Italian. It doesn't sound like a religious programme to suggest TWR." Over in Co.Down, **Eddie McKeown** (Newry) logged it as TWR Monte Carlo, Monaco at 2121, so it may be worthwhile to listen at that time and to stay tuned until after 2200 to see if there is a break or change of level in the carrier. Eddie also noted Flensburg, Germany on **702** at 2122. Both rated 22222.

Regular readers of this column may remember the remarkable results which **Philip Miller Tate** (Walton-on-Thames) obtained with a crystal set during a DX contest last year. This year, the fourth 'Elmer' crystal set DX contest was held a little later than in previous years. Philip was away in the USA during part of the contest week so he was unable to take part until the evening of March 22. The majority of the 67 stations noted in his interesting log were heard during the evenings of March 22, 23, 24 & 25, but some were logged

(Eng to Eur 2000-2200) 43334 at 2000 in Stalbridge; VOA via Philippines? **17.820** (Eng to Far East 2100-2200) 44334 at 2100 in Dudley; Voz Cristiana, Chile **17.680** (Sp to S.America 12007-00007) 44433 at 2308 in Oxted.

Good reception over long distances has been noted in the **15MHz (19m)** band. During the early morning R.New Zealand's 100kW transmission to Pacific areas on **15.340** (Eng 0500-0800) was rated 45544 at 0610 in Larnaca, Cyprus & 33233 at 0630 by **Clare Pinder** in Appleby. Much later, their broadcast to Pacific areas on **15.160** (Eng 1850-2050) was 35543 at 1925 in Larnaca, Cyprus & 44444 at 2012 in Woodhall Spa.

The broadcasts from R.Australia have also been reaching the UK. Two frequencies from Shepparton were mentioned in the reports: **15.415** (Eng to E/SE Asia 0600-0900), rated 32423 at 0815 in Colyton; **15.240** (Eng to Pacific, E.Asia 0000-1000), 34333 at 0805 in Morpeth & 44433 at 0830 in Herstmonceux.

Also received during the morning were Swiss R.Int via Julich, Germany **15.445** (Fr, Ger, It, Eng to Near East, Africa 0600-0800), rated 34333 at 0750 in Woodhall Spa; KTWR Guam, Pacific **15.330** (Eng to Asia 0815-0930) 43333 at 0830 in Morden; Voice of Greece, Athens **15.630** (Gr, Eng to Eur? 0900-1000) 44444 at 0950 in Northampton; WERN Vandiver, USA **15.745** (Eng to Eur, Africa 1000-?) 45444 at 1005 in Northampton.

Later, VOA via Botswana? **15.445** (Eng to Africa ?-2200) was 53444 at 1945 in Stalbridge; China R.Int via ? **15.110** (Eng to Eur 2000-2100) 44444 at 2000 in Dudley; Voice of Indonesia, Jakarta **15.150** (Eng to Eur, M.East 2000-2100) 45434 at 2007 in E.Bristol; R.Canada Int via Sackville? **15.325** (Fr, Eng to Eur?) 44444 at 2132 in Storrington; R.Taipei Int via WYFR **15.600** (Eng to Eur 2200-2300) 34222 at 2230 in Newry; VOIRI Tehran, Iran **15.084** (Home Sce relay) 44434 at 2352 in Oxted.

The occupants of the **13MHz (22m)** band now include R.Nederlands via Irkutsk (Eng to Asia, Far East, Pacific 0930-1130), rated 34232 at 1040 in Newry; Croatian R, Zargreb **13.830** (Cr to Eur) 35422 at 1310 in E.Bristol; UAE R.Dubai **13.675** (Eng to Eur, Africa 1330-1350) 54544 at 1345 in Herstmonceux; Voice of Vietnam, Hanoi **13.740** (Eng, Fr to Eur 2030-2130) 53445 at 2040 in Stalbridge; R.Australia via Darwin **13.620** (Eng to SE Asia 2200*-0000 [* often starts late]) 44333 at 2200 in Morden; WWCN Nashville, USA **13.845** (Eng to Africa 1900?-0100?) 33333 at 2213 in Storrington.

R.New Zealand may be heard in the **11MHz (25m)** band in the UK. During the morning their broadcast to Pacific areas on **11.675** (Eng 0800-1100) was rated 32432 at 0819 in E.Bristol & 33333 at 1100 in Truro. It is followed by a special programme to NZ forces in Bougainville, the Solomon Is and E.Timor on **11.675** (Eng 1100-1300), noted as 22222 at 1300 in Truro.

R.Australia's broadcasts have also been reaching the UK in this band. Two frequencies from Shepparton were mentioned in the reports: **12.080** (Eng to Pacific areas 0000-0900), rated 24332 at 0827 in Oxted; **11.660** (Eng to Asia 1430-1700) 44333 at 1430 in Morpeth & 34422 at 1545 in E.Bristol.

Another long haul for listeners in the UK is World Harvest R, via

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	Dxer	Freq (MHz)	Station	Country	UTC	Dxer
3.255	BBC via Meyerton	S.Africa	2205	B,E	4.840	AIR Bombay	India	0045	B,G,K
3.270	Namibian BC, Windhoek	Namibia	1931	H,J	4.845	DRTM Nouakchott	Mauritania	1943	G,H,J,K
3.280	R.Huari Pycucho	Peru	0613	K	4.860	AIR Delhi	India	1834	G,H,J,K
3.300	R.Cultural	Guatemala	0410	B,J,K	4.865	AIR Kingsway(Feeder)	India	2015	B
3.316	SLBS Goderich	Sierra Leone	1930	H,K	4.865	R.Missoes, Amazonia	Brazil	0649	K
3.320	SABC (RSG) Meyerton	S.Africa	1929	H,K	4.865	R.Clube do Para	Brazil	0012	B,D,G,K
3.330	Dndas del Huallaga	Peru	0310	B	4.905	Pakistan BC	Pakistan	1608	H
3.365	GBC R-2	Ghana	2105	B,H,K	4.900	SLBC Colombo	Sri Lanka	1719	K
3.365	AIR Delhi	India	1824	H,K	4.905	Anhanguera	Brazil	0014	D
3.915	BBC via Kranji	Singapore	2100	B,E,G,K	4.905	CPBS T, Beijing	China	2343	G
3.945	AIR Gorakhpur	India	1708	K	4.910	AIR Jaipur	India	1657	B,G,H,K
3.950	Qinghai PBS, Xining	China	0050	B,D	4.915	R.Anhanguera	Brazil	0645	B,D,J,K
3.955	R.Korea via Skelton	England	2100	A,C,G,I,M	4.915	GBC-1, Accra	Ghana	2130	G,H,J,K
3.955	R.Taipei via Skelton	England	1800	C,E,G,I,J,M	4.915	KBC Cent Sce Nairobi	Kenya	1827	H
3.965	RFI Paris	France	1903	E,G	4.920	R.Quito, Quito	Ecuador	0445	B,D,K
3.975	R.Budapest	Hungary	2100	C,E,G,J,M	4.920	AIR Chennai	India	1651	D,H,K
3.985	Nexus, Milan	Italy	1929	E,G,J,M	4.925	R.Difusora, Taubate	Brazil	2200	G
3.995	DW via Julich?	Germany	2107	E,F,G,L	4.930	AIR Shimla	India	1828	H,J
4.005	Vatican R	Italy	1930	G,J,L	4.935	KBC Gen Sce Nairobi	Kenya	1708	H
4.460	CPBS 1, Beijing	China	2205	B	4.940	AIR Gwahati	India	1642	H
4.500	Xinjiang BS, Urumqi	China	0005	D	4.950	AIR Srinagar	India	0040	B
4.716	R.Yura, Yura	Bolivia	0105	B	4.950	VDA via Sao Tome	Sao Tome	2009	B,G,H,J,K
4.750	N. Menggu PBS, Hailar	China	2302	K	4.960	R.Cima	Dominican Rep	2325	K
4.755	R.Educ CP Grande	Brazil	2304	K	4.960	VDA via Sao Tome	Sao Tome	0544	K
4.760	ELWA Monrovia	Liberia	1937	G	4.965	Christian Voice	Zambia	1806	H,J,K
4.765	R.Rural, Santarem	Brazil	2314	K	4.975	R.Mundial, Sao Paulo	Brazil	0855	K
4.770	FRCN Kaduna	Nigeria	2241	G,J	4.975	R.Pacifico, Lima	Peru	0609	K
4.775	R.Liberal, Belem	Brazil	2315	K	4.975	R.Uganda, Kampala	Uganda	1917	B,G,H,J,K
4.783	RTM Bamako	Mali	2210	B,K	4.980	Ecos del Torbes	Venezuela	2328	B,G,K
4.790	AIR Itanagar	India	0008	D	4.985	R.Brazil Central	Brazil	2345	B,D,G,K
4.790	Azad Kashmir R.	Pakistan	1711	B,K	4.990	FRCN Lagos	Nigeria	0623	K
4.796	R.Mallku	Bolivia	0145	B	5.009	R.TV Malagasy	Madagascar	1653	H
4.800	CPBS 2 Beijing	China	2317	B,G,K	5.010	AIR Thiruipuram	India	0049	B,G
4.800	AIR Hyderabad	India	1713	K	5.012	R.Cristal Int	Dominican Rep	2337	K
4.805	R.Nac. Amazonas	Brazil	2325	B,L	5.025	R.Rebelde, Habana	Cuba	0435	B,D,K
4.820	R.Botswana, Gaborone	Botswana	2000	B,J	5.025	R.Uganda, Kampala	Uganda	1909	K
4.820	Xizang, Lhasa	China	2016	B,G	5.030	AWR Latin America	Costa Rica	0700	B,D,K
4.820	La Voz Evangelica	Honduras	0615	B	5.030	RTM Kuching	Sarawak	1945	J
4.832	R.Litoral, La Ceiba	Honduras	0420	B	5.035	R.Aparecida	Brazil	2340	K
4.835	RTM Bamako	Mali	1943	B,G,H,J,K,L	5.035	R.Bangui	C.Africa	1910	K
					5.040	Jeyapore	India	1724	K
					5.050	R.Tanzania	Tanzania	1936	B,H,J,K
					5.060	PBS Xinjiang, Urumqi	China	0045	B,K

KWHR Hawaii on **11.565** (Eng to Australia 0500-1600?), noted as 33333 at 0757 in Woodhall Spa.

Much later, R.France Int via ? **11.615** (Eng to Africa 1600-1730) was 45544 at 1630 in Northampton; Voice of Greece, Athens **12.105** (Eng to Eur 1830-1900) 55455 at 1830 in Newry; Israel R, Jerusalem **11.605** (Eng to Eur, N.America 1900-1930) 44444 at 1910 by **Peter Pollard** in Rugby; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800?-2100?) 55445 at 1940 in Stalbridge & 44434 at 2030 in Colyton; VOIRI Iran **11.670** (Eng to Eur 1930-2030) 43333 at 2000 in Morden; China R.Int via ? **11.790** (Eng to Eur 2000-2100) 44334 at 2000 in Dudley; R.Tashkent, Uzbekistan **11.905** (Eng to Eur 2030-2100) 44323 at 2030 in Morden.

In the **9MHz (31m)** band R.Australia has been received in the UK on the following frequencies from Shepparton: **9.710** (Eng to New Guinea, Pacific areas 0800-0900), rated 34423 at 0840 in Colyton; **9.500** (Eng to Asia, Eur 1900-2130) 33433 at 2002 in Storrington.

Other broadcasters using this band during the morning include WTJC Newport NC, USA **9.370** (Eng to N.America 24hrs), rated 44444 at 0738 in Morpeth R.Nederlands via Bonaire, Ned.Antilles

Dxers:-

- (A) Bernard Curtis, Stalbridge.
- (B) Jim Edwards, Wigan.
- (C) Stan Evans, Herstmonceux.
- (D) David Hall, Morpeth.
- (E) Simon Hockenhill, E.Bristol.
- (F) Rhoderick Illman, Oxted.
- (G) Eddie McKeown, Newry.
- (H) Fred Pallant, Storrington.
- (I) Clare Pinder, while in Appleby.
- (J) Vic Prier, Colyton.
- (K) Richard Reynolds, Guildford.
- (L) Thomas Williams, Truro.
- (M) Fred Wilmshurst, Northampton.

Listeners:-

- (A) Simon Hockenhill, E.Bristol.
- (B) Sheila Hughes, Morden.
- (C) George Millmore, Wootton, IoW.
- (D) Ernie Strong, Ramsey, Cambs.
- (E) Michael Wasley, between Stavanger & Haugesund.
- (F) Fred Wilmshurst, Northampton.
- (X) Philip Miller Tate, Walton-on-Thames.

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
558	Spectrum, London	I	0.80	A,C,D,FX*	1359	Breeze, Chelmsford	I	0.28	D
603	C.G.Lit'brne	I	0.10	C,D,FX*	1359	CI.Gold 1359, C'try	I	0.27	D,F
630	R.Bedfordshire(3CR)	B	0.20	A,B,C,D,F	1359	R.Solent,Bournemouth	B	0.85	C
630	Asian Netwk via 3CR	B	0.20	X*	1368	R.Lincolnshire	B	2.00	B*,D,F
630	R.Cornwall	B	2.00	C	1368	Southern Counties R	B	0.50	B*,C
657	R.Ciwyd	B	2.00	C,D,F	1368	Wiltshire Sound	B	0.10	C
657	R.Cornwall	B	0.50	C	1413	R.Gloucestre via ?	B	?	D,F
666	CI.Gold 666, Exeter	I	0.34	A,C,D,F	1413	Premier via ?	I	0.50	D,X*
666	R.York	B	0.80	D	1413	Fresh AM, Skipton	I	0.10	D*
729	BBC Essex	B	0.20	C,D,F	1431	CI.G Breeze Southend	I	0.35	D
738	Hereford/Worcester	B	0.037	A,B,C,D,F	1431	CI.Gold, Reading	I	0.14	B*,C,F
756	R.Cumbria	B	1.00	D	1449	Asian Netwk,Peterbro.	B	0.15	D,F
756	The Magic 756,Powys	I	0.63	A,C,D,F	1458	R.Devon	B	2.00	C
765	BBC Essex	B	0.50	C,D,F	1458	R.Newcastle	B	2.00	E
774	R.Kent	B	0.70	C,D,F	1458	Sunrise, London	I	50.00	C,D,FX*
774	CI.Gold 774, Glos	I	0.14	C,F	1458	Asian Netwk Langley	B	5.00	D,F
792	CI.Gold 792, Bedford	I	0.27	C,D,F	1485	CI.Gold, Newbury	I	1.00	A,B*,D,F
801	R.Devon	B	2.00	A,C,D	1485	R.HumberSide (Hull)	B	2.00	D
828	CI.Gold 828, Luton	J	0.20	D,F	1485	R.Merseyside	B	1.20	B*,C,D
828	Asian Netwk Sedgley	B	0.20	F	1485	Southern Counties R	B	1.00	B,C
828	CI.G 828 Bournemouth	I	0.27	C	1503	R.Stoke-on-Trent	B	1.00	B,D,F
837	R.Cumbria/Furness	B	1.50	D*	1521	Breeze, Reigate	I	0.64	A*,C,D,F
837	Asian Netwk Leics	B	0.45	C,D	1530	R.Essex, Southend	B	0.15	D
855	R.Devon	B	1.00	C	1530	CI.Gold, Worcester	I	0.52	A,D,F
855	R.Lancashire	B	1.50	D	1548	R.Bristol	B	5.00	C
855	R.Norfolk, Postwick	B	1.50	D	1548	Capital G, London	I	97.50	C,D,X*
855	Sunshine 855,Ludlow	I	0.15	A,D,F	1557	R.Lancashire	B	0.25	D*
873	R.Norfolk, W.Lynn	B	0.30	C,D,F	1557	CI.Gold 1557,N.hant	I	0.76	D*,F
936	Brunel CG, W.Wilts	I	0.18	C,D,F	1557	Capital G, So'ton	I	0.50	C
945	CI.Gold GEM, Derby	I	0.20	D,F	1566	CountySnd,Guildford	I	0.50	A*,C,X*
945	Capital G, Bexhill	I	0.75	C,D	1584	London Turkish R	I	0.20	B,D
954	CI.Gold 954 via ?	I	?	D	1584	R.Nottingham	B	1.00	B*,D,F
954	CI.Gold 954,Torquay	I	0.32	C	1602	R.Kent	B	0.25	C,D,F
954	CI.Gold 954, H'ford	I	0.16	A,F					
963	Asian Sd, E.Lancs	I	0.80	D					
963	Liberty R, Hackney	I	1.00	C,D,FX*					
972	Liberty R, Southall	I	1.00	A,C,D,FX*					
990	R.Devon, E.Devon	B	1.00	A,C					
990	Magic AM,Doncaster	I	0.25	D					
990	CI.G, Wolverhampton	I	0.09	D,F					
999	C.Gold GEM Nott'ham	I	0.25	D,F					
999	R.Solent	B	1.00	B,C					
999	Valley R, Aberdare	I	0.300	A					
1017	CI.G,WABC,Shr'shire	I	0.70	D*,F					
1026	R.Cambridgeshire	B	0.50	D,F					
1026	R.Jersey	B	1.00	C					
1035	RTL C'try(Ritz)1035	I	1.00	C,D,FX*					
1035	R.Sheffield	B	1.00	D					
1116	R.Derby	B	1.20	D,F					
1116	R.Guernsey	B	0.50	C					
1116	Valley R, Ebbw Vale	I	0.50	A,D*					
1152	CI.G Amber, Norwich	I	0.83	D					
1152	LBC 1152 AM	I	23.50	C,D,F					
1152	CI.G, Birmingham	I	3.00	F					
1161	R.Bedfordshire(3CR)	B	0.10	D,F					
1161	Southern Counties R	B	1.00	C					
1170	CI.G Amber, Ipswich	I	0.28	D					
1170	Capital G,Portsmouth	I	0.25	B,C					
1170	1170AM,High Wycombe	I	0.50	D,F					
1242	Capital G,Maldstone	I	0.32	A*,C					
1251	C.G Amber,Bury StEd	I	0.76	D					
1260	Brunel CG, Bristol	I	1.60	C					
1260	SabrasSnd,Leicester	I	0.29	D,F					
1278	CI.Gold 1278 W.York	I	0.43	D					
1296	Radio XL,Birmingham	I	5.00	C,D,F					
1305	Premier via ?	I	0.50	C,D,FX*					
1305	Touch AM, Newport	I	0.20	C					
1323	Capital G, Southwick	I	0.50	B,C,D					
1323	SomersetSnd,Bristol	B	0.63	A,D*					
1332	Premier, Battersea	I	1.00	C,X*					

9.790 (Eng to Asia, Far East, Pacific 0930-1130) 44243 at 0931 in Newry; R.Vilnius, Lithuania **9.710** (Eng to Eur 0930-1000) 55544 at 0945 in Herstmonceux; R.Mediterranee Int, Morocco **9.575** (Ar, Fr to N.Africa, S.Eur 0500-0100) 44434 at 1005 in Oxted; R.Nederlands via Wertachtal, Germany **9.860** (Eng to Eur 1030-1225) 55555 at 1145 in Herstmonceux.

Later, VOA via Tinang, Philippines **9.760** (Eng to Asia, Australia 1600-1700) was 44434 at 1633 in Woodhall Spa; R.Nederlands via Flevo **9.895** (Eng to Africa 1830-2025) was rated SIO 333 at 2003 by Francis Hearne in N.Bristol; Voice of Russia **9.480** (Eng 7-2100) 54445 at 2015 in Stalbridge; R.Vlaanderen, Belgium **9.925** (Ger, Fr, Eng, Dut to Eur 1800-2100) 55555 at 2030 in Appleby; R.Cairo, Egypt **9.990** (Eng to Eur 2115-2145) 44444 at 2130 in Morden; BBC via Cyprus **9.410** (Eng to W/SW.Eur, N.Africa 1600-2200) 33333 at 2135 in Truro; WTJC Newport NC, USA **9.370** (Eng to N.America 24hrs) 45444 at 2230 in Northampton; Swiss R.Int via Sottens **9.885** (Fr, Ger, It, Eng to S.America 2200-0000) 44522 at 2340 in E.Bristol.

Some of the broadcasts in the **7MHz (41m)** band are beamed towards Europe. Those noted in the reports came from WYFR Family R. via Okeechobee FL, USA **7.355** (Eng 0600-0800), rated 33333 at 0705 in Morden; R.Slovakia Int. **7.345** (Eng 1630-1700) 44444 at 1635 in Woodhall Spa; AIR via Bangalore **7.410** (Eng, Hind 1745-2230) 33333 at 1815 in Colyton & 45544 at 2045 in Northampton; Voice of Russia **7.440** (Eng - News 1930) 44444 at 1930 in Storrington; Deutsche Welle via Nauen, Germany **7.185** (Ger) 54445 at 2125 in Stalbridge.

Some intended for listeners in other areas were also logged by listeners in the UK: WBCQ Monticello, USA **7.415** (Eng to N.America 2100-1100), rated 43343 at 0632 in Morpeth; World Harvest Radio (WHRI) via Maine, USA **7.315** (Eng to N.America 0000-1000) 43333 at 0730 in Herstmonceux; KTBN via Salt Lake City, USA **7.510** (Eng to N.America 0000-1600) 34332 at 0951 in Oxted; R.Nederlands via Madagascar **7.120** (Eng to Africa 1730-2025) 44444 at 1730 in Newry.

Most of the broadcasts in the **6MHz (49m)** band are intended for European listeners. Some come from Deutschland R, Berlin **6.005** (Ger 24hrs), rated 44434 at 0751 in Oxted; R.Nederlands via Julich, Germany **6.045** (Eng 1030-1225) 55544 at 1150 in Herstmonceux; R.Slovakia Int. **6.055** (Eng 1630-1700) 44444 at 1633 in Woodhall Spa; R.Austria Int, via Moosbrunn **6.155** (Various) SIO 444 at 1931 in N.Bristol; R.Canada Int via Sweden? **5.850** (Eng/Fr) 55445 at 2030 in Stalbridge; BBC via Rampisham, UK **6.195** (Eng 1700-0000) 44444 at 2045 in Truro; Bayerischer Rundfunk, Germany **6.085** (Ger 24hrs) 44444 at 2100 in Colyton.

Late at night, some intended for other areas may reach the UK. Mentioned in the reports were the BBC via Antigua, W.Indies **5.975** (Eng to Caribbean, C/S.America 2100-0600), rated 45433 at 2335 in N.Bristol; R.Nederlands via Bonaire, Ned.Antilles **6.165** (Eng to N.America 2330-0125) 42443 at 2335 in Newry; American Forces Network (AFN) via Puerto Rico **6.458** (Eng [u.s.b.]) 44444 at 0027 in Morpeth.

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

Listeners:-

- (A) Simon Hockenhill, E.Bristol.
- (B) Sheila Hughes, Morden.
- (C) Eddie McKeown, Newry.
- (D) George Millmore, Wootton IoW.
- (E) Clare Pinder, while in Appleby.
- (F) Vic Prier, Colyton.
- (G) Harry Richards, Barton-on-Humber.
- (H) Ernie Strong, Ramsey, Cambs.
- (I) Michael Wasley, Bergen, Norway.
- (J) Michael Wasley, Nr.Kirkenes, N.Norway.
- (K) Michael Wasley, between Stavanger & Haugesund, Norway.
- (L) Michael Wasley, Nr.Trondheim, Norway.
- (M) Fred Wilmschurst, Northampton.
- (X) Philip Miller Tate, Walton-on-Thames.

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener
792	Sevilla(SER)	Spain	20	C*,D*	1125	Llandrindod Wells	UK	1	C*,H
801	Munche-Ismaning	Germany	300	C*,D*,H*	1134	Zadar(Croatian R)	Croatia	600/1200	A*,C*,D*,M*,X*
801	Ajlun	Jordan	2000	H*	1134	COPE via ?	Spain	2	C*,D*,H*
801	RNE1 via ?	Spain	?	D*,H*,X*	1143	Stuttgart(AFN)	Germany	10	A*,C*
810	Madrid(SER)	Spain	20	D*,H*,X*	1143	Bolshakov(Mayak)	Russia	150	H*
810	Burghhead(BBCScot)	UK	100	L,K,L	1143	COPE via ?	Spain	2	C*,H
810	Westertlen(BBCScot)UK	UK	100	A*,C*,H,M*,X*	1179	SER via ?	Spain	?	H
819	Batra	Egypt	450	C*,D*,H*	1179	Solvestorg	Sweden	600	A*,C*,D*,L,M*,X*
819	S.Sebastian(El)	Spain	5	C*,D*	1188	Kuume	Belgium	5	C*,D*
828	Hannover(NDR)	Germany	100/5	C*	1188	Reichenbach(MDR)	Germany	5	H
828	Heineoord(CI.Rock)	Holland	20	A*,H	1188	Marcali(VOA/RFE)	Hungary	500	A*,C*,M*
837	Nancy	France	200	A*,C*,D*,X*	1197	Munich(VOA)	Germany	300	A*,C*,E*,G,K,M*
837	Amchit	Lebanon	100	H*	1197	Virgin via ?	UK	?	C,D,H,M,X*
837	COPE via ?	Spain	?	C*,D*	1206	Bordeaux	France	100	A*,C*,D*,H,M*,X*
846	Rome	Italy	1200	C*	1215	Kaliningrad	Russia	500	K
855	RNE1 via ?	Spain	?	C*,D*,H,M*,X*	1215	Virgin via ?	UK	?	C,D,H,L,M,X*
864	Santah	Egypt	500	D*	1224	Vidin	Bulgaria	500	C*
864	Paris	France	300	C*,D*,H,M*,X*	1224	Lelystad	Holland	50	C*,D*,H
864	Socuellamos(RNE1)	Spain	2	H*	1224	COPE via ?	Spain	?	H
873	Zaragoza(AFN)	Germany	150	C*,D*,M*	1233	Nitra	Slovakia	40	C*
873	Frankfurt(SER)	Spain	20	C*,D*	1233	Virgin via ?	UK	?	C*,H
873	Enniskillen(R.UJ)	UK	1	C	1242	Marseille	France	150	C*
882	Barcelona	Spain	20	A*	1242	Virgin via ?	UK	?	C*,H,M
882	COPE via ?	Spain	?	C*	1251	Huisberg	Netherlands	10	C*,D*,H
882	Washford(BBCWales)UK	UK	100	C,D,H,L,M	1260	COPE via ?	Spain	?	C*,D*,H*
891	Algiers	Algeria	600/300	D*,H*,X*	1260	Guliford(V)	UK	0.5	C*
891	Hulsberg	Netherlands	20	C*	1269	Neumunster(DLF)	Germany	600	C*,H,K,M*,X*
900	Bmo(CRo2)	Czech Rep	25	C*,D*,H*	1269	COPE via ?	Spain	?	C*,H
900	Milan	Italy	600	C*,D*,H*,X*	1278	Dublin(Cork)(RTE2)	Eire	10	C,H,M*
900	COPE via ?	Spain	?	H	1278	Strasbourg	France	300	A*
909	B'mans Pk(BBC5)	UK	140	D,H,L,M,X*	1278	Kermanshah	Iran	200	H*
918	Domzale	Slovenia	600/100	C*,D*,H*,M*	1287	RFE via ?	Czech Rep.	?	C*,H*
918	Madrid(R.Int)	Spain	20	C*	1287	Lerida(SER)	Spain	10	C*,H*,M*
927	Volventem	Belgium	300	C*,D*,H,M	1296	Vitala(COPE)	Spain	10	D*,H,M*
927	Nitra	Slovakia	50	C*	1296	Drfordness(BBC)	UK	500	C*,H
936	Bremen	Germany	100	C*	1305	RNE5 via ?	Spain	?	C*,M*
936	Venezia	Italy	20	D*	1314	Kvitsov	Norway	1200	A*,C,D,H,K,L,M*,X*
945	Toulouse	France	300	A*,C*,D*,H*,X*	1323	W'brunn (VOR)	Germany	800/150	C,H,M,X*
945	Bmo (C/Ro2)	Czech Rep	200	C*,D*,H*	1332	Rome	Italy	300	C*,D*,H*
954	Madrid(CI)	Spain	20	C*,D*,H*,M*	1341	Lisnagarvey(BBC)	N.Ireland	100	A*,D*,H*,M*,X*
963	Pori	Finland	600	A*,C*,D*,H*,K	1359	Madrid(RNE-FS)	Spain	600	C*,D*,M*,X*
972	Hamburg(NDR)	Germany	100	C*,H	1368	Foxdale(Manx R)	Is of Man	20	C*,D*,H*
972	RNE1 via ?	Spain	?	C*,H*	1377	Lille	France	300	A*,C*,D*,H,M*,X*
972	Chernobyl	Ukraine	500	H*	1386	Bolshakov	Russia	2500	B*,C*,M*
981	Alger	Algeria	600/300	D*,H	1395	Filake	Albania	1000	H*
981	Megara	Greece	200	H*	1395	TWR via Filake	Albania	500	C*
990	Berlin	Germany	100	C*,H*,K,X*	1395	Lopic	Netherlands	120/40	C*,D*,H,K,L,M
990	R.Bilbao(SER)	Spain	10	C*,H	1404	Brest	France	20	C*,D*,H,M*
999	Schwerin (RIAS)	Germany	20	C*	1413	RNE5 via ?	Spain	?	A*,C*
999	Madrid(COPE)	Spain	50	C*,M*,X*	1422	Heusweiler(DLF)	Germany	1200/600	C*,D*,H,M*
1008	SER via ?	Canaries/Spain	?	C*,H*	1440	Mamach(RTL)	Luxembourg	1200	B*,C,D,H,M,M*,X*
1008	Flevo(NDS-5)	Holland	400	C*,D*,H,K,M,X*	1440	Damman	Saudi Arabia	1600	C*
1017	Rheinsender(SWF)	Germany	600	A*,C*,D*,H,M*,X*	1449	Squinzano (RAI)	Italy	50	C*,D*
1017	RNE5 via ?	Spain	?	C*,H*	1449	Redmoss(BBC)	UK	2	C*,K
1026	SER via ?	Spain	?	D*	1458	Filake	Albania	500	D*
1035	Milan	Italy	50	H*	1467	Monte Carlo(TWR)	Monaco	1000/400	C*,D*,H,M*
1035	Lisbon	Portugal	120	C*	1476	Wien-Bisamberg	Austria	600	C*,D*,H*,M*
1044	Dresden(MDR)	Germany	20	C*,D*	1485	SER via ?	Spain	?	B*,D*
1044	Sebaa-Aioun	Morocco	300	H	1494	Clermont-Ferrand	France	20	A*,C*,H,M*
1044	S.Sebastian(SER)	Spain	10	C*,H	1494	Krasnyy Bor	Russia	1200	C*,D*
1053	Iasi	Romania	1000	A*	1503	Bashehr	Iran	50	C*
1053	Zaragoza(COPE)	Spain	10	C*	1503	RNE5 via ?	Spain	?	B*,H*
1053	Talk Sport via ?	UK	?	C*,D*,H,M*,X*	1512	Volventem	Belgium	300	C*,D*,E*,H,M*,X*
1062	Kalundborg	Denmark	250	A*,C*,D*,H,K,M*	1512	Jeddah	Saudi Arabia	1000	C*
1062	R.Uno via ?	Italy	?	C*	1512	R.Mayak via ?	Russia	?	J
1071	Riga	Latvia	50	D*	1521	Kosice(Cizaitice)	Slovakia	600	C*,D*,M*
1071	Bilbao(El)	Spain	5	C*,H	1521	Castellon (SER)	Spain	?	A*
1071	Talk Sport via ?	UK	?	C*,H,M	1530	Vatican R	Italy	150/450	A*,C*,D*,M*
1080	SER via ?	Spain	?	C*,D*,H	1539	Mainfingen(ERF)	Germany	350/700	A*,C*,D*,H,K,M*
1089	Talk Sport via ?	UK	?	C*,D*,H,K,M,X*	1539	SER via ?	Spain	?	H
1098	Nitra(Jarok)	Slovakia	1500	A*,C*,D*,H,M*	1557	Nice	France	300	A*
1098	RNE5 via ?	Spain	?	C*	1575	Genova	Italy	50	C*,M*
1107	AFN via ?	Germany	10	C*	1575	SER via ?	Spain	5	C*,D*,H*,X*
1107	RNE5 via ?	Spain	?	C*	1593	Marrakech	Morocco	1	C*
1107	Talk Sport via ?	UK	?	C*,D,H,M	1602	SER via ?	Spain	?	C*
1116	Pontevedra(SER)	Spain	5	C*	1602	Vitoria(El)	Spain	10	C*,D*,M*,X*
1125	La Louviere	Belgium	20	C*,H*,M*	1611	Vatican R	Italy	15	A*
1125	Deanovec	Croatia	100	A*,M*					
1125	El Beida	Libya	500	H*					
1125	RNE5 via ?	Spain	?	H					

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Bandscan Australia

As I write this I am preparing for six days by myself walking the Alpine Walking Track through some of the high country straddling the New South Wales - Victoria border. Mobile telephone coverage doesn't exist in these wilderness areas, but I most certainly will have my EPIRB and GPS ready for emergencies. This time I have news of pay television in Australia, the National Transmission Network, sports and the Australian Broadcasting Corporation.

Pay TV

Following years of making losses, Australia's major pay television players are proposing a deal that has far-reaching consequences. The biggest player, Foxtel, has just under 800,000 subscribers and an annual loss looking like \$A100 million (about £37 million). It is locked into long-term contracts for the supply of films from Hollywood that have become more costly since the collapse of the Australian dollar against the greenback. It has supplied its content via cable infrastructure provided by Australia's major telecommunications company Telstra. Telstra is half owner of Foxtel so that makes pretty good sense.

Optus, the other main pay TV player and telecommunications carrier in its own right has been making losses on its 200,000 or more pay TV customers, even though it is able to bundle telephone and Internet services.

The deal between these two has Foxtel becoming the only provider of content to its own and Optus customers. This means Optus can exit its loss-making pay TV business and concentrate on telephony and the Internet while providing enhanced content to its current pay TV customers. Foxtel and Telstra are also planning to bundle pay TV, telephony and Internet.

It's all pretty cosy, but some of the other players think it's just too cosy having basically one pay TV provider. The Australian Competition and Consumer Commission is studying the implications for consumer prices and the future of competition in this market, but has yet to decide whether it will permit the marriage to proceed.

Other players, like some of the small regional pay TV providers are concerned about their future access too as are other content providers like Australian commercial television network Network Seven and newspaper conglomerate John Fairfax.

Radio Australia

For those who aren't regular readers, here are the latest Radio Australia (RA) frequencies: 5.995, 6.020, 6.080, 7.240, 9.475, 9.500, 9.580, 9.660, 9.710, 9.815, 11.650, 11.660, 11.695, 11.880, 12.080, 13.605, 13.620, 15.240, 15.415, 15.515, 17.580, 17.715, 17.750, 17.775, 17.795, 21.725, 21.740 and 21.820MHz. The Internet equipped can get program guides and a whole lot more from <http://www.abc.net.au/ra>

Transmitters

As part of the privatisation of government assets, the National Transmission Network (NTN) was sold in April 1999 to NTL Incorporated. Now, following Federal government approval, NTN has been on sold to the Australian merchant banker Macquarie Bank. Macquarie Bank has assured all parties that there will be no interruption to services. The sale was completed on 2nd April this year, just a few weeks shy of three years since the original sale.

The NTN is the owner and operator of transmission facilities - including antennas and transmitters - used by among others the Australian Broadcasting Corporation (ABC) and the Special Broadcasting Service (SBS). The continued operation of these services relies vitally on NTN services. Macquarie Bank has been expanding its operations and has become more frequently mentioned of recent months in the context of investment in a range of infrastructure projects.

Sport

'Bandscan Australia' readers may remember that Australia has what is termed an anti-siphoning list. This list of sports and sports fixtures was set up on the inception of pay television in this country to make sure that popular matches remained generally available on free-to-air television. The concern then was that pay television operators would buy the rights thereby forcing a sports mad population to subscribe. The whole anti-siphoning world is in some turmoil however. With 37 sports on the list, a large percentage is still not shown live and another large percentage is not shown at all.

The affair came to a head over one free to air network proposing to move popular Australian Football League (AFL) fixtures very late at night, or stitching up a deal to have them run at reasonable times in some areas on pay television. AFL fans have not been impressed and the government has been forced to look again at the list and the way in which it operates. The responsible minister has been quoted as saying that the government is not a television programmer. With big commercial interests ranged on one side and angry fans on the other, it is anybody's guess which way the government will decide to jump.

ABC MD

The ABC is moving slowly in its process to replace Jonathan Shier as managing director. Readers will remember that Shier resigned recently after a very controversial nineteen months in the role. The task of selecting a short list has been given to the firm of headhunters Rochford International.

The current chair of the board of the ABC, Donald McDonald, has denied he is interested as have a number of current senior ABC employees. Three London-based expatriates have been mentioned as possibilities for the task. These are John O'Loan, head of the National Geographic Channel in Europe and creator of Europe's first 24-hour news channel SkyNews; Jim Rudder, head of BSkyB's interactive digital services and Bronwyn Curtis, managing editor of Bloomberg Television. The board is reported to be keen to find someone with a less controversial style than Mr Shier. It is also reported that there will be great difficulty in attracting someone from the high salary levels in the UK to the relatively modest salaries on offer at the ABC. Still, Mr Shier did get a \$A1 million (about £370,000) golden handshake.



Reports

Martyn Gardiner from Portsmouth has been tuning his loom again and has been receiving RA quite clearly on 15.240MHz on Saturday mornings from 0830-0900 and Sunday mornings at the same time. Interestingly, Martyn found that 15.415MHz was a better choice for Sunday.

Other News

Digital television. In the fifteen months since digital television started in Australia, only 12,500 digital set-top boxes have been sold according to the Federation of Australian Television Stations (FACTS). In 6.8 million homes that makes a mighty small percentage which can access the new signals. In the light of the demise of UK's ITV Digital even with a much larger viewer base, commentators here are wondering about the viability of digital in the medium term.

I welcome any news and comments. In particular I am interested in any s.w.i. information on Australian stations heard by SWM readers so I can chase up more details and interesting snippets from this end. My address is **PO Box 3307, Manuka, ACT 2603, Australia**. For personal replies please send two IRCs. Those with an Internet connection can get me at ggreg@pcug.org.au or gregmbaker@hotmail.com

SSB *utilities* Special

Monitoring the German Air Force

The German Air Force (GAF) is easily heard from the UK and much of Europe - Graham Tanner gives an insight into what you might hear, where the signals are coming from, callsign information and much more.

Listen in...

I am often asked by readers to suggest new and different h.f. frequencies to listen to and the h.f. network operated by the German Air Force (GAF) is usually my preferred recommendation. It is sufficiently busy to be able to hold ones attention for several hours at a time, it is easy to hear from the UK and much of the rest of Europe, and almost all the traffic is passed in English language.

Therefore I decided to compile this feature using information from several different sources with the intention of explaining what you might hear, where the signals are coming from, information about the callsigns, and a partial list of selcall codes for the aircraft usually heard using the network. Once you start listening to the GAF network, most of what follows will be useful in one way or another.

Following the reunification of Germany at the end of 1990, the German military has undergone a period of reorganisation, with new aircraft

arriving, old aircraft being retired or sold, airfields closing and military units moving from one part of the country to another.

When the two military forces were combined, almost all of the former East German aircraft and helicopters were declared obsolete and very few types stayed on until the mid 1990s.

By the start of the century, only one Fighter Wing equipped with the Mikoyan MiG-29 and a small fleet of Ilyushin IL-62 and Tupolev Tu-154 transport aircraft remained. The military forces of Germany are known as the 'Federal Republic Armed Forces' (Bundeswehr) and comprises the Luftwaffe (Air Force), the Marineflieger (Navy) and Heeresflieger (Army). The military service of the former East Germany was the Nationale Volksarmee (NVA), which ceased to exist from 3rd October 1990.

German Air Force

The German Air Force maintains its own dedicated h.f. network with stations around Germany and also at overseas bases where the Germans have a presence on



German Air Force airfields.

UN duties. The primary user of the GAF h.f. network is either the large fleet of C.160D Transall transport aircraft, or the varied

fleet of VIP and passenger transport aircraft, although I have personally heard German Navy aircraft and even an

occasional German Army helicopter.

With many years of listening to the GAF h.f. network, it is fair to say that most of the traffic is simply departure and

arrival messages, selcall checks, and radio-checks between the various ground stations. I have never heard any 'phone-patches or tactical information being passed on h.f., but stations have been heard discussing frequencies 'AA', 'AC', 'AE' and 'AJ' which carry encrypted RTTY transmissions. Most of the voice signals can be heard clearly in the UK throughout the day, with the majority of the radio traffic occurring during the week.

The main GAF station is the LeitungFunkStaffel /LTKdo which operates around the clock using the callsign 'DHM91' (and often abbreviated to 'M91' or just '91') and is based at Munster in northern Germany. This station keeps a check on all transport flights within Germany or by GAF aircraft overseas. The GAF operates three separate squadrons of C.160D Transall transport aircraft based in southern, central and northern Germany, they also have a mixed fleet of VIP and passenger transport aircraft based at Koln-Bonn, with a

detachment in Berlin.

There are three squadrons of C.160D Transall aircraft stationed at three different Air Bases in Germany and at each Air Base there is a h.f. radio station which forms part of the GAF network. Near Munich in southern Germany can be found Landsberg AB, home LTG-61 (Luft Transport Geschwader 61 - 61st Air Transport Wing) and their callsign is 'DHO23'. Wunstorf AB can be found west of Hannover and it is the home of LTG-62 using callsign 'DHO32'. Finally, north of

Table 1: Frequencies used by GAF.

MHz	Designator
3.107	Alpha
3.143	Bravo
3.903	Charlie
4.721	Delta
5.687	Echo (primary net frequency)
5.717	Foxtrot
6.700	Golf
6.715	Hotel
6.730	India
6.751	Juliet
8.965	Kilo
9.025	Lima
11.217	Mike
11.265	November
13.203	Oscar
13.233	Papa
15.073	Quebec
17.973	Romeo
17.991	Sierra
18.012	Tango
23.201	Uniform
23.215	Victor
23.255	Whisky
23.318	X-ray
23.341	Yankee
23.345	Zulu
29.724	Alpha-Bravo

Frequency 'Echo' is the main calling frequency within the network and it is here that most of the traffic will be heard. This frequency is operational 24 hours a day, but not all the ground stations are active for the entire time period. There are suggestions that frequency 'Victor' may be 23.231, but this has not been confirmed, as signals are very rarely reported on the higher frequencies.

Hamburg in northern Germany lies Hohn AB, home of LTG-63 with the callsign 'DHO60'. Just about any time that a C.160D flies from any of these bases to anywhere else, they will check in with DHM91 to report the departure time, their destination and ETA. Listening for an entire day it is possible to hear a flight depart from one base, visit several other Bases during the day, and finally return home at the end of the day. The C.160D Transall is a medium sized transport aircraft developed during the 1960s in a collaboration between France and Germany. The aircraft is a high-winged twin-engined aircraft with a loading ramp at the rear to allow cargo and troops to be quickly loaded and off-loaded.

The VIP and passenger transport fleet is based at Koln-Bonn airport and comprises six Canadair CL.601 Challenger aircraft and seven Airbus A.310 aircraft acquired from the national airline Lufthansa and the former East German airline Interflug. The operating unit is the 'Flugbereitschaft BMVg'. One of the Challenger aircraft is usually reserved for use by the German Chancellor and this usually uses a fixed callsign of 'GAF 001' - the German equivalent of 'Air Force 1'. When the Chancellor flies further afield he uses one of the Airbus aircraft, usually with the same callsign.

Three of the Airbus aircraft are fitted for passenger transport, including one with a VIP interior, while the other four aircraft are known as 'MRTT' - Multi-Role, Tanker, Transport aircraft, they are able to transport mixed loads of freight and passengers, or they can be used to refuel combat aircraft via wing-tip refuelling pods.

The callsign system used by GAF transport

Table 2: German Airfield Designators.

EDDB	Berlin-Schonefeld
EDDF	Frankfurt/Rhein-Main
EDDH	Hamburg
EDDK	Koeln-Bonn
EDDL	Dusseldorf
EDDM	Munich
EDDS	Stuttgart
EDDV	Hannover
ETHB	Bückerburg
ETHC	Celle
ETHE	Bentlage
ETHF	Fritzlar
ETHI	Itzehoe
ETHL	Laupheim
ETHM	Mendig
ETHN	Niederstetten
ETHR	Roth
ETHS	Fassberg
ETHT	Cottbus
ETME	Eggebek
ETMK	Kiel
ETMN	Nordholz
ETNB	Berlin-Tegel
ETND	Diepholz
ETNG	Geilenkirchen
ETNH	Hohn
ETNJ	Jever
ETNL	Laage
ETNN	Norvenich
ETNP	Hopsten
ETNS	Schleswig-Jagel
ETNT	Wittmundhafen
ETNU	Neubrandenburg
ETNW	Wunstorf
ETSA	Landsberg
ETSB	Buchel
ETSE	Erding
ETSF	Furstenfeldbruck
ETSH	Holzdorf
ETSI	Manching-Ingoldstadt
ETSL	Lechfeld
ETSM	Memmingen
ETSN	Neuberg
DHJ41	location unknown, possibly in Italy
DHM42	Glucksburg RCC/SAR
DHM81	callsigns used for world-wide GAF activities (see below)
DHM91	GAF transport HQ, Munster
DHO23	LTG-61, Landsberg AB
DHO24	German Navy Nordholz, Germany
DHO32	LTG-62, Wunstorf AB
DHO37	Sabiha Gokcen Intl Airport, Istanbul, Turkey (see below)
DHO60	LTG-63, Hohn AB
DHO75	collective call for all three LTGs
OSIP	Vicenza AB, Italy
NI81	Piacenza AB, Italy

aircraft is very simple - just a three-digit number prefixed by 'GAF'. The numbers are not allocated in ranges and there does not seem to be any attempt to allocate and use them in sequence. One other callsign sequence used by the GAF is for UN missions, currently the prefix for German aircraft on these flights is 'JGE' and these are regularly heard on their h.f. network. You may also hear a 'JGZ' prefix callsign, and this is thought to be a GAF aircraft operating on a UN flight. Occasionally the aircraft do use tactical callsigns, for example, the callsign 'TAC 12' was used by a C.160D Transall during March 2002. They have also been known to use the prefix 'Mission' followed by a four-digit number.

The Airbus aircraft can often be heard flying across the Atlantic, operating to and from the USA. Apart from the standard diplomatic flights, these Airbus

flights are usually operating to Canada supporting aircraft and troops on exercise, or to the GAF training detachment at Holloman AFB in New Mexico

ICAO Designators

When monitoring the GAF h.f. network you will find that most flights identify their departure and destination airfields by using the 4-letter ICAO designators. **Table 2** details the designators for the German military airfields, along with those of the major civil airfields within Germany.

DHM81 - the DHM81 callsign is used for world-wide GAF-activities under UN/NATO-command. Mobile unit of LTG, they call it "Kabine" (cabin/container). It's a standard ISO container equipped with a complete h.f. radio station and several whip and wire antennas. During the late 1990s it was used in Sudan, and the "Kabine" was

Table 3

Time (UTC)	Stations	Remarks, comments
0659	DHM91/NI81	radio check
	NI81/DHM91	please check frequency AE for F1
0707	JGE99/DHM91	departed 0704, estimate Landsberg 0822
0712	GAF801/DHM91	departed Landsberg 0710, estimate Wunstorf 0930
0726	GAF320/DHM91	landed Cologne 0725
0751	GAF043/DHM91	request selcall check on BM-QS
0753	GAF843/DHM91	request selcall check on GH-CP
0822	JGE99/DHM91	arrived Landsberg 0822
0859	GAF320/DHM91	departed Cologne 0820, estimate Landsberg 0930
0954	DHO23	calling JGE99, no response
0958	GAF320/DHO23	arrived Landsberg 1000
1002	GAF043/DHM91	departed Cologne 0920, estimate Goose Bay (Canada) 1510, 184 passengers; told to use frequencies 'M' and 'S'
1035	DHM91/DHO75	'91 calls for all three stations to give a radio-check; responses from DHO23, DHO32 and then DHO60
1121	GAF801/DHM91	departed Wunstorf 1115, estimate Landsberg 1400
1124	GAF320/NI81	load message passed in German language
1128	GAF523/DHM91	arrived Hopsten 1125
1154	GAF244/DHM91	arrived Hopsten 1145
1213	GN4736/DHM91	radio check, request weather at Nordholz 1315
1227	GAF523/DHM91	departed Hopsten 1225 estimate Landsberg 1400
1234	GN4736/DHM91	radio check, position 50° 55N 009° 25E
1254	GAF244/DHM91	departed Hopsten 1245, estimate Landsberg 1420

continued on page 22

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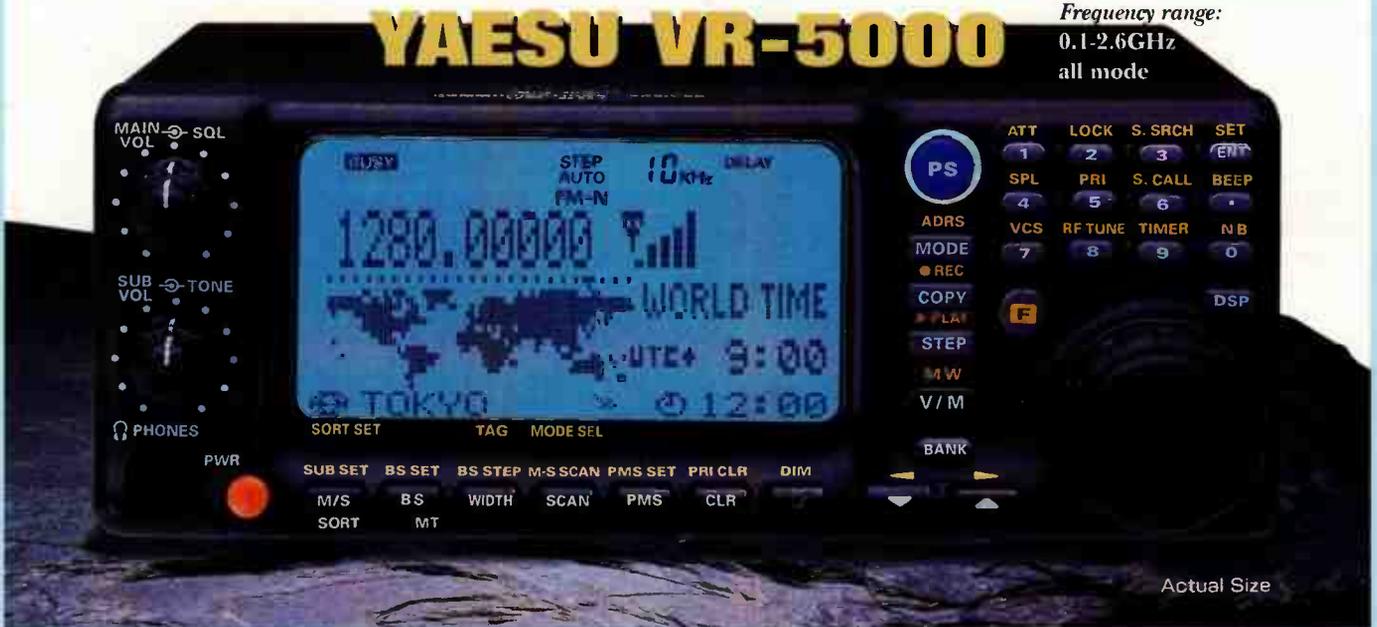


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Comments from John Griffiths

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This new short wave listeners antenna was initially made specifically for one of our commercial customers but we felt the general public would find it of great interest. At only just over 7 feet high this vertical short wave receiving antenna will give amazing results from 0.2-30MHz and thanks to its commercial construction you simply erect it and away you go. Length 7'6". Fitting PL-259 (not supplied).

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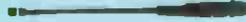
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CC-8200 PC interface£79.99

NEW ALINCO X-2000



The intelligent scanner! 100kHz-2.15GHz. All mode incl's SSB, "Flash Tune" reads frequency of nearby signal & tunes the handle for you. Incl's battery, charger & loads more.

A SNIP @ **£449.95**

Optional case£15.00

DJ-X10Sale price £249.00

MVT-7100EU



Wideband hand-held scanner covers 500kHz-1650MHz. (All mode). Includes nicad/car charger/charger/antenna. Extremely user-friendly hand-held receiver with outstanding performance unmatched by its rivals.

OUR PRICE **£199.95**

Soft case for 7100EU/9000 - specify £19.99

MVT-9000 MkIIsale price £325.00

MICRO MAG ANTENNA

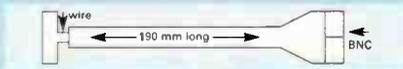
MM-1

Micro magnetic base with (19") whip. Rx- 0.5MHz-2GHz. Ideal for all scanners supplied with miniature coax lead & BNC (all fitted).

OUR PRICE **£24.95** P&P £5.00

WIRE INTERFACE

Q-TEK H.F.I.



(0-30MHz)

A compact "BNC" interface for hand-held scanners - allows long wires to be connected to hand-helds whilst aiding in reducing some noise patterns.

OUR PRICE **£19.95** P&P £2.00

Q-TEK PL-25

0.2-2GHz.

An easy to use PL-259 (right angled) telescopic whip. Ideal for all receivers.

OUR PRICE **£19.95**
P&P £2.50

BNC adaptor£3.49

SECONDHAND LIST

NRD-545 DSP as new.....	£999.00	AR-8200 MkI vgc.....	£249.00
VR-5000 as new.....	£499.95	AR-8200 MkII as new.....	£299.95
PRO-63 66-512MHz.....	£69.95	WA-1000 (Welz) as new.....	£139.95
DX-394 as new.....	£99.95	SW-7600 all mode S/W.....	£89.95
VR-500 as new.....	£179.95	SW-7600 (GR) as new.....	£135.00
RD-500VX as new.....	£499.95	GPS III+ as new.....	£225.00
MVT-9000 as new.....	£249.95	Icom R-3 as new.....	£349.95
MVT-9000 MkII as new.....	£289.95	Yaesu VR-120 as new.....	£99.95
MVT-7100 as new.....	£169.95	NRD-345 as new.....	£399.95
MVT-7300 as new.....	£199.95	ICR75 as new (incl's DSP).....	£529.95

WATSON HUNTER



Frequency counter covers 10MHz-3GHz. Incl's nicad, charger, antenna.

ONLY **£59.95**

P&P £6.00

Optional case £14.99£7.50

OPTO DIGITAL SCOUT



60MHz-2.6GHz alphanumeric LCD + light + vibration alarm. Will detect different types of digital modulations such as: TDMA, GSM, APCO25, Tetra, plus more. 1000 memories plus reaction tune facility. Compact size.

NOW AVAILABLE **£499.95**

Opto CD100 half price£199.95

Table 4:

Selcall	A/C Identifier (Tail No.)	A/C Type
BM-PS	1021	A.310 Airbus
BM-QR	1022	A.310 Airbus
BM-QS	1023	A.310 Airbus
PS-AH	1024	A.310 Airbus
PS-AJ	1025	A.310 Airbus
HM-JK	1026	A.310 Airbus
FK-AE	1027	A.310 Airbus
GH-CP	1120	Ilyushin IL-62
EQ-HJ	1121	Ilyushin IL-62
GH-BC	1122	Ilyushin IL-62
CK-HP	1123	Ilyushin IL-62
CJ-FK	1201	CL.601 Challenger (sold 12/01)
CJ-FL	1202	CL.601 Challenger
CJ-FM	1203	CL.601 Challenger
CJ-GL	1204	CL.601 Challenger
CJ-GM	1205	CL.601 Challenger
GJ-HL	1206	CL.601 Challenger
GJ-KL	1207	CL.601 Challenger
GH-CP	5008	C.160D Transall
GH-DP	5007	C.160D Transall
GH-JP	5029	C.160D Transall
GH-LP	5034	C.160D Transall
GH-MP	5035	C.160D Transall
GJ-CP	5038	C.160D Transall
GJ-LP	5044	C.160D Transall
GK-BP	5047	C.160D Transall
GK-JP	5053	C.160D Transall
GK-LP	5054	C.160D Transall
GK-MP	5055	C.160D Transall
GM-CP	5069	C.160D Transall
GP-AD	5073	C.160D Transall
GM-KP	5075	C.160D Transall
GH-AP	5076	C.160D Transall
GP-AF	5081	C.160D Transall
GP-AM	5083	C.160D Transall
GP-AL	5085	C.160D Transall
GP-AM	5086	C.160D Transall
GP-BC	5087	C.160D Transall
GP-BF	5090	C.160D Transall
GP-BH	5091	C.160D Transall
GP-BJ	5092	C.160D Transall
GP-BK	5093	C.160D Transall
GP-BL	5094	C.160D Transall
GP-BM	5095	C.160D Transall
GP-CD	5096	C.160D Transall
GP-CE	5097	C.160D Transall
GP-CF	5098	C.160D Transall
GP-CH	5099	C.160D Transall
GP-CJ	5100	C.160D Transall
GP-CK	5101	C.160D Transall
GP-CL	5102	C.160D Transall
GP-CM	5103	C.160D Transall
GP-DE	5104	C.160D Transall
GP-DF	5105	C.160D Transall
GP-DH	5106	C.160D Transall
GP-DJ	5107	C.160D Transall
GP-DK	5108	C.160D Transall
GP-DL	5109	C.160D Transall
GP-DM	5110	C.160D Transall
GP-EF	5111	C.160D Transall
GP-EL	5115	C.160D Transall

located at the airport at Khartoum during relief-missions by German Air Force Transall transport aircraft. DHO37 - the GAF provided transport flights in support of the US 'Operation Enduring Freedom' between late November 2001 and the middle of January 2002. Each day three Transall aircraft flew support flights to Incirlik in Turkey, and about 100 military personnel were stationed near Istanbul to provide 'stopover' servicing and operational support. These flights were thought to have been using 'JGZ' callsigns and to have operated from Ramstein Air Base.

There are probably other callsigns which may call-in from time to time, but the above list represents those that I have personally heard within the last five years.

A Typical Day On 'E' For DHM91

While preparing this article, I thought that it would be a good idea to show just how much activity occurs on 5.687MHz during a typical day, so I set about logging everything that I heard. **Table 3** details in time order for a six hour period starting at 0700.

GAF Selcalls

The GAF operates a large fleet of transport aircraft on domestic and international flights, with almost all the aircraft equipped with selcall equipment. **Table 4** represents those aircraft which I have identified with a

Table 5:

Selcall	Tail No.	A/C Type	Operator
AD-CQ	?	helo	GAF
AH-RS	?	?	GAF
BS-AB	?	helo	GAF
CK-AL	?	?	GAF
CK-BD	?	?	GAF
GH-EP	?	?	GAF
GJ-FP	?	?	GAF
GK-AP	?	?	GAF
GK-CP	?	?	GAF
GK-FP	?	?	GAF
GL-AP	?	C.160D Transall	
GL-BP	?	?	GAF
GL-DP	?	?	GAF
GL-FP	?	?	GAF
GL-HP	?	C.160D Transall	
GL-JP	?	?	GAF
GL-MP	?	?	GAF
GM-AP	?	?	GAF
GM-EP	?	?	GAF
GM-FP	?	?	GAF
GM-JP	?	?	GAF
GM-LP	?	?	GAF
GP-AB	?	?	GAF
GP-AC	?	C.160D Transall	
GP-AJ	?	?	GAF
GP-AK	?	?	GAF
GP-BD	?	?	GAF
GP-BE	?	?	GAF
GP-EH	?	?	GAF
GP-EJ	?	C.160D Transall	
GP-EK	?	?	GAF
HM-JK	?	?	GAF

selcall code, either from personal inspection of the cockpit, photographs of the cockpits, transfer from civilian to military use, or from tie-ups from the various selcall collecting groups.

The first column lists the aircraft selcall code, the second column gives the identity of the aircraft, while the third column details the aircraft type. The second column is the 'aircraft identity' which is sometimes known as the tail-number.

The selcalls shown in **Table 5** have been heard, usually working DHM91, but the tie-up to a particular aircraft is unknown. It is likely that most of these starting with 'G' are C.160D Transall aircraft. I have seen the interior of a Transall cockpit, and inspected the selcall 'black box'. It is possible

for the code combination to be changed by the crew, so it is likely that some of the above 'unknown' selcalls are simply

minor variations applied for single flights. The total number of 'known' and 'unknown' selcalls is slightly more than the number of aircraft known to have selcalls,

so some of them may be errors, misheard by listeners, or 'bad decodes' by decoding equipment.

SWM



A German Air Force A.310 Airbus (credit: J. Cayless).

Related Web Pages

Map of Germany courtesy of <http://www.scramble.nl> and <http://gheos.com>

Unofficial German military web-page (in German language) - <http://www.fighter-jets.de/>

Official German Air Force web-site (in German language only) - <http://www.luftwaffe.de/lwde/>

SSButilities Special

The USAF C-5 Galaxy on Short Wave

Over the years Graham Tanner has been collecting and collating military selcalls. For this 'SSB Special' though, he concentrates on the allocations of selcalls to the fleet of C-5 Galaxy aircraft operated by the USAF airforce

In last year's 'SSB Utilities' special issue I covered the KC-10 tanker/transport aircraft operated by the US Air Force. One of the main parts of that article was a complete listing of all the aircraft with their ALE addresses and their selcall codes used when communicating with civil ATC agencies around the world. The article must have gone down well as I received a number of letters and E-mail requests asking for copies of the article, or permission to reprint parts of it.

Other letters asked if I could cover other types in a similar fashion, and my reply was always the same - so long as somebody provides the bulk of the information, I would be willing to write it up and put it into the next 'SSB Utilities' special issue. Strangely, not many people took me up on my offer.

One of the problems with such an article is gathering the

selcall information. It is not officially published anywhere, so it has to be collected by patient listening over many months, with lots of cross-checking to weed-out discrepancies. I have been slowly collecting and collating military selcalls for a number of years, with the intention of maybe producing some more articles similar to last year's KC-10 article.

Earlier this year I had several

selcall is used by which aircraft, I thought that it would be best to present an article showing what is known and what is covered by the theory, allowing readers to use this as a basis for their own listening and investigation.

Please remember that the selcall codes in this article should be treated as a 'best guess' and must not be taken as gospel. If anyone manages to confirm any of these, please get in touch so

transport aircraft was the C-141A Starlifter, but there were items which were still too big to be carried by that aircraft. One of the early requirements was for the aircraft to transport the 74 tonne mobile-scissors bridge for the US Army.

The first C-5A was ordered during 1966 and Lockheed-Georgia Co. delivered the first operational Galaxy to the 437th Airlift Wing at Charleston Air Force Base, S.C., in June 1970. The aircraft was an immediate sensation, being much larger than the better-known Boeing 747 'Jumbo Jet'.

The C-5 was designed to be able to take-off when fully loaded within 2,530m and to be able to land within 1,493m. It is equipped with a high flotation landing gear with 28 wheels which share the entire weight of the fully loaded aircraft. One very novel feature of the landing gear is the ability to raise and lower any leg individually to allow maintenance or replacement of wheels or tyres. To allow the easy on-load and off-load of cargo, it has nose and aft doors that open the full width and height of the cargo compartment. It is possible to off-load one set of cargo from the front while another load is prepared for flight and loaded at the rear.

To assist in the loading and unloading of cargo, there is a "kneeling" landing gear system which permits lowering of the parked aircraft so the cargo floor is at truck-bed height. When moving wheeled or tracked vehicles there are full width drive-on ramps at each end allowing the loading of double rows of vehicles.

The forward upper deck accommodates a crew of six, a relief crew of seven and eight mail or message couriers. The flight deck has seating for the pilot, co-pilot, two flight engineers and two loadmasters. The upper-deck's forward and rear compartments have galleys for food preparation, as well as lavatories.

The C-5 Galaxy is powered by four TF39 turbofan engines,



Lockheed C-5B Galaxy at the RAF Mildenhall Air Fete in 2001. The open nose allows out-sized loads to be easily moved in and out. The spectators in the foreground show the massive proportions of the aircraft. (Photo: Graham Tanner).

E-mails from Rob Knapp in Leeds concerning the allocation of selcalls to the fleet of C-5 Galaxy aircraft operated by the US Air Force. As a result of these E-mails and Rob's remarkable observations, we have been able to piece together a reasonably complete list of selcall codes for these aircraft. I would rather present the 'full picture' of an aircraft, but as it is so hard to get confirmations of which

that I can update fellow readers via my monthly column.

Lockheed C-5 Galaxy - The History

The Lockheed C-5 Galaxy came about following a USAF requirement for a huge long-range transport aircraft, able to fly non-stop across the oceans, carrying outsized cargo. At the time, the largest USAF jet

rated at 43,000 pounds thrust each. They weigh 3,555kg each and have an air intake diameter of more than 2.6m. Each engine pod is nearly 8.2m. The aircraft has 12 internal wing tanks with a total capacity of 194,370 litres of fuel. A full fuel load weighs 150,820kg. A C-5 with a cargo load of 122,472 tonnes can fly 2,150 nautical miles, offload and fly to a second base 500 nautical miles away from the original destination - all without aerial refuelling. With aerial refuelling, the aircraft's range is limited only by crew endurance. This truly is a monster of an aircraft.

In the middle of the 1980s the USAF realised that they would need a replacement aircraft for their fleet of C-5s,



A C-5A Galaxy over the Golden Gate Bridge in San Francisco (USAF photo).

and after much discussion, the production line was re-opened and a further 50 aircraft were manufactured and delivered by Lockheed. These newer aircraft were the C-5B model and include all the C-5A improvements as well as more than 100 additional system modifications to improve reliability and maintainability, but otherwise they were externally identical to the C-5A variant.

The final variant is the C-5C, of which there are just two aircraft converted from earlier C-5As. The two C-5Cs were developed for a specific NASA mission, the transportation of Solid Rocket Boosters for the Space Shuttle, but they are available for other outsized loads. In the C-5C the upper rear passenger area was removed and modifications were made to the rear loading doors.

Lockheed C-5 Galaxy - The Operators

The USAF fleet of C-5 Galaxies is 126 aircraft which are currently operated by two front-line

units, a training unit and two Air National Guard units.

The front-line units are the **60th Air Mobility Wing (AMW)** based at Travis Air Force Base in northern California and the **436th AMW** at Dover AFB in Delaware. The training wing is the **97th AMW** at Altus AFB in Oklahoma.

With the Air National Guard the C-5 is operated by the **137th Airlift Squadron** from Stewart

International Airport in New York State.

Lockheed C-5 Galaxy - The Numbers

In previous years I have mentioned the C-5 Galaxy and given a list of aircraft tail-numbers and also their ALE addresses. I do not intend to repeat that information here, so please refer to the 'Reaching Out' feature in the June 1998 issue of *Short Wave Magazine*.

Presented below is a summary of selcall codes allocated to USAF C-5 aircraft. The layout is slightly different in that it is listed in selcall code sequence and for each selcall code I have listed the aircraft tail-number using that code. This is based upon an original idea from Rob Knapp. For example, the selcall code 'BF-DR'

Table 1: Selcall, tail number tie-ups known and assumed (assumptions in red).

Selcall	Tail Numbers	Tail Numbers	
BC-AQ	66-8304	69-0025	86-0020
BE-QR	66-8305	69-0026	86-0021
BF-DR	66-8306	69-0027	86-0022
BF-HS	66-8307	70-0445	86-0023
BJ-DR	67-0167	70-0446	86-0024
BL-AR	67-0168	70-0447	86-0025
BL-AS	67-0169	70-0448	86-0026
BM-ES	67-0170	70-0449	87-0027
BM-FP	67-0171	70-0450	87-0028
BQ-AG	67-0173	70-0451	87-0029
?	67-0174	70-0452	87-0030
BQ-FM	68-0211	70-0453	87-0031
BR-FP	68-0212	70-0454	87-0032
BR-QS	68-0213	70-0455	87-0033
BS-AC	68-0214	70-0456	87-0034
BS-AD	68-0215	70-0457	87-0035
DF-GS	68-0216	70-0458	87-0036
DG-EP	68-0217	70-0459	87-0037
DM-LS	68-0219	70-0460	87-0038
DM-PR	68-0220	70-0461	87-0039
DP-CS	68-0221	70-0462	87-0040
DQ-BP	68-0222	70-0463	87-0041
DQ-CE	68-0223	70-0464	87-0042
DQ-GM	68-0224	70-0465	87-0043
DR-AH	68-0225	70-0466	87-0044
DR-AJ	68-0226	70-0467	87-0045
DR-AL	69-0001	83-1285	
DR-BJ	69-0002	84-0059	
DS-FP	69-0003	84-0060	
?	69-0004	84-0061	
?	69-0005	84-0062	
DS-GM	69-0006	85-0001	
DS-MR	69-0007	85-0002	
FH-MQ	69-0008	85-0003	
FH-PR	69-0009	85-0004	
?	69-0010	85-0005	
FP-DL	69-0011	85-0006	
FP-EG	69-0012	85-0007	
FP-JR	69-0013	85-0008	
?	69-0014	85-0009	
FR-PS	69-0015	85-0010	
FR-QS	69-0016	86-0011	
FS-AB	69-0017	86-0012	
FS-AC	69-0018	86-0013	
FS-AD	69-0019	86-0014	
FS-AE	69-0020	86-0015	
?	69-0021	86-0016	
FS-AP	69-0022	86-0017	
FS-BJ	69-0023	86-0018	
FS-BK	69-0024	86-0019	

Lockheed C-5 Galaxy - Web Links

USAF Fact Sheet - http://www.af.mil/news/factsheets/C_5_Galaxy.html
 Lockheed Fact Sheet - <http://www.lmtas.com/products/airmobility/c5/>
 FAS Fact Sheet - <http://www.fas.org/man/dod-101/sys/ac/c-5.htm>

is carried by three aircraft - those with tail-numbers 66-8306, 69-0027 and 86-0022.

In a number of instances there are selcall codes that are unknown, but are assumed to exist so that the sequence is correct. Based upon listener loggings and the occasional personal inspection of a C-5 cockpit, we have been able to

confirm the tie-up between selcall-code and aircraft tail-number. Once the pattern emerged it was relatively simple to work out the theoretical code for each tail-number, which then indicated where there were 'unknowns'. In **Table 1**, those in brackets are only suspicions or assumptions, but you can clearly see the pattern. **SWM**

RadioSport NEWS

London Show moves to bright new venue

With the closure of Lee Valley Leisure Centre, the traditional venue used for the **London Communication & Computer Show**, the organisers were presented with the challenge of finding a new venue that would suit all parties. After no less than nineteen shows at 'Picketts Lock' the expectations of visitors to London Shows was that they should be held in bright, modern, large venues that are easy to reach and free to park at, but few such places exist in or around London.

After a long and exhaustive search, the organisers came across a new venue which not only met all the criteria but is conveniently located off junction 25 of the M25, the motorway junction that many visitors to London Shows have been using for years.

THE NEW VENUE

Wodson Park is a leisure centre that is similar in many ways to 'Picketts Lock', except that it is located a few miles outside the M25. Getting there is every bit as easy by car, indeed the journey time from the M25 is practically the same as it is to Picketts Lock.

Wodson Park is quite a new venue, so it has all the facilities that you would expect - a good sized catering outlet, a passenger lift, two bars and facilities for the disabled.

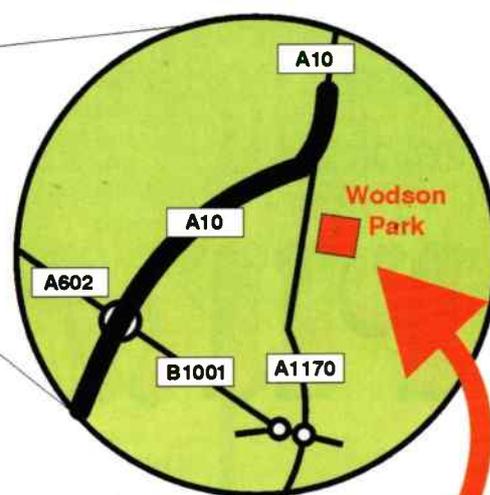
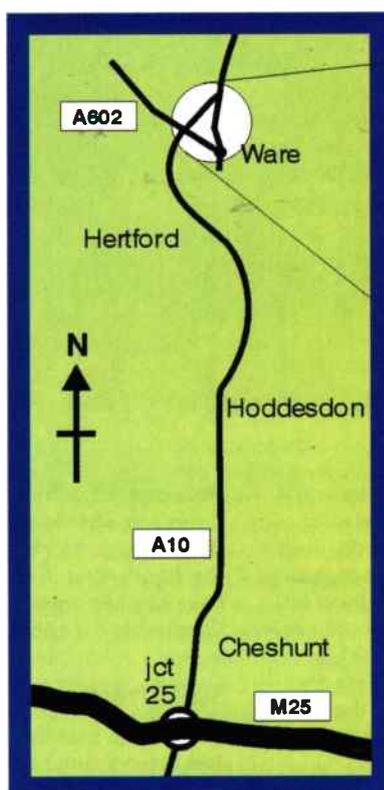
REASONS TO GO

Apart from meeting friends new and old, there will be major retailers, computer systems, software and

London COMMUNICATION & COMPUTER SHOW



Saturday 23 November & Sunday 24 November



**Wodson Park
Wadesmill Road
Ware, Herts SG12 0UQ**

upgrades, on-demand Morse Tests and Assessments, and Special Interest Groups. Southgate ARC's Bring & Buy completes the list.

All-in-all it should be well worth visiting.



In its early years, radio was just about as hi-tech as space travel is today...but pirate activity really came into its own following World War II. Dave Roberts explains.

As soon as radio was invented, governments licensed it.

The above phrase is as true as the more famous one about nothing being certain in life other than death and taxes. In its early years, radio was just about as hi-tech as space travel is today. It really was pushing science to the limits. Although an extremely new medium, radio had hobbyists even in those days. Before the first amateur radio 'Artificial Aerial' licences were issued, keen experimenters were operating home-built equipment illegally.

Notwithstanding this inescapable fact, these guys went on to become licence holders, innovators, development engineers and ended up playing a large part in winning World War II. Not bad for a bunch of radio pirates! Radio piracy continues today.

Other than the radio entertainment broadcasts from illegal stations that pop up everywhere from medium wave to v.h.f., there has been, in Europe, a long history of illegal communications traffic. An old friend of mine who has held an amateur licence since 1927 tells

advanced radio equipment ever made.

In the years following the war, they were gradually rotated back to the UK from their duties in occupied Germany. The radio operators would still be in contact with their units remaining in Europe while on duty in Britain, but as they eventually returned to civilian life...well so did a whole load of radio kit.

Look through any old copy of the radio magazines of the fifties and you'll see adverts for ex-military radio kit. Most of it at pretty cheap prices. This equipment was familiar to the ex radio operators and some of them put their hands in the pockets of their 'demob' suits and bought a set or two, perhaps from one of the fascinating radio shops that used to lurk in Tottenham Court Road or Lisle Street. These fellows found that they could keep in touch with their old comrades still on duty in Germany and with other similarly equipped ex services personnel elsewhere.

They started off using frequencies around 6.5MHz. Originally on a.m. and c.w., they migrated to s.s.b. when reasonably priced equipment became available, or they made

everything and contacts are very informal, although callsigns of some sort are used. They seem indifferent to the risk of detection by the authorities and often seem to give information on the air as to their locations. These spiritual descendants of the old days just don't seem to care.

Six and a half megs introduced some of these folks to hobby radio and a whole load of these guys eventually migrated to legitimate amateur operation. Although the 6MHz band is very popular, there are other parts of the spectrum that receive attention from unlicensed operators. Take, for instance, 3.4-3.5MHz. Users of this band tend to use a calling frequency around 3.475 I.s.b. and I have heard people in Europe and the UK on this one all mixed up with other communications traffic including fishing boats, known as the 'Fishphone'. Do these fishermen have any licences to lose? They pop up everywhere and their main hobby seems to be swearing.

All Over The Spectrum

Pirates seem to be all over the spectrum and they can sometimes be heard on

PIRATE RADIO

me of the days when he was a lad and he and his mate, having learned the code, used to have a Morse contact across the town where they lived on around 6MHz. This would have been about six years before he took out a licence. These two bright boys were not the only people at it. There were many others.

In The Beginning

Pirate activity came into its own following World War II. Just think how many people were trained in radio at that time. Most of these men had no experience of anything more technical than a push bike, up until they found themselves in the military and operating some of the most

their own kit. In the sixties, these contacts were known as the 'SK' nets. More recently, the frequencies in this region have been known as the Echo Charlie band, I know not why.

Still There

Don't think that this is all over. Just listen around 6.500 to 6.900MHz and you'll hear them. Their two calling frequencies seem to be 6.670 and 6.675MHz on I.s.b. Rightly unpopular with the Oceanic air traffic controllers whose band this is, they are audible throughout the UK and Europe and I have heard people calling in from all over Britain and the Republic of Ireland.

You can hear these pirates talking about anything and

13MHz. I have listened to 13.995 u.s.b. being used as a calling frequency with contacts being made within a few kilohertz of that frequency. Again all these operators seem to use callsigns that they make up themselves.

By far the most prolific pirates are on the 26 to 28MHz region of the bands. This all started in the USA where CB radio has been in use for decades. Of course, there were CB ops in the States that modified their kit or purchased other equipment and started operating out of the official Citizen Bands. Sometimes called 'Freebanders', these operations continued for years.

In the early seventies, more of the US specification gear started to filter into the UK.

Some came in via American servicemen stationed here or in Europe. Other equipment was brought in from across the Atlantic by visitors returning to Britain or by holidaymakers returning from vacations across the Channel.

Eire was also a source of these transceivers. Some of the equipment was manufactured with so many bands and modes that I was once shown a CB set by a man from the Radio Investigation Service which, he assured me, wasn't legal anywhere in the world! In those days I owned a Hallicrafters S27 receiver that weighed so much that it almost caused me permanent damage when I carried it to the upstairs radio room. That thing just vacuumed those signals.

Illegal Still

These days the old radio is long gone, but the signals are still there. People in the UK are still using illegal CB and are operating on a.m. and s.s.b. in, or just out of, the CB allocations. Believe it or not, there is an international calling frequency, which I believe is on 26.285 u.s.b., and they even run an international packet radio network on 26.740MHz. Local packet contacts are catered for on 26.965 f.m.

You want to hear c.w. or teletype on CB? Well listen to 27.500MHz. Higher up 27.555 on u.s.b. is another international calling frequency and these folks are even sending slow scan TV on 27.700MHz.

Boy, do these people make themselves unpopular with the authorities and with amateurs when they stray into the 10m band, but they are still there. Again many of them have become amateurs over the years and much of the equipment that they had been using was amateur radio gear anyhow.

Another area of the spectrum which is becoming popular with illegals in Britain are those frequencies

allocated to the Family Radio Service (FRS) and General Mobile Radio Service (GMRS) in America. The FRS uses hand-held radios, which is often identical in appearance to the PMR446 stuff we use here.

The Motorola units are a case in point. Outwardly they look just the same, but the FRS sets use frequencies in the 462 and 467MHz ranges and the PMR 446 uses, well....446MHz.

People go on their holidays to America and buy these handy talkies and bring them on home. Also GMRS radios are available in stores all over the States. Not surprisingly, these radios are being used here too. The frequencies used by

this kit are shown in **Table 1**. The power permitted is half a watt, modulation type is f.m. GMRS frequencies include those in the 462MHz section of the FRS band and in addition have channelised two frequency operation, see **Table 2**.

Again all are f.m. Much higher power is permitted in America depending on the equipment type in use and so you may hear these radios being used in Britain over reasonable distances.

That's not all. Again the

Americans have allowed even more equipment to go on open sale. They retail sets that operate on 151.820, 151.880, 151.940, 154.570 and 154.600MHz. All f.m. and with a maximum output of 2W. In the States this is the v.h.f. CB allocation.

Examples of all this equipment has been illegally imported into Britain and are in use here. Just listen around.

They don't care in Europe do they. I have heard that in the Benelux countries they are using 482-487MHz for nattering with a calling frequency of 485.500 f.m. Only using low power they claim to have made contacts over large distances. I haven't heard them myself, but you can bet that someone here is at it too.

There are even rumours of pirates using old satellite TV gear to make contacts on 13.305GHz. Just think for a moment. These are just hobby pirates. The individuals using these frequencies are doing so for fun.

Using Second-Hand

Now take into account those people who are using second-hand equipment purchased

from bankrupt taxi or courier businesses or from Internet auction sites. Many of these users are buying radio equipment for commercial use with a minicab firm or similar. Some security and surveillance operators will use any old radio that they can get their hands on.

I was made aware that one purchaser acquired a number of ex-military Racal TRA-967 transceivers at a radio show last year. I heard they were bought for a security company. No doubt some scannist somewhere will be able to hear them in use. For the casual listener, most of these illegal users are hard to identify as they will be on frequencies that are allocated to commercial licensees and will sound, to us, like many other legitimate users of the spectrum.

Possessing a licence to engage in any activity implies that the licence can be revoked and some folks just have a pathological hatred of this kind of regulation with its attendant restrictions. Call them free banders, free loaders or free spirits - you can bet that although more and more radio communications are going down the digital route, there will always be pirates to listen to on our radio receiver.

SWM

Table 1: FRS sets use the following frequencies.

MHz
462.5625
462.5875
462.6125
462.6375
462.6625
462.6875
462.7125
467.5625
467.5875
467.6125
467.6375
467.6625
467.6875
467.7125

Table 2:

MHz
462.550
462.575
462.600
462.625
462.650
462.675
462.700
462.725
467.550
467.575
467.600
467.625
467.650
467.675
467.700
467.725



WATERS & STA

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MAIN STORE:

• 22 MAIN RD, HOCKLEY, ESSEX, SS5 4QS • TEL: 01702 206835/204965 • FAX: 01702 205843
 • ORDER LINE: 08000 73 73 88 • E-MAIL: sales@wsplc.com • WEB: www.wsplc.com • HOURS: MON - SAT 9am - 5.30pm

MIDLANDS STORE:

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 • FAX: 01629 580020 • E-MAIL: info@lowe.co.uk • WEB: www.lowe.co.uk • HOURS: MON - FRI 9am - 5.00pm SAT - 10am - 4.00pm

SCOTTISH STORE:

• 20 WOODSIDE WAY, GLENROTHES, FIFE, KY7 5DF • TEL: 01592 756962 • FAX: 01592 610451
 • E-MAIL: jayceecomms@aol.com • WEB: www.jayceecomms.com • HOURS: TUE - FRI 9am - 5.00pm SAT - 9am - 4.00pm

TIVOLI AUDIO MODEL ONE CONSOLE RADIO RECEIVER

NEW

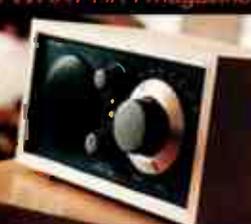
VARIOUS WOOD FINISHES

Top class compact AM/FM broadcast radio
 Superior audio/great sensitivity

5 STARS in WHAT HI-FI magazine

£99
 Plus £9.00 Carr.

ONLY FROM LOWE'S STORE



REPLACE YOUR FACTORY-SUPPLIED ANTENNA AND HEAR THE DIFFERENCE!



- **W-801MkII Regular Gainer**
 Just 21cm long with BNC fitting it covers 25 - 1900MHz. You'll get smoother reception with improved matching to your scanner, which means better signals. It's flexible as well, so you won't break it. **£12.95 A**
- **W-881 Super Gainer**
 Watson have engineered this flexible antenna to give you wide gain over the range 25-1900MHz. Optimised matching brings in those weak signals and the BNC fitting matches most popular scanners. **£19.95 A**
- **Don't forget** - we also have the WSM 1900 Mobile Gainer for your car with magnetic base and 2.75m coax cable terminated with BNC plug. **£22.95 A**

Uniden-Bearcat UBC-220XLT



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

£119
 Plus £6.00 Carr.

STEEPLETONE MBR-7 MULTIBAND RADIO

SPECIAL OFFER

£49.95
 Plus £6.00 Carr.

- Receives MW / LW / SW1 / SW2 / FM / AIR MB FM
- Direction Finder • Telescopic Antenna • Tuning Control with Fine Tuning • Volume • Tone Controls • Signal Strength • Battery Meter • AFC Switch • PA Facility with External Mic Socket • Line-in Socket for use with CD or Cassette Player • Earphone Socket • Cloth Carrying Strap • Facial Protection Bars • Powered by Mains or Batteries (Nbt supplied)

VR-120D RECEIVER

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

£159
 Plus £6.00 Carr.



YUPITERU MVT-7100EX 100kHz - 1.65GHz

Probably the best value for money it has stood the test of time and is very sensitive. Offers:

- USB, LSB, CW, AM, FM, WFM
- 1,000 memories
- 500 Pass channels
- 12 Tuning steps
- Fast scan speed
- Rechargeable batteries, AC charger and telescopic antenna.

£229
 Plus £6.00 Carr.



UBC-3000XLT

- 25MHz to 136MHz
- 400 Ch. 20 Banks
- 10 Priority Channels
- Automatic store
- Twin Turbo Scan & Search
- Scan rate: 100 ch per sec
- Data skip feature
- Selectable Attenuator
- Modes: AM, WFM, NFM
- LCD with back light
- Ext. speaker jack 3.5mm
- Ext. earphone jack 2.5mm
- Rechargeable battery (Shrs)
- Power requirements: 6.5V DC
- Size: 58 x 46B x 38mm
- Weight: 366g

£169
 Plus £9.00 Carr.



AOR AR-8600

AOR's exciting new scanner

- 500kHz - 2040MHz
- 1000 Memories
- 37ch sec scan
- RSP32 PC interface fitted
- 10 MHz/Hz II for SDUs 500
- Accepts up to 5 slot in cards
- Detachable MW bar aerial
- FM AM SSR CW
- 2000 pass frequencies
- B.33kHz airband steps

£649
 Plus £9.00 Carr.



Fairhaven RD500VX Radio Database Receiver

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

£749
 Plus £6.00 Carr.



Yupiteru MVT-7300

- NFM, WFM, NAM, WAM, LSB, USB, CW
- 521kHz - 1320MHz
- 1,000 memory channels
- High sensitivity
- Signal strength meter
- High speed scanning & searching
- Monitor button
- Descrambler function
- Telescopic rod antenna
- Clock timer function
- Variable colour display
- Key illumination
- Clone function
- B.33kHz airband spacing
- 12V DC - 230V AC mains

£259
 Plus £6.00 Carr.

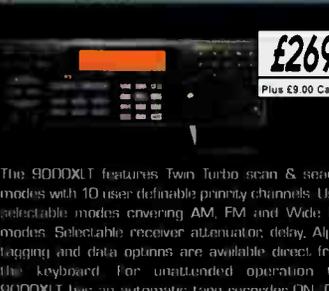
NOW WITH NICADS & CHARGER



BEARCAT UBC - 9000XLT BASE STATION

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

£269
 Plus £9.00 Carr.



AOR-7030 RECEIVER 0kHz - 32MHz

Needing little introduction, this receiver has become a classic of design. Features USB, LSB, CW, AM, FM,

- 100 Memories • Dual VFOs • Resolution to 10Hz
- Clock and Timer • Variable Bandwidth • Wide Dynamic Range • Seamless Tuning using Single Loop DDS • Clear LCD Readout • Infrared Remote Controller • AC Power Supply

£749
 Plus £9.00 Carr.

AR 7030 • £8/9 C

YAESU VR-5000

Yaesu's exciting new scanner

- 100kHz - 2599MHz • FM AM SSR CW
- Real time band scope
- DSP Noise and notch filters (with optional DSP 1)
- 2000 Memories • Optional digital voice recorder
- Large digital display • Super Hi! performance
- Ultra sensitive • Fully programmable

£599
 Plus £9.00 Carr.



YAESU VR-500

This lovely little scanner from Yaesu offers superb performance

- 100kHz - 1300MHz
- 1000 Memories
- 100 Skip channels
- 10 Search bands
- 8 Character alphanumeric display
- Band scope: Priority monitoring
- PC programmable
- Smart search feature
- Alpha numeric recall
- Size 58 x 95 x 24mm

£199
 Plus £6.00 Carr.





WDP-30 SHORT WAVE DIPOLE

NEW

8.5m long!



£49.95

Plus £6.00 Carr.

- True Dipole Performance
- Receive Only
- 1MHz - 30MHz
- 10m Long approx.
- Low noise design.
- Matching Module
- 50 Ohm Input
- SO-239 socket
- 10m Coax

This new design from Watson gives you dipole performance across the entire short-wave bands. Unlike radom wires, it reduces the background noise and pulls in the signals. And its small size means it will fit most gardens. Absolutely no adjustment required.

STREET PILOT III

NEW FROM GARMIN

IT TALKS TO YOU

"TURN LEFT IN 1 MILES"



£945.95

Plus £9.00 Carr.

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

GARMIN GPS-V

WITH WAAS
for even greater accuracy

£499.95

Plus £6.00 Carr.



The GPS V is one versatile navigator that delivers automatic routing, detailed mapping and WAAS capability - all in a compact handheld GPS. It comes with the

MapSource City Select CD, which gives you access to detailed street-level maps with locations of restaurants, hotels and other services. Use the GPS V to look up a location and it will automatically calculate a route and guide you to your destination with turn-by-turn directions and audible beeps that alert you to upcoming turns.

IC-R75 RECEIVER

30kHz - 60MHz



£599

Plus £9.00 Carr.

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

BAR-888U RADIO CONTROLLED WEATHER CENTRE



£59.95

Plus £6.00 Carr.

Desk-top display with radio-locked clock to Rugby atomic standard, inside and outside temperature recorder (with wireless remote sensor), barometer plus 24-hour forecast trend and day date information.

Order: BAR-888U

GLOBAL AT-2000 ANTENNA TUNER



£89.95

Plus £6.00 Carr.

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

ICOM IC-R8500 "EDITORS CHOICE"



£1199

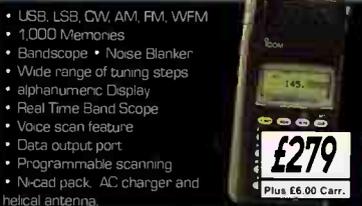
Plus £9.00 Carr.

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

The IC-R8500's all mode capability allows reception of a variety of different modes, from the world over: SSB (USB, LSB), CW, AM, FM and WFM are included, along with several 'speciality' modes, CW narrow, AM wide, AM narrow and FM narrow are available (Requires optional FL-52A).

ICOM IC-R10E 500KHZ - 1300MHZ

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



£279

Plus £6.00 Carr.

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



£59.95

Plus £6.00 Carr.

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

PCR-1000 10kHz - 1300MHz COMPUTER CONTROLLED RECEIVER



£299

Plus £6.00 Carr.

Connect this up to your PC and enjoy high quality reception with an amazing station data base and memory log. Can be used remotely from PC. Requires PC (not included).

ICOM IC-R2 500kHz - 1309MHz



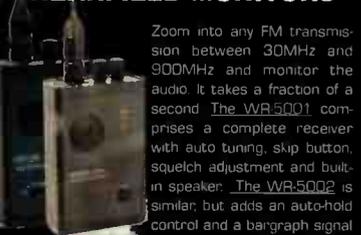
£139

Plus £6.00 Carr.

This palm size handy offers great performance. Offers

- FM, WFM and AM
- Auto squelch
- 400 Memories
- 11 Tuning steps
- CTCSS decode
- Duplex monitoring feature • PC Programmable • Built-in attenuator • Priority watch • Needs 2 x AA cells (extra) Antenna included.

NEARFIELD MONITORS



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

WR-5001 £99.95 WR-5002 £159.95

WATSON WMM-3 MkII



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

New layout - for easier hook-up to computer and rig. New modem chip - FX614 replaces old TM31D5. New modes - CD with latest programs.

£69.95
Plus £6.00 Carr.

YUPITERU MVT-9000EU MK2 100kHz - 1.99GHz



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

£369

Plus £9.00 Carr.

OPTOELECTRONICS DS-1000 DIGITAL COUNTER

SPRING PROMOTION SAVE £100



£499

Plus £6.00 Carr.

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

R-861 PORTABLE SW WITH RDS



£199.95

Plus £6.00 Carr.

- 153kHz-29.999MHz 87.5 - 108MHz
- AM, SSB (USB, LSB), FM (FM Stereo)
- AM wide narrow filter • Tone control
- AM RF Gain control • Stereo through earphones
- 307 memories • 261 SW, 18 MW, 18 FM 9 LW plus priority station
- RDS (Radio Data System) Station name, Auto time set • 3 individual alarm timers
- 110 230V auto switching AC adaptor

AOR-8200 SERIES 2 500KHZ - 2040MHZ



£379

Plus £6.00 Carr.

This wide range scanner is fitted with a data port for computer control. Features include

- USB, LSB, CW, FM, WFM
- Programmable steps
- 1000 memories in 20 banks
- Alphanumeric display
- Built-in AM antenna
- 8.33kHz steps for air band
- Rechargeable ni-cads, AC charger and helical antenna

SANYO WS-1000 WORLD SPACE DIGITAL RECEIVER



£149

Plus £6.00 Carr.

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

MFJ-461 MORSE CODE READER



IT'S BRILLIANT™

£84.95

Plus £6.00 Carr.

The MFJ-461 is a stand-alone pocket sized Morse code reader. Similar in size to the MFJ Morse tutors, all you do is hold it close to your receiver and it instantly displays CW on the 32 character high contrast LCD. It has automatic speed tracking, a serial port - if you wish to connect to a computer to display the text on a bigger screen. It can also be connected to your receiver's audio if required. Truly pocket sized at 57 x 82.5 x 25.5mm and 156g.

HITACHI KH-WS1 WORLD SPACE DIGITAL RECEIVER



£149

Plus £6.00 Carr.

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

Jon Trowsdale
G4AXE takes us
step by step
though Digital
Radio.

DAB REV

"...SET TO CHANGE
SUB-£100 DIGITAL R

interference in the amplitude domain. But there are problems with f.m. too.

The mortal enemy of f.m. is multipath distortion, where direct and reflected signals combine destructively at the receiver. This is obviously more pronounced if the receiver is in motion, such as in a car or clipped to a jogger's belt. The resulting frequency-selective fading severely disturbs the delicate stereo multiplex structure, resulting in hiss, fluttering and distortion.

We shouldn't be too hard on these venerable technologies, though; they simply weren't designed to cope with the demands of modern radio listening. Broadcasts using f.m. for example, were originally designed to be received on a fixed rooftop antenna and consumed in a leisurely fashion from an armchair. Simply, times have changed.

While DXers and s.w.l.s are happy scrabbling about in the noise and QRM, ordinary listeners in this DVD age are not tolerant of impaired quality. It's time for radio to make the leap to digital.

Eureka 147

Radio waves propagate according to the laws of physics. No matter how clever we make any new digital system, radio signals will always bounce around in an unruly fashion, especially in built-up areas. Interference, noise, fading and multipath effects will always be with us. The challenge is to minimise the impact of these effects, and even, where possible, make them work to our advantage.

That's exactly what the designers of the Eureka 147 Digital Audio Broadcasting

well-kept secret.

This lamentable situation is set to change this summer, when the first sub-£100 digital receivers appear in the shops. That, combined with a big marketing push by the radio industry, should mean that many more people will get to experience the benefits of digital radio. With that in mind, now is a good time to take the lid off this technology and outline the story so far.

What's wrong with AM & FM?

Analogue radio broadcasting has a long heritage dating back to the 1920s. Radio's first

golden age in the 'thirties relied on high power a.m. sites like Droitwich (still on air today), while f.m. broadcasts began in earnest in the 'sixties. But while these technologies have served the medium well, they are no longer up to the challenges of the digital age.

Amplitude modulation is very simple, but of course suffers from impulse interference, restricted audio bandwidth and, on long and medium wave broadcast bands, skywave interference after dark. Frequency modulated broadcasts cleverly integrate mono and stereo compatibility, offer enhanced audio frequency response and immunity from noise and

Photo: NTL Broadcast

Walk into any electrical shop, ask to see a digital radio and the chances are you'll be met with a blank stare, or at best be directed to an analogue set with a digital display. While digital television has been grabbing the headlines (good and bad!), digital radio has been quietly building up a head of steam. Currently, there are over 180 transmitters on air, from Aberdeen to Bristol, radiating over 140 services. Yet, as far as most consumers are concerned, digital radio is a

EALIED

THIS SUMMER, WHEN THE FIRST RECEIVERS APPEAR IN THE SHOPS..."

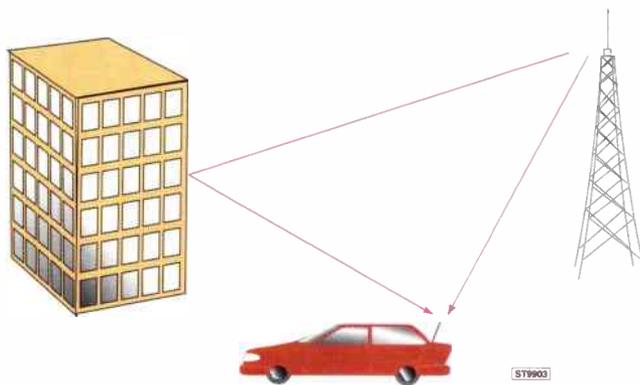


Fig. 1: Multipath fading. Direct and indirect signals travel over different paths. When path difference is half a wavelength, 180°, cancellation occurs, called fading.

(DAB) system, the digital radio standard for Europe and much of the world, set out to do. A consortium of broadcasters, manufacturers and research institutions began work in the early 1990s and in a relatively short time had delivered a fully working system. From the outset it was designed to accommodate a wide range of frequency bands and delivery methods, so there are a total of four transmission modes, of which Mode 1 is used in the UK in VHF Band III, 217.5 - 230MHz.

The system was incorporated by the European Telecommunications Standard Institute (ETSI) in 1995.

Modulation

At the heart of the new digital system is a radically different modulation scheme called Coded Orthogonal Frequency Division Multiplexing - COFDM for short. Unlike conventional analogue broadcasting, which use a single carrier, COFDM uses multiple carriers, 1536 to be precise in Mode 1.

Why?

The answer lies in those pesky laws of physics. In a single carrier system, if a severe fade occurs anywhere near the carrier frequency, it will take most of the useful signal with it. But if a multitude of carriers is used and the modulation spread across them, even a severe fade will not wipe out all the data. With careful distribution and error protection, it will be possible to reconstitute the signal from the parts that are left.

That's exactly the principle at work in Eureka 147. The carriers are spaced 1kHz apart, giving a spectral occupancy of just over 1.5MHz. Obviously compared to a narrow band

f.m. channel (the term narrow band is comparative - most amateurs would regard broadcasters' $\pm 75\text{kHz}$ f.m. deviation as sheer profligacy!), this uses much more spectrum. The justification is that this single frequency block carries an ensemble of 10 or so audio services plus associated data channels.

Because the carriers are electrically orthogonal to each other, it is possible to detect the modulation on them separately. A discussion on the delights of Fast Fourier Transforms (FFTs) and their

associated maths is beyond the scope of this article, but the adventurous can indulge their curiosity in the reference material.

DQPSK

Each carrier is modulated using differential quadrature phase shift keying (DQPSK). This is a fairly simple modulation scheme that measures the phase change of the carrier signal. As its name suggests, there are four possible phase states, known as symbols, each one of which can describe a pair of bits:

Phase change	Data pair
0°	00
90°	01
180°	10
270°	11

The phase of each symbol must be held constant for a finite time in order for the system to detect the change. In Mode 1, the symbol rate is roughly 800 symbols per second. This sounds slow, but remember that there are 1536 carriers, so the overall data rate is about 2.34Mb/s. The net payload capacity, after sophisticated forward error correction techniques have been applied, is roughly half of this.

Single Frequency Networks

From the outset, the designers of the Eureka 147 DAB system intended all transmitters serving a country or a region to operate on the same frequency. This maximises spectrum efficiency and means that listeners do not have to fiddle around retuning their radios as they travel about.

In a single frequency network (SFN), a receiver at any given location will pick up not only direct and reflected signals from the closest transmitter, but also signals from distant transmitters. This can be regarded as a longer distance version of multipath.

As long as all the signals arriving at the receiver describe the same symbol (i.e. the phase state of the carriers), during the receiver's sample period, all will be well. But if the symbols are different, destructive interference will occur and the system will fail.

In Band III, transmitter sites are generally located about

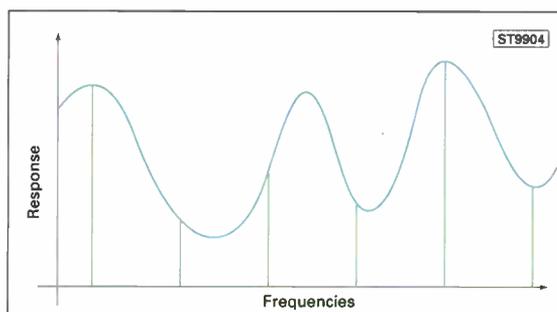


Fig. 2: Multipath effects on frequencies.

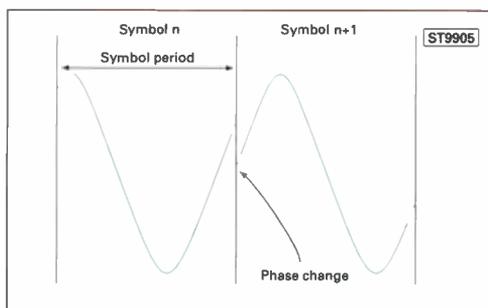


Fig. 3: Phase change at a symbol boundary. A symbol period is the length of time the phase of the carrier is kept constant. For example in DR mode 1 approximately 1.25ms.

Nevada

www.nevada.co.uk



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...ORDER ONLINE...ORDER BY PHONE...ORDER BY FAX...ORDER BY POST...OR COME

SPECIAL PRICE SAVE £150!

FAIRHAVEN RD-500VX **LATEST MODEL**

Latest database (over 20,000 frequencies)
Freq: 20kHz to 1.7GHz

~~£800~~ **£749** ^{ppp} **3 CHEQUES OF £253**

PAY BY CHEQUES/SPREAD INTEREST FREE

REVOLUTIONARY NEW HANDHELD

ICOM R3

- 495kHz - 2451MHz • 450 memories
- FM, AM, WFM, AM-TV, FM-TV
- Supplied c/w • telescopic antenna
- belt clip • charger • LI/ION batt pack

~~£449~~ **£449** ^{ppp} **3 CHEQUES OF £153.00**

PAY BY CHEQUES/SPREAD INTEREST FREE

LAST FEW AT THIS PRICE!

YAESU VR120 **SPECIAL**

- 100kHz - 1299.995MHz
- AM/FM/WIDE-FM
- 640 Memory channels

~~£169~~ **£169** ^{ppp} **3 CHEQUES OF £59.66**

PAY BY CHEQUES/SPREAD INTEREST FREE

YUPITERU MVT 7100

- 530kHz-1650MHz • 1000 memories
- AM/FM/WFM/SSB/CW
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- 500kHz - 1310MHz • AM/FM/WFM
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- 100kHz - 1300MHz
- FM, Wide FM, USB, LSB, CW, AM
- 1091 memories • Many accs available
- Comes c/w ANTENNA, CARRYSTRAP, BELT CLIP
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- Airband: 108 - 136.975MHz
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- All Mode inc. 8.33kHz AM
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- 520kHz - 1.32GHz • 1000 Memories
- 8.83kHz Airband • Duplex reception
- Descramble function • C/w Mains adaptor, NiCad, Belt clip

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- 105 - 1300MHz
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- 100kHz - 1300MHz
- ALL MODE RECEPTION
- Plus Lots More!

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PALSTAR AA30

- ACTIVE ANTENNA
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- 531kHz - 2039MHz • 1000 memories
- W-FM, FM, N-AM, AM, LSB, USB, CW
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DIGITAL WORLD BAND RADIO WITH RDS

ROBERTS R861

- Covers MW/LW/FM/SW • 307 presets
- SSB/CW recep on SW • Clock/alarm facilities
- Supplied with dual voltage AC supply, sw antenna, earphone, carrying case

~~£200~~ **£179** ^{ppp} **3 CHEQUES OF £63**

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ROBERTS R9914 DIGITAL WORLD RADIO

- Covers MW/LW/SW/FM
- SSB & CW reception
- Ideal for BBC World Service
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- Supplied c/w AC adaptor, earphone, carrying case

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ROBERTS REVIVAL 250

- 'Fifties' styled 3 Band portable radio
- LW/MW/FM
- Battery/Mains
- Wooden cabinet
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YAESU FRG-100
This receiver provides solid coverage from 50kHz to 30MHz with all mode reception of AM, SSB and CW.

~~£400~~ **£399** PPV £10 3 CHEQUES OF **£136.33**
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ICOM IC-R8500 **IN STOCK!**
This receiver is everything we hoped it would be covering 100kHz - 2GHz and lots of features including computer control.

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0.03 - 60MHz
Twin PBT built-in
PC control capability
Synchronous AM detection

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SPECIAL PRICE SAVE £100!

YAESU VR 5000 : 100kHz - 2,599MHz
Multi mode
MOBILE • Real time band scope
WIDEBAND RECEIVER • Optional filters

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530kHz-2040MHz
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Optional slot cards

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AOR AR8200 MK2	HANDHELD SCANNER	289
AOR AR-8600	BASE SCANNER	499
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MAYCOM AR-108	HANDHELD RECEIVER	55
REALISTIC PRO 2026	MOBILE SCANNING RX	125
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HITACHI KH4W51	WORLDSPACE RECEIVER	119
ICOM IC-R7000+REMOTE	WIDEBAND RECEIVER	495
PANASONIC RF-855	PORTABLE RECEIVER	65
ROBERTS 827	SHORTWAVE RECEIVER	89
SANGEAN AT818	SHORTWAVE RECEIVER	69
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- Built in speaker
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WORLDSPACE DIGITAL SATELLITE RADIO

A stylish satellite radio for home or portable use. Listen on the internal speaker or connect it to your hi-fi via phono line out or digital output connectors. Removable flip up satellite dish is supplied c/w 5 metres extension cable.

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Grundig YB400
HIGH PERFORMANCE PORTABLE SW RADIO

- 144kHz - 30MHz
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- MW/LW
- SSB reception (both USB/LSB)
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- 100-30,000kHz (0.1-30MHz) for AM Broadcast and Shortwave
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- AM, USB, LSB modes (0.1-30MHz)
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- Three built-in bandwidths for SW

EU version features

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PowerEx MH-C204F Plus Charger named "BEST CHARGER & BATTERIES" by PCPhoto Magazine 2001
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- Can be used on a 12V power supply and in a car with optional car kit (£5)
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MH-C777 plus
UNIVERSAL CHARGER AND ANALYSER

- Charge almost any Lithium Ion, NiMH, and NiCad battery packs for your ham radios, scanners, PMR 446, cellular phones, digital cameras, camcorders.
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MH-DPB140LI POWEREX LITHIUM ION POWERBANK
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- Shoot up to 2 or 3 times more photo per recharge than with the internal battery
- Compatible with Nikon Coolpix 995, 880, 885, 775, Olympus E-10, E-100, HP Photosmart 618, 912, and Minolta Dimage 5, 7, and cameras using 7.2V DC

Take MORE PIX with your digital camera

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Digital Camera External Battery Pack

- A complete solution this PowerBank battery system includes, 6V 1,800 mAh Battery Pack, 4 hour Mains quick charger, Car cigar adaptor charger, Universal Camera cable and carrying case. Compatible with most leading brands of camera.

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USE YOUR CREDIT CARD FOR SAME DAY DESPATCH...

CONTINUED FROM PAGE 31

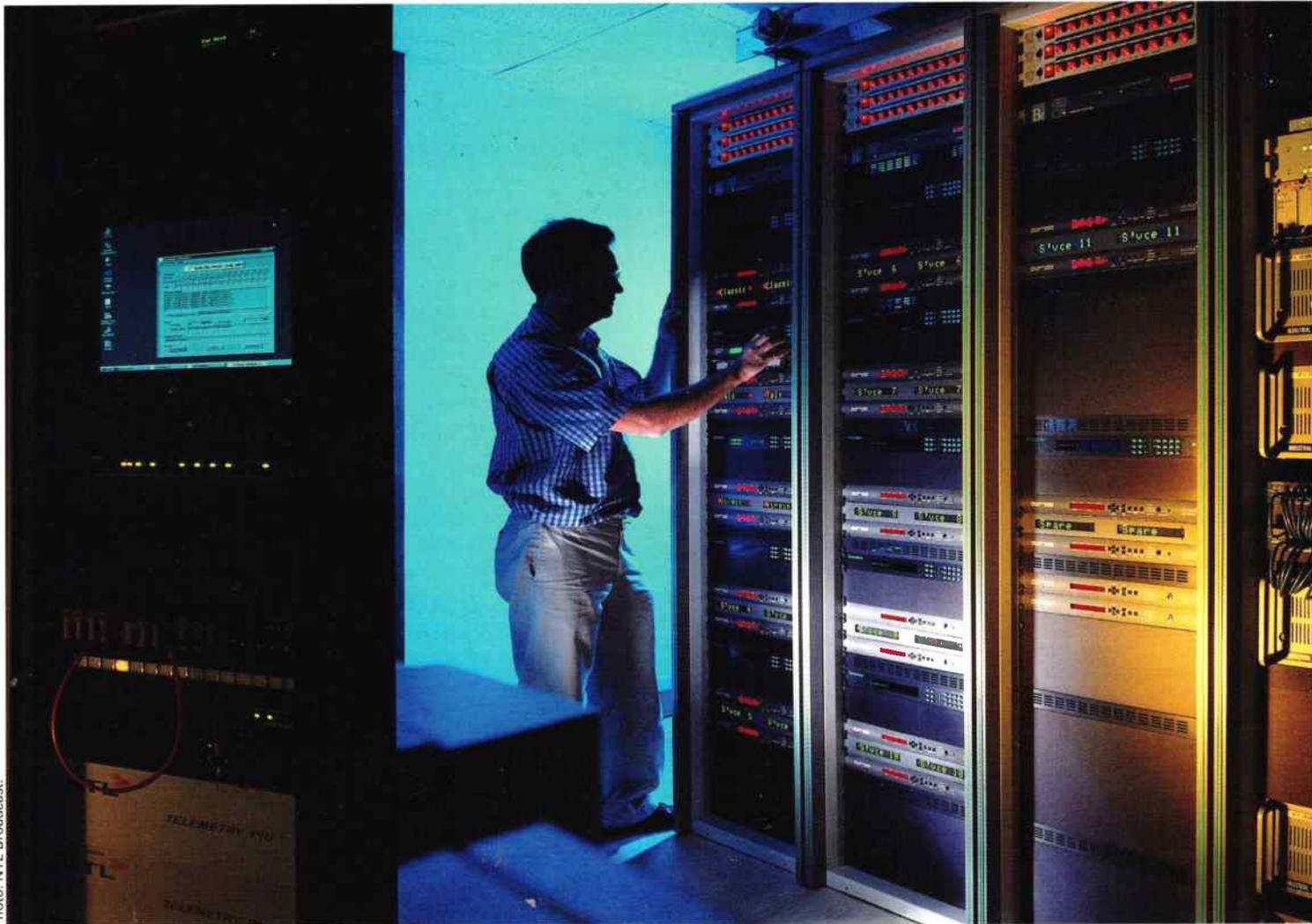


Photo: NTL Broadcast.

75km apart. This dates back to 405-line TV days. The chances of securing planning permission to build a new network of tall masts is highly remote, so it makes sense to use existing structures. The system has to be able to cope with distant signals arriving from roughly that range, which sets a limit on the maximum delay that can be tolerated.

Since the distance and the velocity of light are known, the calculation is a straightforward one, and gives a maximum delay of 0.246ms. This period is usually referred to as the guard interval. The symbol length is then the sum of the 1ms sample time plus the guard interval, giving a total symbol length of 1.246ms.

The integrity of a single frequency network depends on all transmitters radiating exactly the same symbols at exactly the same time on exactly the same frequency. Each site has to cope with fixed delays through coding equipment and modulators, and variable delays due to the telecoms distribution system. Only a few years ago, locking a major network together to the required degree of accuracy

would have been a real headache. Fortunately the highly accurate time and frequency references available from the GPS satellite system means that ensuring basic SFN integrity is relatively straightforward.

Audio Bit-Rate Compression

Squeezing ten audio channels and their associated data into the available capacity requires data compression. This ought not to be confused with compression of the audio signal's dynamic range - though of course in modern music radio there's plenty of that too!

If linear 16-bit audio were used, the capacity would quickly be filled with only one or two services, which is clearly inefficient.

The compression algorithm used in DAB is MPEG 1 layer 2, colloquially referred to as MPEG-2 or Musicam. The basis of this technique lies in a characteristic of the human auditory response known as masking.

Put simply, if you drop a Ming vase and a hatpin on to a

hard floor simultaneously, you will hear the sound of shattering porcelain but the quieter sound will be masked. This is called simultaneous masking. A related effect, non-simultaneous masking, occurs just before and after the onset of a sound, and is caused by the finite time taken for the basilar membrane of the ear to start and stop vibrating.

It follows that there is no point coding the masked sounds, and by ignoring them great chunks of bandwidth can be saved. MPEG-2 uses a bank of polyphase filters to divide the incoming audio into 32 sub-bands. The outputs of these sub-bands are quantised into individual sample allocations plus a scale factor.

Separately, an FFT process derives frequency components from the samples and thus calculates the masking effect for each sub-band. Using this information, the sub-bands are re-quantised and the redundant bits effectively discarded.

The savings that can be made are considerable. In the UK, stereo music services are routinely coded at 128 kilobits per second, with some speech

services as low as 48Kb/s. The system also offers flexibility in terms of channel coding, with mono, dual channel, stereo and joint stereo modes supported. It is also possible to mix and match the MPEG rates depending on programme requirements. A 128Kb/s channel could be divided into two 64Kb/s channels if, say, a sports programme wanted to cover two football matches simultaneously.

But like everything in life, there is a price to pay. The MPEG process can introduce audible effects known as artefacts, especially at low bit rates. And audio purists hate the whole idea of compression, claiming that it ruins the quality. But for general listeners, a well-engineered MPEG system is more than adequate, radio being, after all, a mass medium.

Because the DAB ensemble architecture is essentially based on the MPEG frame structure, it is not possible easily to upgrade the system to a more recent compression system such as MP3. This would require wholesale changes to transmission



infrastructures, and, more crucially, make obsolete all the DAB receivers currently in use.

Putting It All Together

Individual programme services and their associated data arrive at the multiplex centre from a variety of sources. In the case of an integrated broadcast organisation like the BBC, the programmes may all originate in the same studio centre. In a commercial digital radio multiplex, the programme contribution arrangements will be more complex, reflecting the fact that the services will be sourced from a number of locations.

The job of the ensemble multiplexer is to assemble these

different MPEG-encoded streams and data channels into a composite signal for onward carriage to the transmitter network. Each programme channel will consist of the audio component, plus supplementary material such as Service Information (SI), a set of data describing the name and nature of the service, and Programme Associated Data (PAD).

As its name suggests, PAD contains information directly relating to the service. Examples of PAD applications are Dynamic Label Segment (DLS), used to pass text information on a 2 x 16 alphanumeric display, and Dynamic Range Control (DRC), a way of providing user-selectable control of the programme's dynamic range. The text capabilities of DLS have proved very useful, with song titles, news tickers, phone numbers and even text messages from listeners' mobile phones all adding value to the radio experience.

It is also possible for the system to carry data-only services, such as electronic programme guides, games, web pages and so on. These

must also be multiplexed into the ensemble.

The ensemble multiplexer synthesises two channels, the Main Service Channel (MSC), and the Fast Information Channel (FIC). The main service channel consists of programme data in the form of Common Interleaved Frames (CIFs), while the FIC signals information about the composition of the multiplex to allow receivers to decode the ensemble.

The output of the ensemble multiplexer is passed to the network of transmitters either via satellite or terrestrial telecoms links. A degree of error protection is added, and this new signal is known as the Ensemble Transport Interface Network Adapted (ETI-NA) signal. It is deliberately engineered to fit into a standard 2Mbit/s telco channel.

Transmitter Networks

Final delivery of the signal to the listener is via a network of hilltop transmitter sites. For the national commercial service Digital One, a network of 70 sites is used, which reaches 85% of the UK mainland population. The BBC national network, when fully rolled out, will use a similar number.

Metropolitan and regional services use a smaller number of transmitters, anything from 3 to 12 depending on topography. A useful feature of DAB single frequency networks is that coverage 'holes' can be quickly filled by low power relays, provided of course that adequate attention is paid to the effect on other multiplexes on the same or adjacent channel.

The COFDM coding is performed at each site. A key

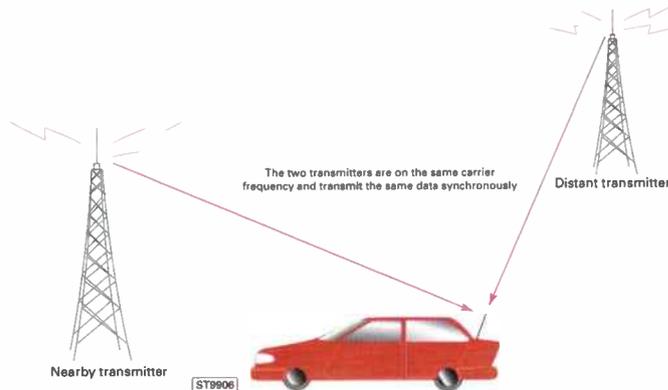


Fig. 4: Single frequency network. If the receiver is equidistant from each transmitter there is no intersymbol interference. If the receiver is closer to one transmitter than the other, intersymbol interference occurs. To overcome this, a guard interval is added to each symbol.

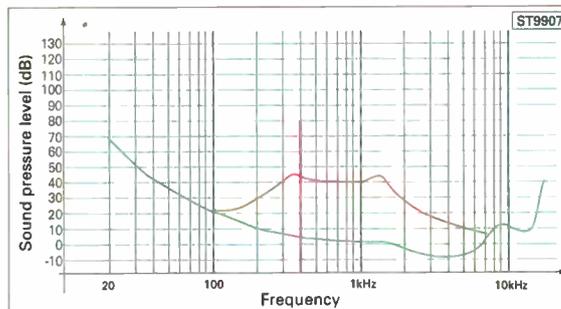


Fig. 5: Masking curve.

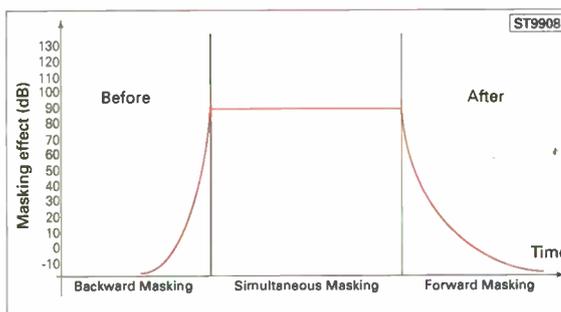


Fig. 6: Masking in the time domain.

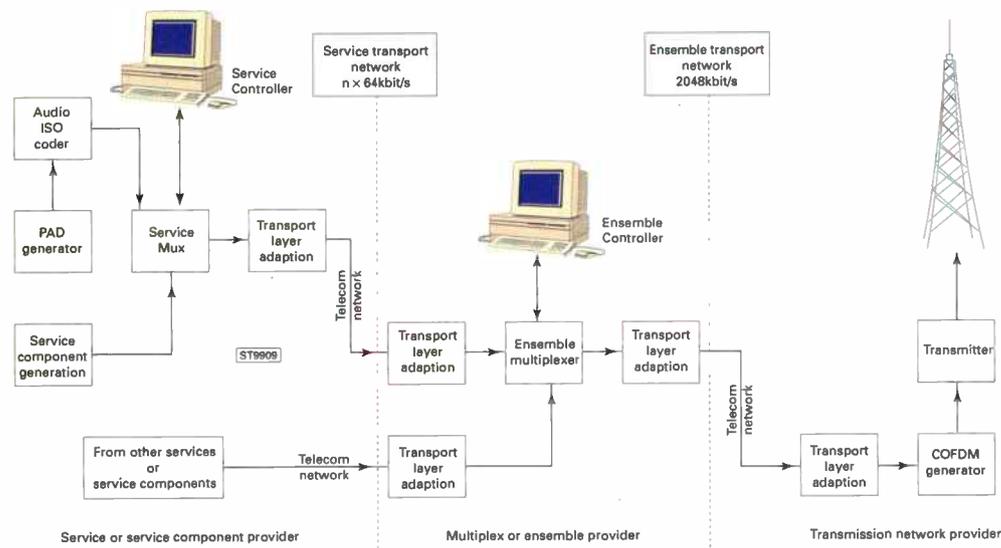


Fig. 7: The digital radio network.

CONTINUED ON PAGE 38

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Pocket scanner with 8.33kHz steps for the airband. AM/FM & WFM
Basic scanner at a basic price only **£99.00.**

ML&S £99.95

YAESU VR120



Pocket Mini Scanner 500kHz-1300MHz AM/FM and WFM.
Ideal **Go Anywhere** pocket scanner

ML&S £139.95
SPECIAL OFFER

AOR AR8200 MK II



The best Handheld Scanner available with AM/FM/CW/WFM/USB/LSB.
Frequency range: 530kHz-2040MHz PC programmable and controllable (requires PC8200 £85). Complete with high capacity NiCads, Charger, Cigar lighter lead, rubber helical wideband antenna, medium wave plug-in antenna.
Add the **Super Searcher** and **RT8200 (£119.99)** for reaction tuning to nearby transmitters

ML&S £439
ZERO DEPOSIT!
36 * £15.96

YUPITERU MVT-7100



This scanner is very old in design and lacks a few features but offers good scanning facilities. Covering 100kHz-1300MHz AM/FM/WFM/USB/LSB. Complete with NiCads, Charger, Telescopic Antenna all for **£229.00.**

ML&S £199.95

KENWOOD THF7E



NEW! The Scanner that transmits! Covering 100kHz - 1300MHz AM/FM/WFM plus SSB (100kHz - 470MHz) with Lithium Ion battery and Charger plus Transmit (6 Watts) on 2 metres and 70cms. An ideal scanner for radio amateurs! All this for only **£289.00**

PC Programmable Requires PG-4P at **£31.95**
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YAESU VR500



100kHz-1300MHz AM/FM/WFM/LSB/USB/CW. This amazing little scanner is an ideal pocket communications receiver with keypad entry!

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This is our fastest selling scanner for a long time we just cannot get them in fast enough! Covering 25-510MHz and 800-1300MHz AM/FM - plus it is the only CE-approved desktop to offer the Trunk Tracker facility. Complete with DC lead, FREE PSU and Whip Antenna - a steal at only -

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This amazing desktop scanner is the only scanner to offer true dual receive. Coverage is from kilohertz to gigahertz offering all modes and has optional DSP for enhanced shortwave reception. Complete with **FREE PSU** at only **£599.99**
PC Programmable
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MAYCOM AR108



This little airband scanner sells itself with coverage of the civil airband

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ICOM ICR2E



This little handy scanner is very simple to operate and is very popular among our commercial customers

PC Programmable Requires PC-R2 at **£39.95**
ML&S £159

ICOM ICR8500

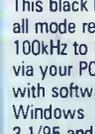


FREE PSU!

ICOM's Flagship Communications receiver covering 100kHz-2000MHz AM/FM/WFM/SSB & CW. SW performance is as good as many short wave only receivers but the VHF/UHF performance is where this radio comes into its own. Complete with **Free PSU** and Control software (Not suitable for XP or Macs)

PC Controllable
ML&S £1349
ZERO DEPOSIT!
48 * £39.91

ICOM PCR 1000



This black box gives all mode receive 100kHz to 1300MHz via your PC. Supplied with software for Windows 3.1/95 and 98. Featuring DTMF decoder, CTCSS decoder, Spectrum scope and much more. We can supply you with alternative demo software that will work with XP (Registration is under £30.00). Complete with Whip antenna, PSU, UT-106 DSP module and software.

PC Controllable
ML&S £385
ZERO DEPOSIT!
24 * £19.30

GARMIN E MAP



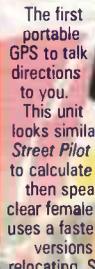
Handheld version of the Street Pilot and comes with Data Lead, 16Mb Ram Card and UK Metro Guide on CD Rom

NEW GPS V NOW IN STOCK!

GPS V has announced a hand held GPS looking similar to the established GPS3 range again with built in route calculator and 24Mb of RAM. Price expected to be about **£500**

ML&S £329
ZERO DEPOSIT!
24 * £14.48

GARMIN STREET PILOT 3



The first portable GPS to talk directions to you.
This unit looks similar to the Colour Street Pilot but has the inbuilt ability to calculate your route for you. It will then speak directions to you in a clear female voice. The **Street Pilot 3** uses a faster processor than previous versions and is much faster at relocating. Supplied with all you need to mount the unit in the car, plus 32Mb memory module, plus European City Street Map CD ROM & you get a **FREE USB Memory Programmer**

ML&S £850

GRUNDIG SATELLIT 800 Millennium



Covers Shortwave, Airband and FM Broadcast
An ideal shortwave broadcast radio - suitable both the experienced or novice listener.

ML&S £549
ZERO DEPOSIT!
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ML&S £1599
ZERO DEPOSIT!
48 * £47.31

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See what is happening on the air with this add on spectrum scope. Not only will it work with the AR5000 and AOR3000a - it will also work with Icom ICR8500, ICR9000, ICR7100 and TS-870 (A good alternative to the SM-230)

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PC Controllable
(Requires FIF232C at £79.95)
ML&S £429
ZERO DEPOSIT!
36 * £15.60

AOR AR-7030



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ML&S £799
ZERO DEPOSIT!
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JRC NRD-545



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PC Programmable
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CALL for finance

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12 * £32.05

AOR 3000A



All mode, all band desktop receiver

PC Programmable
ML&S £799
ZERO DEPOSIT!
48 * £23.64

KENWOOD TS-570 DGERX



Our best selling HF Transceiver modified for Receive only makes this an excellent DSP Receiver

PC Programmable
ML&S £949
ZERO DEPOSIT!
48 * £23.08

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CONTINUED FROM PAGE 33

requirement is to apply the strong Forward Error Correction (FEC) protection at this stage. DAB uses an unequal error protection regime, where the most important parts of the signal are most strongly protected. Also, it is possible to vary the degree of protection for any given service.

A full description of the techniques involved is not possible here, but the system consists of a combination of time and frequency interleaving together with a sophisticated Viterbi convolutional coder. The net effect is robust protection against frequency selective fading and burst errors, so that even if large parts of the transmitted multiplex are lost, the receiver can assemble a useful signal from what's left. In practice it works astonishingly well.

RF Considerations

The encoded COFDM signal is frequency converted to Band III and passed to the power amplifier stages. These are ultra-linear modular solid-state systems designed to keep working even if an individual module or device fails.

It is fairly obvious that, left to its own devices, a multi-carrier digitally modulated signal will produce horrendous intermodulation products. The linearity of the PA stages will help mitigate this, but it will come as no surprise that stringent output filtering is applied. These are multi-cavity devices that have to produce a 'critical mask' of no more than 0.97MHz offset at -71dB and no more than 1.75MHz at -106dB. Tuning of these devices is a job best left to experts!

Typical powers in use on each site range from 500W to 5kW, which seems low in comparison to current f.m.

networks. Remember, though, that these are single frequency networks exhibiting a degree of 'network gain', and that the wideband nature of the signal means lower powers can secure excellent coverage. In DAB, coverage is defined on a statistical basis, with 99% of locations served for 99% of time used as the benchmark.

Antennas are fairly conventional in design, ranging from simple dipoles on a low power site to multi-panel arrays on main stations. On

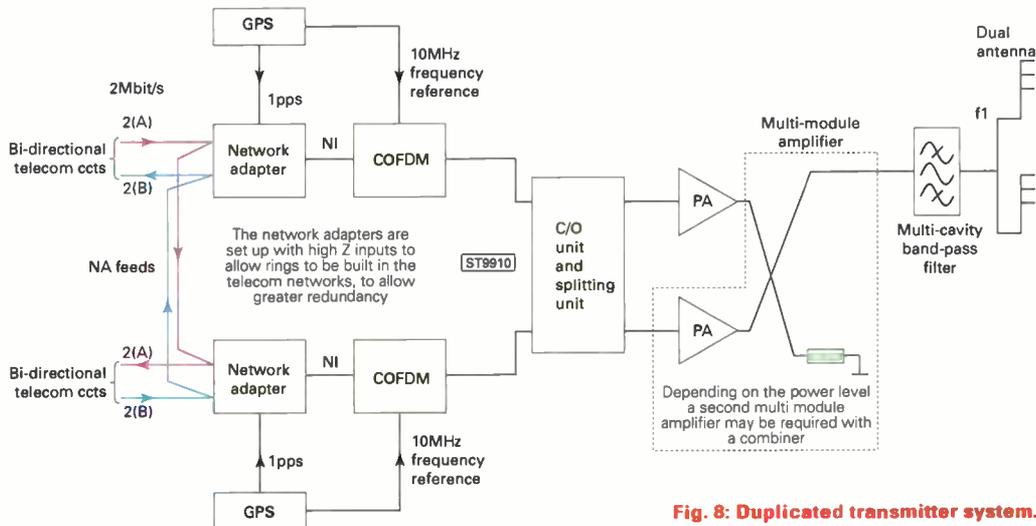


Fig. 8: Duplicated transmitter system.

some sites, restrictions on mast aperture means that the DAB Band III antennas have to be combined with FM Band II systems, another headache for the antenna engineers.

Polarisation is always vertical - domestic antenna installers please note!

Services

There is no shortage of digital services to listen to, with two national networks (the BBC and Digital One) and most major cities in the UK already covered. The BBC transmits digital versions of their five analogue networks, plus a new music service, 6music. Two additional network services are planned soon.

Digital One broadcasts a total of ten audio services, including digital versions of Classic FM, Virgin and talkSPORT. Other digital-only services range from a spoken word channel (Oneword), to a classic rock service (Planet Rock), to a service aimed at the over 50s (Primetime). Digital One

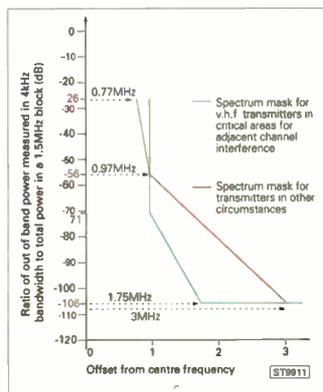


Fig. 9: Spectrum mask for out of channel radiation.

analogue services, plus many new brands such as XFM and 3C. Many BBC local radio services are now digitally enabled too.

An exciting prospect for the future is the idea of 'non-linear' radio, like the audio equivalent of a Tivo, where listeners choose what programmes they want to hear, and when. No more missing that fascinating science programme, or the latest gossip from the Black Bull!

Receivers

The very first experimental DAB receivers filled the back of a van and consumed more power than the transmitters they were listening to. The industry has come a long way since then and now offers several single-chip DAB solutions. These are starting to become incorporated into affordable designs that should hit the shops any time now.

We don't have space to explore the intricacies of DAB receiver design, but it is a fascinating topic that would be worth returning to. Suffice to say that there are exciting developments in the pipeline,

such as integrated mobile phone/DAB designs, and 'embedded' receivers in PDAs, MP3 players and so on. It may be that in the future consumers will not even be aware that they are buying a digital radio - to paraphrase Apple's Steve Jobs, the radio will be in your T-shirt.

Enjoy it

One of the paradoxes of digital radio is, despite its back-office complexity, it is astonishingly easy to use. Given a well-designed interface, programme selection is just a button or mouse click away, and other facilities are accessible through simple menus. Some radios even remember your favourite stations, offering them first. Most people, even those initially sceptical, 'get' digital radio the first time they experience it, and are reluctant to go back to analogue.

Radio has a long history of re-inventing itself in response to new challenges, emerging even healthier than before. It has survived talking pictures, world war, television, the Internet and economic recession. There is no reason to suppose that it will do anything less than enthusiastically embrace the opportunities that digital offers.

I hope this article has shown that migrating radio to its new digital platform has been no trivial task, representing several thousand man-years of research, development and installation effort. The UK is leading the world in this field, and tribute ought to be paid to the many superb engineers that have got us this far. So when you unpack your brand new digital set from its box this summer, and prepare to enjoy the delights of digital radio - spare a thought for all their hard work!

SWM

MORE INFORMATION

European Telecommunications Standard ETS 300-401: Radio Broadcasting Systems; Digital Audio Broadcasting (DAB) to mobile, portable and fixed receivers.

www.worlddab.org
www.ukdigitalradio.com
www.bbc.co.uk/digitalradio
www.radioauthority.org.uk

also carries an innovative data service, the Digizone, decodeable on the Psion Wavefinder PC radio.

On local multiplexes you will find digital versions of local

Dave Jones lives in Llanelli, in West Wales, "sadly too near a few industrial sites to consider this a good reception area" comments Dave. He holds at the moment two call signs, a full class B sign MW1DUJ and a foundation one MW3DUJ to allow restricted access to the bands below 30MHz. Transmitting does not play much of a part at Dave's station, as he much prefers listening.

The vast majority of the v.l.f./l.f./m.f./h.f. spectrum is blotted out for most of the day, so any serious listening on those bands has to be done in the 'wee small hour'. Reception is rarely affected on v.h.f. and u.h.f. Dave derives great

pleasure from his main receiving room, which isn't laid out in any sensible order, rather a matter of where things will fit.

The Main Receiving Area

As can be seen from **Fig. 1**, the main receiving area of the room consists of a mix of receivers from various past times and differing quality levels. Dave's receivers are chosen purely on personal preference rather than on the result of any test or review, any favourable review being considered a bonus. The top shelf contains



Fig. 1: The main receiving area.

various boxes full of all kinds of projects, reviews and data gleaned from magazines, the Internet and anywhere else he can find it. The next shelf down contains a now redundant AKAI tape recorder, several service manuals, a Trio 9R59DE and a small TV/VCR for watching the odd factual programmes. The VCR can also be used as an audio tape recorder, giving eight hours recording time, during which either one or two receivers can be recorded simultaneously by using the left and right audio channels separately.

Lower still, the shelf contains five Eddystone receivers, from left to right these are: 940, 670A, 830/7, 840A and an EA12. They are all general coverage receivers, with the exception of the EA12, which receives the amateur bands only. As with the vast majority of receivers, they are all 'plumbed in' with antennas and power ready for the occasional airing.

The lower shelf, again from left to right, contains firstly, an SPT RR102 general coverage receiver, meant for the passenger cabin of an ocean going liner, a Target receiver, a Yaesu FRG-9600, Eddystone EC10, Yaesu FT-847 for the almost non-existent times when Dave wishes to transmit, an AOR AR3030, JRC NRD-345 and last but not least a JRC NRD-545 with the CHE199 wideband converter, which is one of Dave's favourites, despite some lacklustre reviews. This set is perched on a cassette deck, which has been modified to include an audio amplifier and speaker, for easy review of things recorded from

the JRC. It also now has an electronic pause facility, controlled by the squelch setting on the receiver. This provides a completely independent recording facility between 100kHz and 1999MHz, used mainly for everyday chores.

Lastly, on the desktops below, again from left to right, a 52 Set ex-army WW2 receiver, this has the distinction of being the receiver on which Dave cut his listening teeth at school in the sixties, and so has great nostalgic value. Next, in an 8U case meant for disco equipment, at the bottom, is what Dave says is easily the best v.h.f./u.h.f. receiver he owns, a Norlin SR2152, which covers 20 to 520MHz, on top of that, an Eddystone EC958/7F, on top of that is a glorified clock, actually a time insertion unit, wired to the tape recorder and NRD-545 above, so that at the press of a button, a rather odd sounding voice tells the time for reference purposes. Until Dave acquired the clock, he was never able to remember when things were recorded, and lastly in this unit, a multicoupler, which takes in the signals from the roof mounted G5RV and splits it 16-ways to feed all the receivers in the picture above, and does it properly, so they do not interfere with each other, even when tuned to similar frequencies.

Next in line, a Racal RA1792 receiver, used with the PC next to it, and a Hoka Code 3 Gold decoding package, for decoding whatever comes

The Other Man's Shack

This month the Ed's off to Carmarthenshire in South Wales for a whistle stop tour of Dave Jones' listening post.

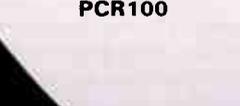
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	AR5000+3	High performance base receiver with three enhanced options factory fitted: noise blanker, synchronous AM, automatic frequency control.	£1449.00
	AR3000A	Unique all mode extremely wide band base-mobile receiver 100kHz - 2036mhz with no gaps. RS232 port fitted.	£699.00
	AR3000A +(plus)	Customised AR3000A with switchable narrow SM & SAT filters, Tape relay, SDU ready and discriminator output.	£799.00
	AR8200 Series 2	New advanced wide band all mode hand-held receiver with enhanced microprocessor facilities, slot card options available, multi-function display.	£395.00
	AR8000	The New Concept. Wide band all mode hand-held receiver with many microprocessor facilities, dot matrix display and computer compatibility.	£296.00
	ICOM R2	0.1300mhz Handie. Fits in the palm of your hand. AM/FM, FM Narrow - 450 memory channels	£139.00
	IC R8500	100kHz - 2GHz Continuous. All mode no gaps. 1000 Memories. 4IF band widths	£1440.00
	IC-R75E	Excellent all round for the professional listener	£1440.00
	IC-PCR1000 & PCR 100	0-60MHz. High Stability receiver circuit 100 DB Dynamic range. Twin bandpass Tuning. Optional digital processor. Best selling receiver	£629.00

IC-PCR1000 & PCR 100

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STREET PILOT

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- Fast tune facility gives 10 times function for quick tuning
- Built-in ferrite rod antenna for AM broadcast reception
- OP90 Soft Case

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An exciting new handheld packed with features - but at a price you can afford! The receiver has "breathtaking performance" ensuring this set is destined to be a number one seller



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- PRIORITY CHANNELS: 10
- SCAN/SEARCH SPEED: 30 per sec
- POWER: Requires 4 x AA batteries
- SUPPLIED WITH: Antenna, Earpiece, Carrying Strap and built-in Desk Stand

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ALINCO	DJ-65EY 2700 WIDE BAND TRANSCEIVER	£200.00
ALINCO	DR-590 DUAL BAND MOBILE	£175.00
ALINCO	DR-605 DUAL BAND MOBILE TRANSCEIVER	£230.00
ALINCO	DX-107 100W MOBILE/ HF	£475.00
ALINCO	DX-107H TRANSCEIVER	£475.00
ALPHA	87A FULLY AUTOMATIC AMP	£3,350.00
AMERTRON	OSK-5 2.5kw OSK SWITCH	£198.00
AOR	AR-2002 BASE SCANNER	£199.00
AOR	AR-3000A RECEIVER	£495.00
AOR	AR-3000 RECEIVER	£1,199.00
AOR	AR-7030 REMOTE CONTROL RECEIVER	£595.00
AOR	AR-8000 HANDY RECEIVER	£199.00
AOR	AR-8200 MK1 HANDY RECEIVER	£280.00
DAIWA	PS-120MK11 10amp PSU	£50.00
DAIWA	PS-30AM11 20amp POWER SUPPLY	£85.00
DATONG	FL2 FILTER	£60.00
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DIAWA	CNV-518 2KW CROSS METER ATU	£199.00
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ICOM	IC-756 HF/6M BASE TRANSCEIVER	£1,050.00
ICOM	IC-W31E DUAL BAND HANDY	£175.00
ICOM	PCR-1000 PC RECEIVER SSB/FM/AM	£200.00
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ICOM	PS-65 POWER SUPPLY	£175.00
ICOM	R10 HANDY SCANNER	£199.00
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ICOM	R-72 RECEIVER AC	£450.00
ICOM	R-72 RECEIVER DC	£400.00
ICOM	R-75 RECEIVER	£450.00
ICOM	SP-21 EXTENSION SPEAKER FOR IC-706 etc	£45.00
ICOM	T8E HANDY 2700cm	£195.00
ICOM	W-21E DUAL BAND HANDY	£199.00
JRC	JR-535 RECEIVER	£675.00
JRC	JR-545 DSP RECEIVER	£999.00
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KENWOOD	TS-590 SAT TRANSCEIVER HF/6M	£695.00
KENWOOD	TS-811E 70cm MULTI MODE TRANS	£400.00
KENWOOD	TS-850 SAT 100w HF BASE TRANS	£950.00
KENWOOD	TS-870 DSP HF/BASE TRANSCEIVER	£999.00
KENWOOD	TS-940SAT HF BUILT IN ATU BASE	£750.00
KENWOOD	TS-950 50 DIGITAL 150W TRANSCEIVER	£1,250.00
KENWOOD	TS-950S HF 150W BASE BUILT IN ATU	£999.00
KENWOOD	TS-9650X HF 150w TRANS (FLAGSHIP)	£1,799.00
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LOWE	HF-225 RECEIVER	£225.00
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along. Under the RA1792 is the matching h.f. transmitter drive unit, the MA1723, this can be used for QRP operation as it is, but normally feeds a small h.f. amplifier to transmit. On top of them is an ex-navy Morse decoder, which can be fed from the RA1792, or, better yet, from a Morse key and a small oscillator for practice purposes. Finally, another pile of Eddystones, at the top, a 990R, in the centre, Dave's very favourite receiver, an 1837 and a v.h.f./u.h.f. set, the 1990R/3, which like the 990R, is great for airband, with the filter set to wide, they come in thick and fast! Also on the shelf above, nestling between the Eddystones, is an AOR AR8200 scanner, a frequency counter and an Icom IC-T8E tri-band transceiver.

Dave has several antennas in use here, a long wire fed into a balun, a G5RV, a tri-bander for 6m, 2m and 70cm, a wide band discone and a Racal airband antenna.

Main Shack

Figure 2 shows Dave's comprehensive shack's main PC. It consists of a self-built unit comprising a midi tower case, chosen for its low radiated r.f., a 1.4GHz AMD processor, 768MB RAM, 2 x 40GB hard disks, sound card, DVD player, CD rewriter, an IYAMA vision pro 19in monitor, scanner, printer, external magneto-optical drive and best of all, a small Kodak digital camera. Dave is keen to point out that anyone who has a PC should consider seriously buying a digital camera, it opens words of possibilities. Also connected to the PC is an Icom IC-PCR1000 receiver, a great set, "JW was right!" comments Dave. On top of the desk is an Eddystone 840C a Yaesu VR5000, both of which work fine, even this close to the PC. All of these items are fed through an uninterruptible power supply.

Repair & Servicing

Next up is the repair and servicing area - see **Fig. 3**. This area is used to keep all Dave's electronic items working correctly, and to repair other equipment to finance further expansion. Most of the well over 1000 little drawers contain different types of transistor, which Dave is rather fond of collecting. Main equipment is a Tektronic 100MHz 'scope, Racal LCR meter, Solartron multimeter, Advance p.s.u., various signal generators, prototype board, etc. The mains feed to this bench and all its equipment is completely isolated from the domestic



Fig. 3: Repairs and servicing area.

supply, as are all the rest of the supplies in the room, this has greatly reduced mains-borne interference and has beneficial safety consequences.

Twin Towers

Finally, in **Fig. 4**, is what Dave's long-suffering wife affectionately calls the 'twin towers' - hopefully they will not meet the same fate! The right hand one, from the top, consists of an Eddystone 1650/6 modified to almost equal the 1650/2, next a Norlin multicoupler unit to run the eight receivers properly from an antenna, next a Racal RA6790/GM, next a Mackay MSR5050, next a Swedish set, an SRT CR91, next a Harris RF590A, next a Watkins & Johnson WJ8716, next an Eddystone 1650/2 and last but by no means least, a Lowe HF-235.

The right hand unit is not quite finished yet, as Dave tells us time is a bit scarce at the

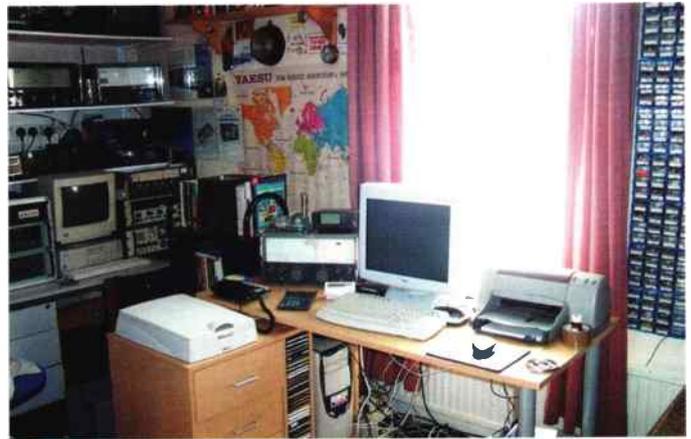


Fig. 2: The main shack PC.

moment. The space at the top will house a home-built unit that is an audio amplifier with eight switch selected inputs, under this is a Raven Research multicoupler, this is a 16-way unit, so will be replaced a.s.a.p. with an 8-way one, since only three h.f. outputs are needed. Next is a RAPCO date/time stamping unit, used as a rather elegant clock. This has a 650A car battery as back-up supply, as the unit is always disconnected from

the mains when not in use, you never know when a storm might come!

Next down is a neat unit, called a threat recorder, demobbed from the Navy, it is really four identical cassette recorders, of almost unimaginable quality, made by Bell & Howell, they treat what would be the left and right hand channels in a stereo system as separate channels, this enables Dave to record from up to eight sources here, but as there are only four receivers in the unit, the two channels of each unit are connected together, to be doubly sure of not missing a recording.

The unit mentioned that is missing from the top is an audio amplifier, with eight switched inputs, connected to the line outputs of the cassette recorders, for monitoring and

playback, there is also a feed to the PC, so that transmissions can be saved as WAV files for interchanging. Next down is Dave's pride and joy, a Racal RA3791 d.s.p. receiver (look out for a forthcoming review in SWM - Ed.). Next down is a Racal MA2313 spectrum display unit, which has two separate outputs, switchable between one another, next down is a Racal RA1795, 20 to 1000MHz receiver, a great set, this as well as the RA3791 is connected to the SDU so that adjacent frequency activity can be checked. Then onto a Racal RA6793A h.f. receiver, and last but by no means least, is another Racal RA1792.

Many thanks to Dave Jones for the express journey around his very well equipped shack.



Fig. 4: Affectionately known as 'Twin Towers'.

SSButilities *the column*

This month we start with a letter from **C. Elwell** who wants some advice about installation of a new G5RV antenna. Mr Elwell would like to install his new half-size G5RV in the loft, in either an 'inverted V' fashion or 'straight out' and wants some advice about the best way to accomplish this. All that I can really do in this instance is relate the story of how my own G5RV was installed.

Well Mr Elwell, as you will be well aware, a half-sized G5RV antenna is still over 15m long, so it is most unlikely that you will be unable to install it without bends and turns. I can only offer you advice based upon my own experiences of a loft-mounted G5RV. My own G5RV was a full-sized version, over 30m of wire, and was installed in a 12m loft such that it almost formed a complete loop. I assume that the antenna will be used for receiving, so the installation is not too critical, but if you do want to transmit using it, I think that you are going to seriously consider mounting it 'high' and 'straight' along the garden.

My own G5RV installation was as follows. Start with the centre insulator - the piece where the two wires and the ribbon cable meet - and mount that as high as you can manage in the loft. Please don't try to support this piece by hammering nails into the woodwork, as this will probably loosen or dislodge the tiles on the outside of the roof. My own original choice was to simply push a drawing pin into the woodwork and then suspend the centre piece from it. This was successful for a while, but needed a better solution.

The eventual solution was to fasten the centre-piece to some string, throw the ball of string through the woodwork, then haul it up to a reasonable height and tie off the string somewhere lower down. Ideally, this needs to be in the centre of the longest side of the loft space and with the centre-piece as far up towards the apex as possible.

Once the centre-piece is safely installed, it is simply a matter of unrolling the wire 'legs' of the G5RV, and lightly fastening the wire to the woodwork as you go. In my installation I simply fastened the wire to the wooden uprights (I am sure there is a technical name for these!) using string. As you unroll the wire, you will find that you

reach the end of the loft space, so simply route the wire to one side along the wall until you reach near to the eaves. You can then turn again and route the wire parallel to the eaves (but still inside the loft space).

Once you have unrolled and fastened one 'leg' of the G5RV start back at the centre piece again and unroll this in the opposite direction to the first leg. This is more difficult to describe and it sounds more complicated than it is. If you can imagine the layout of the wire from a birds-eye viewpoint, the wire legs form a large letter 'S' within the loft space, with the centre-piece in the middle of the 'S'. This may sound as if it is a very 'Heath Robinson' installation, but you have to remember that it is

inside the structure of the house and will not suffer from any storm damage.

It may be that your loft space slopes on three sides or possibly on all four sides, but the basic design still holds true. Install the centre-piece as high as possible within the loft space, and then unroll the wire legs down to the eaves, and then around the edge of the eaves.

However you install the G5RV in your loft, you will then need to route the ribbon cable from the centre-piece down to your receiver. This depends upon your own personal set-up. In my case, the ribbon cable leads to a balun, and then a simple coax from there to the back of the Antenna Tuning Unit (a.t.u.). This may sound like a very cheap and cheerful installation, but it does work. I managed to 'hear all continents, including Antarctica' using my G5RV.

My own G5RV antenna has seen about 15 years of constant use across three different locations, and although the ribbon cable was replaced a few years ago, it still uses the original wire 'legs' insulators and balun. By the time that these words are read, I will have replaced my trusty G5RV with a standard long-wire antenna, so next month I will let you know more about that.

Arklow

A few years ago I answered a reader's question concerning any private

maritime h.f. nets by writing about the daily 'call-up' of vessels from Arklow Shipping. I even managed to hear a number of the ships myself just to prove to myself that it was true and still an active net. Recently, while surfing the Internet I came across the web site for Arklow Shipping Limited, and as this now contains a lot of useful information for short wave listeners I thought that it was worthwhile mentioning here again.

Arklow Shipping

Limited is an Irish company founded in 1966 as a management company for a number of smaller shipowning businesses in the Irish port of Arklow. They operate a medium sized fleet of vessels in northern European waters carrying all manner of materials. As their vessels

operate over such a vast area all the vessels at sea call-in on h.f. several times a day at set times. During these call-ups the vessels report their position, and sometimes give details of their routing or next destination. All the vessels in the fleet call-up at 0815, 1215, 1615 and 2015 each day - note that these are 'local times' rather than UTC. The best frequency to hear them is **2.311MHz** which is sometimes known as the 'Irish inter-ship' frequency.

When I first mentioned this network and company in September 1996, I gave a list of ships names which I had extracted from the ITU maritime callsigns database. Using the power of the Internet I was able to find the home page for Arklow Shipping and from that page there is a link to a page which lists the entire fleet of vessels operated by the company. From this page you can click on the name of an individual ship, and then see a wealth of facts and figures about the vessel including its callsign and sometimes pictures too.



Arklow Rose (4500t) - Launched 7th December 2001.

Web Watch

Arklow Shipping -
<http://www.teamsoft.ie/Arklow/SilverStream/Pages/pUserPage.html>

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

Satellite TV News

The major news event of the past month has been the sad news of the Queen Mother's death. It wasn't just the British folk mourning this loss, but those across Europe and the World also followed the period of death and mourning. March 31st and *Europe*Star-1* is carrying news feeds for several European broadcasters including RTL German and Antenna 3 Spain, respective reporters outside Windsor Castle main gates describing the scene as local folk assemble to share their grief. This prolonged feed uplinked by NTL was carried at 12.663GHz-V, SR 5632 + FEC 3/4, service identifying as 'ntl SNG Coder 2' - 'UKI-447' from mid afternoon onwards.

A couple of days later, Meridian roll up into the same spot with their 'Meridian 8m/Bit TES' BT truck transmitting inserts into the evening magazine programme at 1800 over *Intelsat 801* @ 31.5°W, odd though using 10.974GHz-V (5632+3/4) as Meridian usually operate with BT's 'TES-43' @ 10.988GHz-V. April 8th - eve of the funeral - and *NSS-K*, 21.5°W at 1750 is running a succession of Queen Mum items at 11.550GHz-H seemingly checking the VTR tape of HM The Queen's address to the nation at 1800, this preceded with TV pictures from both outside Westminster and within the Laying in State chapel as part of a package for TV3 Espagne.

Interestingly **Edmund Spicer** (Littlehampton) when checking over the *Eurobird* slot 28.5°E confirmed that ITN have been using this slot for UK OB feeds. At 10.906GHz-V (SR 22000+FEC 5/6) 'famous for housing ITV-1 regionals', a new signal stream had appeared, though appeared in the EPG as scrambled, once selected it came up with 'ITN LINKS/UKI 506/SISlink 37' and various ITN 'phone numbers inlaid over colour bars - later cutting to a locked off Buckingham Palace shot.

Elsewhere in this slot at 12.441GHz-H (27500+2/3) there appeared colour bars + ident 'DEC-S7RM-4' + 'MSA SPG1', this is a BBC leased transponder normally used for interactive services. Just for the record, *Eurobird* TV test patterns have been seen at 12.647, 12.675, 12.695GHz-all V with various UK or German idents at SRs 5632/6111+3/4.

The Queen Mother died March 30th and I checked late afternoon across 31°W, 8°W, 7°E and 21°E for live news downlinks, but found nothing. The only flutter of OB life was on 31.5°W where I found 'Sky Leicester', 10.956GHz-V (5632+3/4), well I established the service ident and the screen remained blank merely advising 'Signal Encrypted!' Better luck for football fans on March 26th when *NSS-K* carried live pictures of Nigeria v. Paraguay at 11.547GHz-H (5632+3/4).

NSS-K has been very busy in recent weeks, it's a fairly easy satellite to receive with a 900mm dish and carries lots of international traffic. *Globecast* ch.3 (11.590GHz-V (SR 20145 + FEC 3/4) often transmits the Russian 'NTV International' TV programme over this downlink - well most of the programme since at times it carries rehearsals, locked off shots of the studio, etc., check out from about 1700 onwards.

Fans of USA President Bush can keep up with his global travels. March 21st and George is seen with a large gathering of fans in El Paso, Texas (on the Mexican border), live over the Reuters 11.462GHz feed. Two days later and George is seen arriving on 'Air Force 1' into Lima, Peru, welcomed by their president and the local military band. Evening of April 7th and it's now Tony Blair's turn

to address a large Texas gathering from the presidential podium to rapturous applause - another 11.462 payout.

The 'clocks' on *Telstar-11*, 37.5°W, these the feeds from the surveillance aircraft over the Balkans seeking out Balkans gun and drug-runners, being at work daytime I've only seen the 'clocks' in the evenings, but April 3rd I was home all day and checking out the *Telstar 11* feeder at noon (11.495GHz-H, SR 19500 + FEC 2/3) found two clocks (P-3 and C-12 MARS), but the 'AIRSCAN UAV' image showed aircraft surveillance in flight, high flying over the terrain and then zooming into buildings, vehicles, etc. The flight was first noted in action at 1200 and still active two hours later. The downlinks are still unencrypted.

Roy Carman (Dorking) also monitoring *W2* found an Afghan military edited package March 13th, this a press conference at Bagram Airfield discussing latest successes with the 10th Mountain Division + 1st Airborne Assault Force (Kentucky) against the cave lurking Al Qaeda and Taleban 'remnants'. That same day *Europe*Star-1* @ 45°E, the usual satellite source for signal linking into Europe carried more military footage, 11.545GHz-V (5632+3/4) - service ident 'SNG BROADCAST'. Roy noted US attack helicopters scouring the mountainsides for more resistance pockets though the pictures of gory corpses were less than exciting, as were the sight of bodies in various stages of decay - with flies - this is the face of war that the UK broadcasters generally filter out.

Last month I mentioned that Harris had been advertising cheap satellite carriage on their 50°E Anatolia satellite, two satellite enthusiasts have reported their first digital feed sightings on this bird, 21st March. Picture content was of more Israeli carnage from suicide bombing using 11.128GHz-V with unusual SR 4686 + 3/4, service identifying 'NETZ-1'. At the time of writing, this isn't really established as a sat linking platform and like *SESAT* at 36°E, video linkage will be erratic - patience and sheer luck will be needed to find anything.

I often receive queries as to suitable 'DXing' satellite receivers so I've been evaluating a couple of inexpensive Free to Air (FTA) digital satellite receivers, these the Manhattan 'DigiPlaza' (Eurosat) and the GB Sat 'FTA 0' (HiSat, Bristol) and their suitability or otherwise in the news/OB feed environment - most receivers will work OK for general TV entertainment where signal levels are usually high, but the Sat-Zapper needs something a little more demanding.

These two models - selling retail around £160 - were compared to the now five year old classic *RSD ODM-300* FTA model. Initial observations confirm that the 'new' units are very much faster in locating signals, the 'FTA-0' in perhaps a second. 'Difficult' signals that often appear as 'signal encrypted' on the *RSD* - when they're not actually encrypted - will lock up on the new receivers. Thresholds are about the same, but the problematical Reuters 11.462GHz *NSS-K* signal proves difficult to maintain solid image lock on the newies. The *DigiPlaza* has an auto FEC, but you need to input the symbol rate - and it won't tell you the locked FEC parameter! The 'FTA-0' can either take auto or manual input FEC, but again input symbol rate is necessary and needs to be exactly correct for image lock. The lack of auto SR is bad news, but the receivers are very easy to use and simple to tune. Looks promising! More later...



The American forces control centre in the Balkans providing air surveillance, via *Telstar 11* @ 37°W.



The 'Airscan' surveillance downlink surveys several buildings before zooming in to close-ups.



VTR pre-roll clock for the controversial Arabic 'Al Jazeera' TV channel.



Shivering RTL reporter outside Windsor Castle, the 'NTL SNG Coder 2' circuit linking over 45°E.



The French TF1 have a Rome office and news studio...31.5°W.



An unknown TV channel featuring mainly (anti?) Iraq content, seen via *NSS-K*, 11.618GHz-V, March 26th.



And We have live TV pictures from Lima, Peru...via *NSS-K*.

■ PETER BOND, c/o EDITORIAL OFFICES, BROADSTONE

■ E-MAIL: skyhigh@pwpublishing.ltd.uk

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Now that I have been writing the combined airband column for about nine months, a more balanced picture of my mail is now beginning to emerge. I am pleased to have received a number of favourable comments from readers and also a few questions about the content which I will try to answer here. Whilst I have attempted to balance the content of the column between civil and military, it is worth mentioning that for that nine month period my post has been biased by about 4 or 5 to 1 in favour of u.h.f./military communications!

Having made this distinction in my post, I think it is worth making a few comments to identify the reasons for this. If you look at it logically, there will always be a differential of information between the two disciplines of airband listening. Within the civil airband, a fair percentage of the frequency information is available in the public domain with just a few subjects such as discrete company frequencies being available for the listener to search for.

There are only around 900 civil v.h.f. airband allocations in the UK compared with about 2500 (identified) u.h.f. military allocations, so in theory, there will always be a larger percentage of new information. With military airband listening, searching the u.h.f. band, for example during an exercise, provides the thrill of the chase and there is a particular satisfaction to be gained by searching the 225-400MHz band and to pick up one or more new frequencies. With such a high percentage of discrete frequencies compared to the civil airband, the amount of newly discovered or amended u.h.f. information is always in theory going to produce much more correspondence for the column.

Apart from general listening, the main reason that I bought my first v.h.f. hand-held radio back in 1968 was to aid aircraft photography and that same principle still applies today. But as the radio world evolved, especially in 1984 with the introduction of u.h.f. capable radios, a whole new world of photographic opportunities opened up and the search for discrete u.h.f. frequencies started.

I remember standing under the approach to Runway 24 at Lakenheath with my newly acquired AOR AR2001, awaiting the return of some Ramstein F-4Es, (I dug out my log-book, they were CASH 51 and 52). A Swedish Air Force C-130 on a test flight out of Cambridge called up Lakenheath asking for two overshoots at Mildenhall, this was approved and consequently after a swift five miles down the back roads, I arrived at the approach to Runway 29 just in time for some photos.

The arrival of u.h.f. airband radios had immediately widened my photographic horizons, but as I stated earlier and equally as important, it opened up the u.h.f. airband and the facility to search for discrete frequencies.

Frequency Info

As expected, the introduction of the new LACC at Swanwick produced no frequency changes. The only thing that did happen was that the number of

London Control standby frequencies was reduced from 7 to 5 and they were rationalised. Instead of being allocated to specific sectors, they are now allocated to areas. The revised standby frequencies is as follows: Standby North 126.875, Standby East 133.525, Standby South 136.6, Standby West 127.7 and Standby Central 120.025. Two previous standby frequencies were withdrawn, they were 134.425 and 135.25.

In late March, Manchester Centre changed two of their frequencies: 124.2 became 134.425, (the ex London standby mentioned above) and 126.65 became 135.4. Lastly, Kinloss has a new v.h.f. Radar Talkdown frequency of 118.35.

Black Projects

As the last couple of months have been fairly quiet for 'Sky High' mail, I thought I would take some time out to address a subject that has appeared in 'QSL'. The letter from Paul Burns in the November 2001 *Short Wave Magazine* regarding strange sightings in Cumbria, has prompted several pieces of correspondence from readers. For a variety of reasons, it has been a long time since I have mentioned this subject in the column, so I thought we would air some of my thoughts and include those of other readers' views as well.

Now firstly, by Black Projects I do not intend to go down the path of Roswell, back engineering, space ships, etc. Unfortunately, the term UFO has been distorted over the years to immediately bring to mind flying saucers and aliens. This perception has no doubt been encouraged by the many varied sci-fi productions of the film and TV industry, but in truth, a UFO is just that, an Unidentified Flying Object. If you see an aircraft high overhead with a condensation trail and the sun reflecting from it so that you cannot identify the type, it is a UFO. On that basis, you could say that most aircraft radio enthusiasts have seen a UFO, possibly many!

Now the true Black Projects are a different thing altogether! Since the 2nd World War, primarily the Americans have spent a lot of time and money developing covert projects and testing them in the more remote areas of the South Western deserts of the USA. After much research by the US in the fifties, the two big names of the early years were obviously the U-2 and the SR-71. You would have expected both aircraft to be kept under wraps for some time, but the existence of the U-2 was soon known to most of the world just five years after its first flight.

U-2B 56-6693 was shot down by the Russians in May 1960 for supposedly infringing their airspace, (in fact I think from the Americans reaction it was definitely infringing their airspace). The civilian pilot, Gary Powers, reported that he was on a meteorological flight taking pictures of cloud formations, (allegedly!).

The predecessors to the SR-71, the A-11 and the YF-12, had only been flying for a couple of years

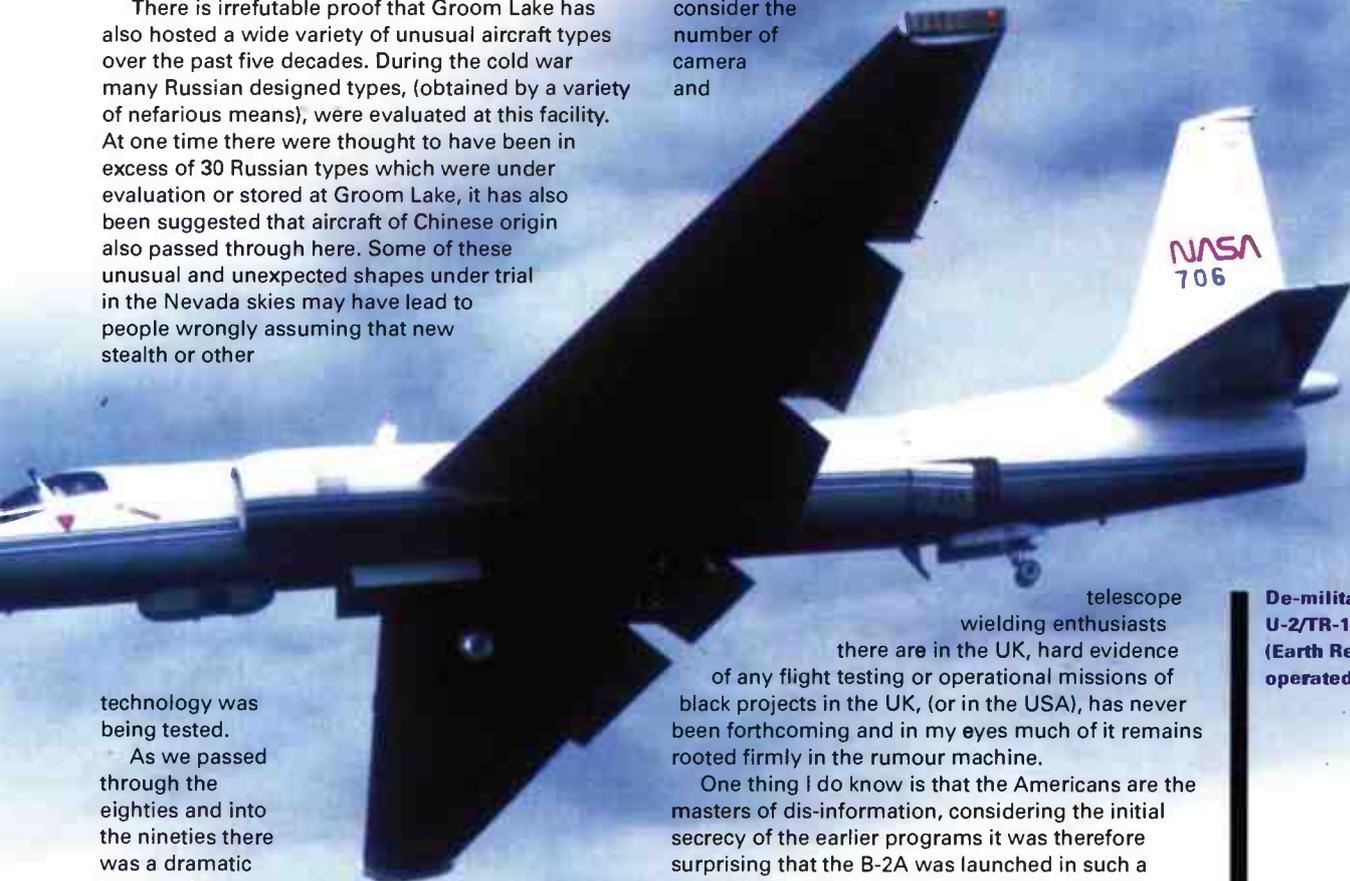
before the US President announced the existence of the SR-71 program in 1964 the same year that it first flew. So although people tend to think of these aircraft being secret for years, their existence was in fact made public quite early in their history.

Throughout the seventies and eighties these aircraft maintained a fairly high profile with the SR-71 even breaking the Trans-Atlantic speed record. The development programmes for the U-2, SR-71 and later the F-117A Stealth were largely conducted from the desert facility at Groom Lake in Nevada, also known as Area 51 or Dreamland.

There is irrefutable proof that Groom Lake has also hosted a wide variety of unusual aircraft types over the past five decades. During the cold war many Russian designed types, (obtained by a variety of nefarious means), were evaluated at this facility. At one time there were thought to have been in excess of 30 Russian types which were under evaluation or stored at Groom Lake, it has also been suggested that aircraft of Chinese origin also passed through here. Some of these unusual and unexpected shapes under trial in the Nevada skies may have lead to people wrongly assuming that new stealth or other

least half a mile either side of the approach path. It was also noted that many lights were turned out on the airfield.

About 10 minutes later, a single aircraft was heard to land with what some described as unusual sounding engines - it was not identified. Now this is the sort of incident from which great rumours begin, it is entirely in human nature to prefer to believe that this was the arrival of the latest black aircraft rather than the much more likely scenario that it was a base aircraft returning with its under-wing ordinance hung up - we will probably never know. When you consider the number of camera and



technology was being tested.

As we passed through the eighties and into the nineties there was a dramatic increase in

rumours of further Black Projects being developed and possibly being flown from the UK, some even suggested new aircraft designators such as the F-19 and the TR-3. On both sides of the Atlantic, sightings of strange black triangular aircraft became almost commonplace, new odd sounding power-plants that were possibly hypersonic engines were heard and unusual condensation trails were noted that further lead to the speculation of a new propulsion system.

On more than one occasion it was suggested that the former RAF airfield at Machrihanish, (now Cambletown), was host to covert aircraft on deployment, in particular F-117A being test flown by RAF pilots. As far as I am aware, there is no proof of this story. Boscombe Down was also reported to be hosting unusual types flying at night and I lost track of the number of stories regarding the SR-71 coming back in service.

Perhaps one of the most reported stories happened one Autumn evening in the late eighties. It was dark and a few enthusiasts were watching the full afterburner departures from Runway 24. The Police arrived suddenly and moved everyone on, they then closed the road under the approach for at

telescope wielding enthusiasts there are in the UK, hard evidence of any flight testing or operational missions of black projects in the UK, (or in the USA), has never been forthcoming and in my eyes much of it remains rooted firmly in the rumour machine.

One thing I do know is that the Americans are the masters of dis-information, considering the initial secrecy of the earlier programs it was therefore surprising that the B-2A was launched in such a blaze of publicity. The question that needs to be asked is **why** go public so early in its career and what else was its enormous funding being used for? Over five years ago, I put forward the view that the B-2A project is possibly an elaborate front, both politically and financially, for the real stealth or black project, that is as yet still hidden deep in the Nevada desert, five years on we are still none the wiser and speculation still continues.

Giving their past record, I think you would be very short-sighted to think that the Americans do not have several undisclosed projects under test and possibly even available operationally. As they say - "the truth is out there" - it just depends on when those in the echelons of power decide to tell it to us!

With the airshow season now with us (sadly without Mildenhall), I hope you will all be sending me in your frequency and callsign reports from your travels from around the UK. Also if you travel to other events such as deployments or exercises, don't forget to drop me a line.

Having by co-incidence included a picture of the SR-71 last month, to accompany this month's comments about Black Projects, I thought I would include a rare picture of the de-militarised U-2/TR-1, the ER-2, (Earth Research 2), operated by NASA.

De-militarised U-2/TR-1, the ER-2, (Earth Research 2), operated by NASA

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Scanning Scene

Did anyone read the note in the RSGB newsletter *RadCom* April edition? An amateur radio operator in Somerset, England, was transmitting on the amateur TV calling channel (voice) on 144.750 f.m. He was called by another amateur station in Dundee, Scotland. They had a natter and after a while it was apparent that the station in Scotland was transmitting on 434.850 f.m. and that the two stations were operating through a repeater! 434.850 is the output frequency of GB3DD the u.h.f. repeater in that area and that would explain why the frequency was being monitored. The chap in Somerset tried transmitting on 434.850 and heard his signal being re-transmitted on 144.750. He says in the *RadCom* that this lasted for around 24 hours intermittently. He states that v.h.f. and u.h.f. conditions were excellent at the time.

Firstly, this event prompts the obvious question as to who had installed such a cross-band repeater and secondly, what kind of repeater was it. It must have been one heck of a machine because, as you know, there is a whole lot of territory between Dundee and Somerset. Where was the thing?

As you can imagine, I've tried transmitting on these two frequencies with as much luck as I have with the lottery each week. It certainly reinforces the point that the amateur bands are well worth monitoring. There must be a rake of people and organisations that have purchased amateur equipment for other purposes and just are not bothered one little bit about the fact that they could be operating illegally. Of course some of the authorities can operate where they like. Could this have been some sort of temporary official link, or was it a clandestine repeater?

I have often heard many different non amateur users in the v.h.f. and

u.h.f. amateur bands. Some are permitted users and others are illegals. One marine radio dealer in Scotland was knocking out 'go anywhere' v.h.f. sets to fishing boats and these guys did just that...they transmitted just wherever they wanted. One day all may become clear, but in the meantime, if anyone has any information of what kind of monster repeater was heard in Somerset and Dundee, please share the information.

Frequency Monitored

A correspondent from Swansea, who asks not to be named, picked up on the mention, in April *SWM*, of the frequency 173.0625 being used by private surveillance operatives.

He was monitoring this frequency on the 25th November last year in the Upper Neath Valley and Forest areas of West Glamorgan where the Network Q Rally was in full swing. 173.0625 f.m. was being used simplex as a rally stage control frequency. The writer clearly is an accomplished radio operator as he also identified a number of other frequencies in use in connection with the rally.

They are:-

129.9000	a.m.	Rally Medevac helicopter
169.3625	f.m.	St.John's Ambulance Ch. 1 Callsign HA
169.1625	f.m.	St.John's Ambulance Ch.4
169.0875	f.m.	Unidentified rally team
457.3625	f.m.	Television Control Unit talking to TV crews at the rally stages (Crew A, B and C)
457.3875	f.m.	Unidentified, but connected with the rally
457.4125	f.m.	Rally base control talking with various stages.
461.250	f.m.	Sky outside broadcast calling themselves 'Mission Control' in contact with 'Line Control'.

All these were simplex as far as can be ascertained.

It was very kind of the monitor to write with this information, which has provided up-to-date frequency details for us and which will, no doubt, be of great use to rally fans.

What Scanner?

Every so often I get an enquiry of the 'What scanner should I buy?' type. These are always awkward to answer as different people have varying requirements from the receivers in terms of what they are going to listen to, where they are going to use the radio and so on. The power of advertising is

demonstrable in that a few folks have contacted me and mentioned that it's been suggested to them that they need a Bearcat UBC780XLT scanner.

Mike Burgess wrote a first rate review on this radio in the *SWM* February 2002 issue, but it's a good time to reiterate that these radios, in addition to being a good scanner, will track the Motorola Trunked radio systems only. This means that they will track the systems of the USAF at Lakenheath and Mildenhall, Staffordshire Police and Fire services and, of course, the Metropolitan Police system. Most sets are sold for the latter service. They will not track anything else. Sorry 'bout that. Unless you have a need to track these radio schemes, a conventional scanner will usually do and will save you a few 'bob'.

Audio Clip

"Houston, *Atlantis*. Ready for MTS power down isolation"....."Uh, roger Houston we'll put that in work".

(At least that sounded like what he said, although it must be tough pressing buttons when you're pulling around four G.).

That seven second audio clip was all that I heard on the 8th of April

when I set up the Bearcat UBC900XLT and discone to record any signals that came my way from the spacecraft. The recorder fired up at 2205 and that was what was captured. The shuttle has even been heard by monitors using a hand-held scanner strapped on to an external antenna.

I have listened to several shuttles on their way up on 259.700 a.m. I understand that a couple of other frequencies are used for the spacewalks. These being 296.800 and 279.000, both a.m. I've not heard anything on these two frequencies, but I always try.

Most of the time the astronauts and the folks in mission control use satellite links, but on launch that's where they can be found.

As I am writing, the Israeli military are involved in stern disciplinary action in the West Bank area. It seems that some of their communications have been overheard in the UK.

You'd be right to assume that they don't converse in English, but they have been monitored in 34MHz. The most active frequency being 34.600MHz f.m. If conditions are right, it may be possible to be monitoring the region.

Shop On-Line

Thanks to the advent of the Internet, military radio equipment is becoming more available to the well healed on-line enthusiast. I have found a few



Internet shops flogging some very up-to-date military gear including a couple selling the current PRC 319 h.f. radios for vast amounts of dosh. I'm not going to give out the web addresses, as by searching for them you'll have more fun and find more interesting kit to view, but a lot of really quite modern gear is available.

Another mass of gear that seems always to be for sale is so called 'surveillance' equipment. Most of the kit that is advertised consists of an f.m. transmitter utilising a free running oscillator which transmits in the f.m. broadcast band. Some of this equipment is marketed as 'Professional' or 'Government' type kit. Don't be fooled. HM the Q's staff wouldn't be using anything that can be monitored by the kid down the street on a six quid tranny from the market. The only guarantee that you have regarding this type of stuff is that it is overpriced. Be that as it may, many folks buy it!

Every so often just run through the environs of the broadcast band with a receiver and be prepared to hear these so called 'bugs'. I have been surprised to find more than a few of these devices operating on housing estates and industrial areas.

I am now returning to hermit mode until next month.



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%

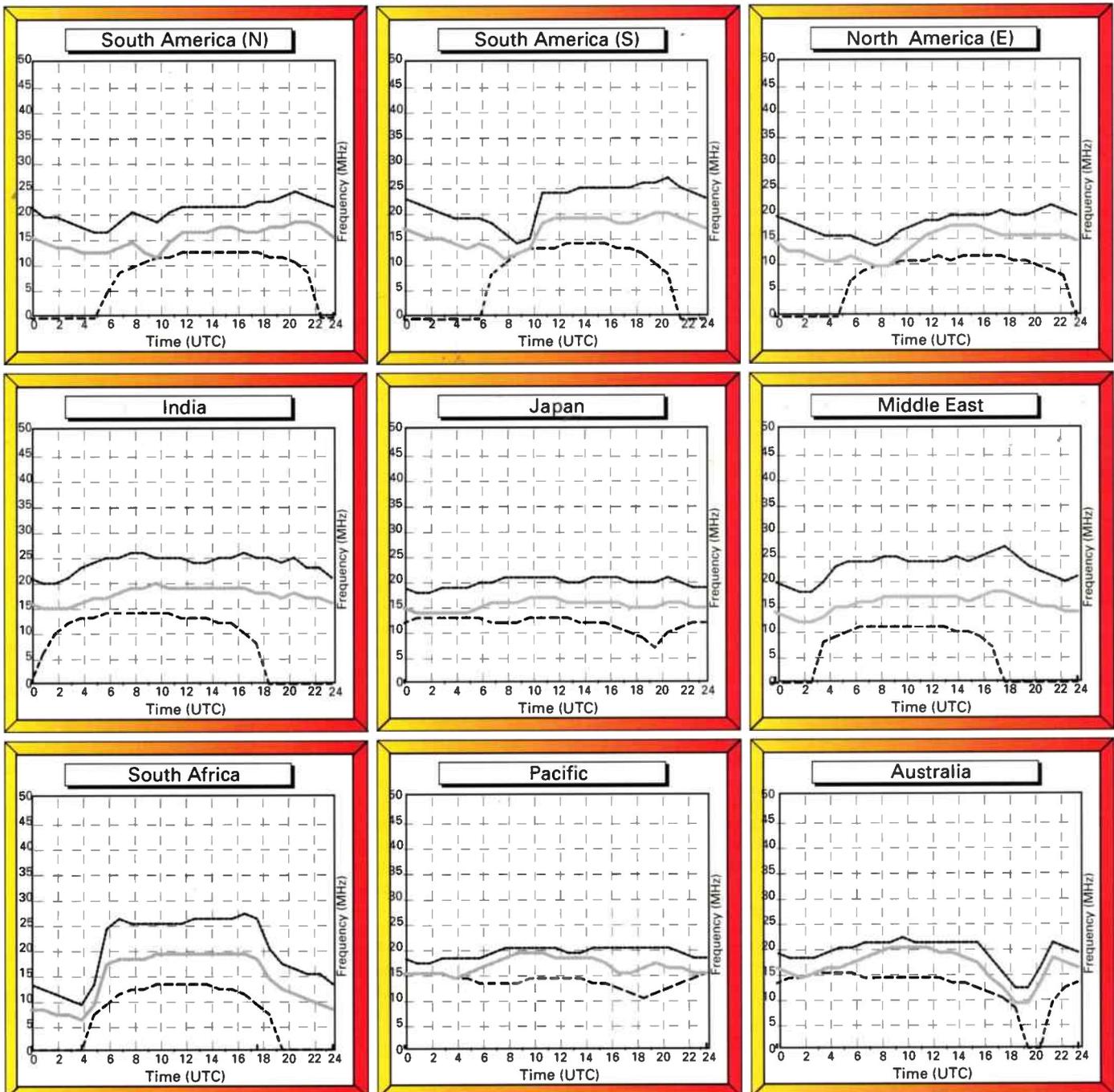
probability of success for the path and time.

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.

June 2002

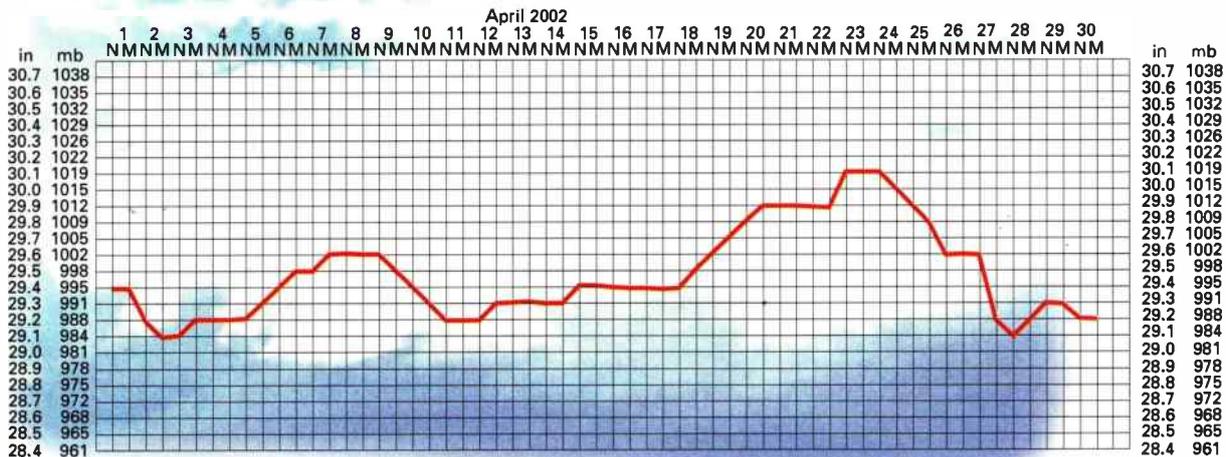
Circuits to London



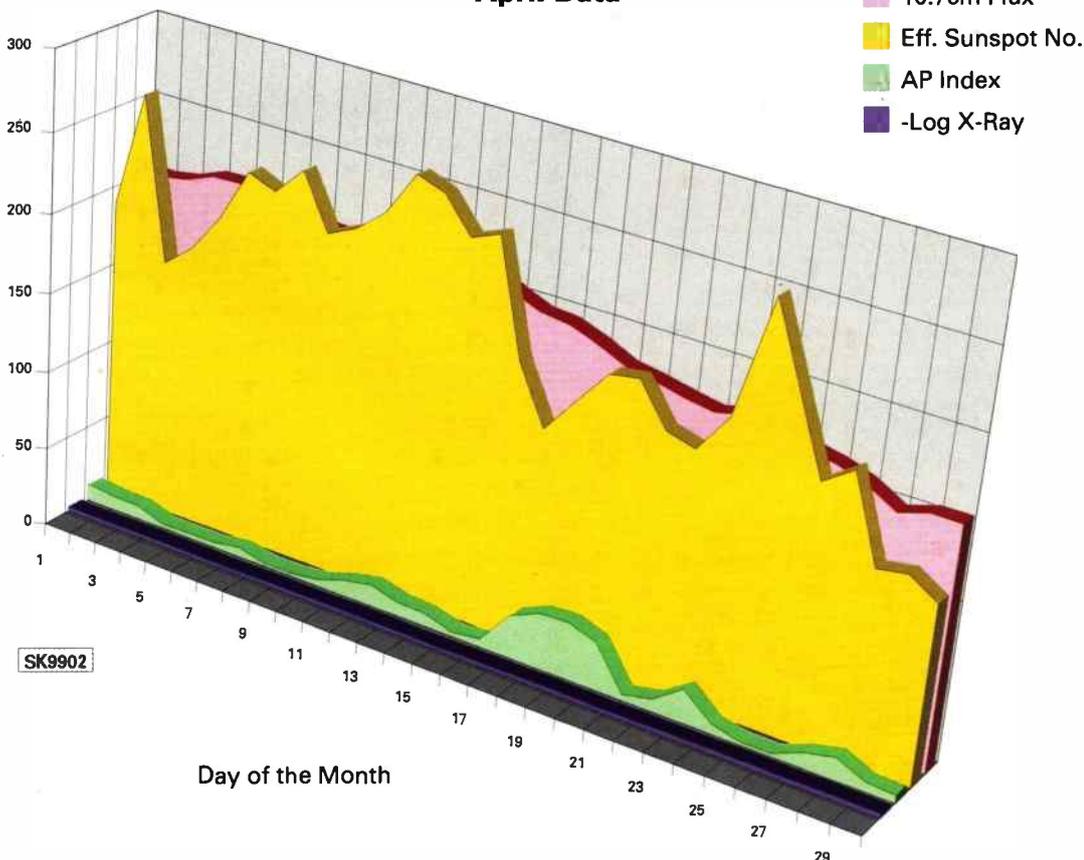
SK9901

Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, in the year 2002.



April 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.

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Amateur Bands

I thought that it was about time to look at this data mode, which, of the data modes which amateurs use, is probably closest to RTTY. But whilst RTTY, unfairly I know, conjures up images of noisy old teleprinters, PSK31 has a more modern image.

PSK31

Whilst it's relatively new to the scene, it won't win prizes for speed. In fact, it is pretty slow at about 50 characters a minute. The 31 relates to the baud rate (31.5 actually) which is slow by modern expectations. But a slow rate means a narrow bandwidth, which improves data detection under poor signal conditions.

The first software I tried was some freeware - PSK31 - written by Peter Martinez G3PLX. It was an absolute walk in the park to get going and use, a general feature of PSK software I found. Whilst monitoring transmissions, I noticed that most stations said that they were using *DigiPan* software, which is also freeware. So I downloaded that from the web. It's available on www.rtty.co.uk Although again I've only tried it on receive, the *Digipan* program is even easier to use. Apart from the obvious radio and computer, the only extra hardware needed for receiving is a cable from the headphone output of the radio to the line input of the computer's sound card.

A section of a QSO between GB2CG and IK3CST can be seen in Fig. 1. The coloured section below the text shows the audio spectrum being input to the software from the radio displayed as a 'waterfall'. The software will scan for PSK31 signals or the operator can select which part of the spectrum to monitor simply by clicking on it. It soon becomes easy to identify PSK signals from their visual signatures.

Most of the activity that I've found so far has been on 14MHz. One slight downside to the mode is that, because stations set up macros for most of their transmit text to save a lot of typing, there does tend to be a 'rubber stamp' style to most QSOs. There's plenty of stations using PSK31, and it's interesting to hear how weak a signal can be, and still be decoded. The centres of activity are around: 1.838, 3.580, 7.035, 10.142, 14.070, 18.100, 21.080, 24.920 and 28.120MHz. Listen on upper side band u.s.b. regardless of the band.

The February 2001 issue of *Practical Wireless* has a useful article about PSK31 by Robin Trebilcock GW3ZCF which is worth a read to find out more about the mode.

Happy Days

Back down to earth in Shropshire where **Philip Davies** picked up VP6DI on the new country of Ducie Island in the Pitcairns on 14 and 21MHz. He comments on the well mannered operating of the Pitcairn Islanders under the pressure from the thousands of stations in the pile-ups. As well as that new country, Phil bagged XROX of

the San Felix expedition off Chile's west coast which was reported in the March 'Amateur Bands' column. That new country for him was heard on 7, 14, and 18MHz. To make March a very successful month, Phil also heard 5W0IR (op VK2IR) on Western Samoa in central south Pacific on 14MHz. Three new DXCC countries for him in a month!

In Leicestershire **Alan Barker's** listening persistence also rewarded him with Ducie Island in mid March. He found VP6DI on the frequency of 21.295MHz as given in this column in March SWM. A very small sample of the other stations heard on Alan's NRD-345 with its 16m long wire antenna includes HL2DNN in Korea and T15S/P in Costa Rica on 18MHz. Also TM5C in Azerbaijan working K3P in Tanzania on 14MHz, as well as QRP (low power) station 3A2MY in Monaco and another Korean HL1ONF and T21PA on Tuvalu on 21MHz.

WHAT'S COMING UP

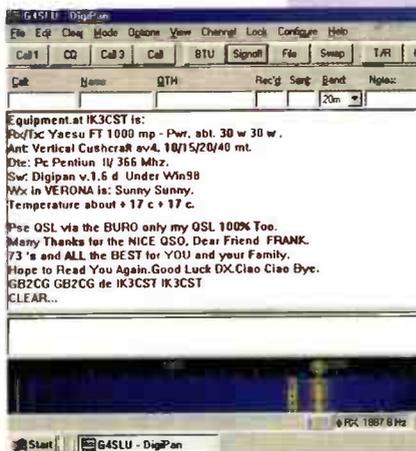
From the 15th June 2002, the 20th anniversary of the end of the Falklands conflict, **Les Hamilton GM3ITN** will be operating as VP8ITN from Saunders Island off West Falkland for a week. Les has had a long association with the Falklands of over 30 years, and maintained radio contact with the islands during the Argentinian occupation.

There's a couple of major UK contests coming up in June for your listening pleasure. The first is the RSGB (Radio Society of Great Britain) National Field Day which runs from 1500 on Saturday the 1st of June for 24 hours. This should bring lots of stations onto the air and will provide a good opportunity to compare the receiving capabilities of your station against those of the contestants.

The other contest of note is the Jubilee Contest which has also been organised by the RSGB and is to mark the 50 year reign of Queen Elizabeth II. It's another 24 hour contest and runs over the weekend following National Field Day Operation, the 8th and 9th of June. The start time is different from that contest at 1000. Don't forget we're in

British Summer Time, so the start times according to UK clocks are 4pm and 11am respectively. Right, I will now jump on my soap box and say that I think that it would be a good thing if the UK stayed on BST throughout the year.

Thanks for your logs and correspondence of your listening activities. Please address your letters to **Clive Hardy G4SLU, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW** or to clive@pwpublishing.ltd.uk If you write, a daytime 'phone number would be helpful.



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Info in Orbit

The anticipated launch of the next METEOSAT in 'mid-2002', together with the imminent launch of NOAA-M this June gives reason for optimism about the weather satellite (WXSAT) situation.

NOAA-M

At about 1824 on 24 June, NOAA-M (a polar-orbiting weather satellite to be re-named NOAA-17 once in orbit) should be launched by an Air Force Titan 2 rocket. The launch date has been changed several times due to higher priority mission requirements. From past experience we can expect early a.p.t. (low resolution images) and h.r.p.t. (high resolution) data. During the first two weeks, the infra-red sensors will be allowed to 'outgas' into the coldness of space. During this time, the a.p.t. channels are 1 and 2 (visible-light). When the infra-red sensors are ready, they will be activated and the standard infra-red/visible-light side-by-side channel transmission will commence.

METEOSAT Second Generation (MSG-1)

Most indications are that MSG-1, the first of the second generation of METEOSAT geostationary WXSATs, will be launched around the middle of the year. At least this seems to be the official line, and hopefully correct. I said 'most' because the Spaceflight Now - Tracking Station:

<http://www.spaceflightnow.com/tracking/index.html> site lists various Ariane flights (the MSG launcher), including those for INTELSAT-905 (second quarter) and INTELSAT-906 (third quarter), but no mention is made of the launch of MSG-1.

Three satellites (MSG-1 to MSG-3) are to be commissioned and will be launched by Arianspace. The spacecraft is compatible with the Ariane-4 and Ariane-5 launch vehicles. The launch of the first satellite, MSG-1, is 'foreseen' in mid-2002. The second will be launched about 18 months later to provide a two-satellite operational system. The third will be launched about four years after the second, or when it is needed, to maintain a continuous service for at least 12 years.

Stop Press

The target launch date of MSG-1 of 13 August 2002 has been agreed. This followed specific activities conducted between EUMETSAT, ARIANSPACE and ESA and the satellite Prime Contractor, leading to a solution of the shock problem for MSG on Ariane-5 via implementation of suitable shock attenuation devices. Full details in next month's 'info'.

User Stations

The current METEOSAT WXSAT transmits a low and high resolution data stream (called WEFAX -

see Fig. 6 - and PDUS respectively). The two main image formats from MSG-1 are Low Rate Information Transmission (LRIT) and High Rate Information Transmission (HRIT). HRIT will carry the full volume of processed image data in compressed and encrypted form. LRIT will carry a reduced set of processed image data and other meteorological data in compressed and encrypted form. After studying the anticipated transmission schedule for LRIT imagery, I am certain that many WXSAT hobbyists are going to want access to the transmission.

Transmission Schedules

Although these have been drawn up, the final 'operational' dissemination schedules expected to be in force at the start of the operational phase of MSG-1 can only be established during the commissioning of MSG-1. They have to account for the (as yet unknown) actual characteristics of the SEVIRI (Spinning Enhanced Visible and Infra-red Imager) system, particularly with regard to its image compressibility. Hence, the final operational schedules might differ from the current baseline.

LRIT Schedule Summary

The main transmission formats for LRIT data (consider this to be a vastly upgraded version of WEFAX) are the compressed (and lossy) versions of five of the 12 channels transmitted in the HRIT stream.

Table 1 shows the five 'native' channels scheduled for transmission. They include visible-light channel vis 0.6, NIR 1.6, IR 3.9, IR 6.2 (wv) and IR 10.8.

These represent a visible-light (equivalent to NOAA) channel, two infra-red channels also comparable with NOAA AVHRR, the METEOSAT-7 water vapour channel, and another NOAA AVHRR infra-red channel. Each channel will be transmitted in lossy format at 30 minute intervals, and within 15 minutes of collection.

As with current WEFAX, the new MSG data streams will include non-MSG images. The Foreign Satellite Data (FSD) sequence comprises images from GOES-E (the geostationary WXSAT positioned off the east coast of the USA), GOES-W (the other American WXSAT, positioned over the western coast of the USA), three channels from GOMS (the Russian spacecraft, when operational) including one visible and two infra-red channels, GMS/MT, the Japanese WXSATs of which



Fig. 1: NOAA-M spacecraft in 'clean room' prior to launch.

LRIT DISSEMINATION BASELINE				
		Product Repeat Cycle	Timeliness	Compression Type
SEVIRI 1.5	VIS 0.6 (I)	30'	15'	lossy
	NIR 1.6	30'	15'	lossy
	IR 3.9	30'	15'	lossy
	IR 6.2 (WV)	30'	15'	lossy
	IR 10.8	30'	15'	lossy

Table 1: LRIT SEVIRI channels.

FSD		180'	180'	lossless
	GOES-E VIS 0.55 (I)	180'	180'	lossless
	GOES-E IR 6.5	180'	180'	lossless
	GOES-E IR 10.2	180'	180'	lossless
	GOES-W VIS 0.55 (I)	180'	180'	lossless
	GOES-W IR 6.5	180'	180'	lossless
	GOES-W IR 10.2	180'	180'	lossless
	GOMS VIS 0.5 (I)	180'	180'	lossless
	GOMS IR 6.0	180'	180'	lossless
	GOMS IR 10.8	180'	180'	lossless
	GMS/MT SAT: VIS 0.5 (I)	180'	180'	lossless
	GMS/MT SAT: IR 6.5	180'	180'	lossless
	GMS/MT SAT: IR 10.5	180'	180'	lossless
	Polar SC data: VIS 0.6 (I)	2, 3	180'	lossless
	Polar SC data: IR 3.8	2, 3	180'	lossless
	Polar SC data: IR 10.8	2, 3	180'	lossless

Table 2: LRIT Foreign Satellite Data.



Fig. 2: NOAA-M Titan II launch vehicle.

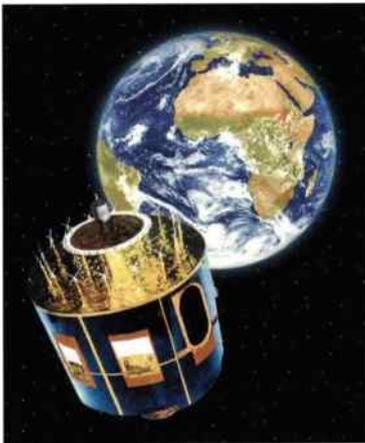


Fig. 3: *MSG-1* artist impression. (Picture courtesy Madeleine Pooley of EUMETSAT).



Fig. 4: *MSG-1* spacecraft. (Picture courtesy Madeleine Pooley of EUMETSAT).



Fig. 5: *MSG-1* in clean room - courtesy European Space Agency.



Fig. 6: WEFAX C2D *METEOSAT-7* image of Europe on 13 April.

MT will be the new digital WXSAT, originally expected to be the first in operation.

Finally, as with the GOES WXSATs, LRIT is expected to include three images from the polar orbiting WXSATs. All of the FSD transmissions will be lossless. Frankly, I can only hope that at least one of the UK suppliers of LRIT reception equipment (see later) can

develop an efficient system within a price that is reachable!

METEOSAT-7 provides *GOES-E*, *GOES-W* and GMS data in both WEFAX and HRI dissemination. *MSG-1* will continue the service in the LRIT/HRIT dissemination service, and aims at an expansion of the current service to meet the requirement of the Global Observing System (GOS) to provide near global data coverage several times a day. For completeness, **Table 3** shows the other meteorological products that are under consideration for inclusion in the schedule.

Hardware Requirements

To help potential users understand reception requirements for both data streams, EUMETSAT has issued documentation on the hardware

(and software) that users are expected to employ for normal (direct from satellite) reception. The most conspicuous parts of the systems are, of course, the dishes, and this was the section that I first studied. As was already known, dish size specifications are larger for *MSG-1* reception than for *METEOSAT-7*. The low rate data (LRIT) currently specifies 1.8m, and HRIT specifies 3.7m.

For a simple comparison, my PDUS dish (until recently, used to receive regular *METEOSAT-7* Primary Data) is 1.8m diameter, so in principle, this could be re-used. I doubt whether even the most sympathetic local Council would grant planning permission for a 3.7m dish, and except in the most protected environments, I would not feel happy about having such a large dish on my property - the threat of wind gusts occasionally reaching storm force would give me nightmares!

After the dish, the official specification lists a low-noise pre-amplifier (LNA) as part of a down-converter unit. The specification refers to the LNA used in their design - the Miteq AFM-2F-015018-04-10P - 'which has a remarkably low noise figure of 0.35dB and a gain of 30dB'. Looking at the specification of the pre-amp supplied with my Timestep h.r.p.t. system, I noticed that the specification given was a 35dB gain and less than 0.5dB noise figure,

Table 3: LRIT other data.

Met. Products	MPF AMV L, M, H	180°	45°	NOBBSS
(Three binary images)				
MPF CTH		180°	60°	NOBBSS
MPF CAl (Images)		180°	90°	N/A
DCP		N/A	10°	N/A
Duties from OTS				
		N/A	1	N/A
System Messages				
		2 h / 8 h	1	N/A
CANDIDATE LIST OF Optional Products (TBC / TBD)				
Met. Products	MPF Global Instability			N/A
	MPF Cloud Mask			N/A
	MPF AMV			N/A
	MPF Totale Ozone			N/A

suggesting to me that Timestep may be already in the 'ball park' for an *MSG-1* reception unit. Any comments Dave?

Eumetsat's User Station description adds the following: "The remaining

electronics (i.f. amplifier, remote monitor and so on) are based on a previous design, using industrial quality components and construction techniques. Similar designs have been used in the past for PDUS and NOAA h.r.p.t. reception in all climates, ranging from the Antarctic (-40°C) to Africa (+50°C) and have proven to be effective and reliable".

UK Suppliers

I have obtained contact details for four UK suppliers who have notified EUMETSAT of their interest in supplying/manufacturing *METEOSAT* Second Generation (MSG) High Rate User Stations (HRUS) and Low Rate User Stations (LRUS). They are shown in alphabetical order:

1) Bradford University Remote Sensing Ltd., Dr. John Stephenson of Byril Barn, Wilsill, Nr. Pateley Bridge, Harrogate HG3 5EA: john@burs.demon.co.uk

2) Dartcom Systems, Powder Mills. Postbridge, Yelverton, Devon PL20 6SP: David Wright dave@dartcom.co.uk

3) Thorn Satcom Data Services, Unit 4A Beechwood, Chineham Business Park, Basingstoke, Hampshire RG24 8WA: Kevin Muncey or Martin Green, kevin@thornsds.co.uk

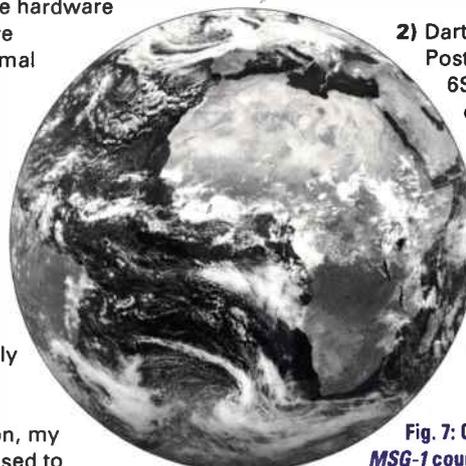


Fig. 7: Channel 1 simulated image from *MSG-1* courtesy EUMETSAT.

4) Timestep Weather Systems, PO Box 2001, Dartmouth TQ6 9QN: David Cawley, information@time-step.com

Prior to the launch and commissioning of *MSG-1*, I shall endeavour to obtain details from each company concerning the expected availability and pricing of its systems, and will bring you the information as it becomes known.

POES Launch Schedule

America's NOAA (National Oceanographic and Atmospheric Administration) has an ongoing launch program of Polar Orbiting Environmental Satellites that, following discussions and agreement with EUMETSAT, now incorporates Europe's METOP polar spacecraft as the

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- ICF-SW7600GR Dig WB receiver.....£130
- ICF-SW77.....£350
- ICF-SW35 Dig WB receiver.....£70
- ICF-SW12 11 band analogue receiver...£60
- ICF-SW11 12 band analogue receiver...£40
- AN-71 Wire antenna.....£8
- AN-100A Active antenna for ICF-SW100 and 7600G.....£50
- AN-1 Outdoor active antenna.....£65
- AN-LP1 Active loop antenna.....£65

HITACHI

- WORLDSPACE KHWS1.....£140

SANYO

- WORLDSPACE WS1000B.....£140

GRUNDIG

- SATELLITE 800EU.....£540

ROBERTS

- R862 12 band analogue receiver.....£25
- R871 15 band analogue receiver.....£35
- R9921 MB Dig WB Radio with RDS.....£60
- R881 Multiband digital world band radio ...£70
- R9914 MB Dig WB Rad with SSB.....£85
- R876 Multiband digital world band radio ..£115
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- RC828 MB Dig WB radio with cassette & time-recording.....£170

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- ENDEL EUROWAVE PMR446.....£55
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 £210**

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- ETREX.....£120
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- ETREX LEGEND.....£225
- ETREX SUMMIT.....£200
- ETREX VISTA.....£310
- ETREX GPS II +.....£200
- ETREX GPS III +.....£330
- ETREX GPS V.....£400
- ETREX GPS 12.....£130
- ETREX GPS 12XL.....£200
- ETREX GPS 12CX.....£235
- ETREX GPS 76 Marine.....£190
- ETREX GPS MAP76 Marine with MAP.....£310
- STREET PILOT COLOUR III.....£750

YUPITERU

- MVT-9000 MKII ALL MODE.....£160
- MVT-7300 EX ALL MODE.....£250
- MVT-7100 EU ALL MODE.....£195
- MVT-3300 EU.....£135

YEASU

- VR-120 100KHz-1300MHz.....£160
- VR-500 100KHz-1300MHz with AM FM WFM LSB USB.....£209
- VR-5000 100KHz-2599MHz.....£630
- FT817 Inc PSU & Rechargeable battery £670
- FT847.....£1200

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- AR5000 + 3.....£1500
- AR7030.....£670
- AR7030 PLUS.....£800
- AR5000.....£1340
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World Radio History

'morning' satellites, with NOAA spacecraft as the 'afternoon' satellites for the future, beginning in 2005.

NOAA-M launch in June 2002 (imminent) into a 'morning' orbit.

NOAA-N launch in June 2004 into an 'afternoon' orbit.

METOP-1 launch in December 2005 into a 'morning' orbit.

NOAA-N' launch in March 2008 into an 'afternoon' orbit.

Follow-on convergence - 2007-2008

NPOESS (am and pm) January 2009

METOP-2 launch 2010 (am orbit).

The period 2007 - 2008 is currently scheduled for the convergence of America's civilian (NOAA) and military (Defense Meteorological Satellite Program - DMSP) constellations.

Correspondence

Clive Finnis wrote from Mudeford in Dorset shortly after *METEOR 3-5* was re-activated. "I was very pleased today to receive a view of the entrance to the St. Lawrence Seaway with Newfoundland and Labrador clearly visible. This is definitely my 'furthest East' pass ever and shows the extra range that can be achieved with Meteor's higher altitude compared to the NOAA satellites". There are occasional reports of poor image quality from *METEOR 3-5*, and the line jitter is seen in Clive's image, but I am sure that hobbyists would rather have the spacecraft operating than not. Clive uses his **Paul Hayes** QFH (antenna) mounted in the loft, with a RIG (Remote Imaging Group) home-boxed pre-amp and a Timestep receiver and decoder.

The saga of **Kevin Hughes'** interference (on v.h.f. a.p.t. transmissions) continued in April. Kevin contacted the Radiocommunications Agency whilst trying to locate the source of interference to his WXSAT monitoring. He had gone to extra-ordinary lengths to isolate potential sources (for example mains-borne), but without any success. He reports: "Two extremely pleasant and knowledgeable chaps came from the RA on Friday morning (5th April) and had a good old sniff around the area with some seriously nice kit - including a Marconi spectrum analyser and a Rohde & Schwarz mini post receiver. They hooked up to my QFH (v.h.f. WXSAT antenna) and set about searching for the culprit. Sadly, they heard nothing, as the sound is only clear when the satellites are coming and going; their visit was at 1150. They are now coming back to me on Tuesday morning at 0730UTC when there will be three decent passes - NOAA-12, -14 and -15 to listen to".

He added: "In the meantime, I hooked up my PCR1000 and set up the spectrum analyser function, starting at 137 and ending at 138MHz. To my amazement, I picked up the strong buzzing noise loud and clear from around 137.6 to 137.7 with no satellites present, and over a greater range than this when receiving a NOAA signal. I E-mailed my findings to the RA in the hope that it may point them in the right direction". Kevin may be interested to hear that other readers have

International Space Station - Shuttle Launch Schedule

STS-111 *Endeavour* is scheduled for launch on 31 May for the 14th ISS flight, carrying the Multi-Purpose Logistics Module Leonardo and for crew rotation. STS-107 is scheduled for launch on 17 July for a non-ISS mission.

expressed an interest in knowing the outcome of these investigations.

The Lesser-known Mission Objectives

METEOR 2-21 (the Russian WXSAT) was launched in 1993 - the twenty-first of twenty-seven in the *METEOR-2* series of Russian meteorological satellites. They were designed to monitor atmospheric and sea-surface temperatures, humidity, radiation, sea-ice conditions, snow-cover and clouds - but *METEOR 2-21* had a little extra.

What makes *METEOR 2-21* distinctive from other meteorological satellites in the series is its retro-reflector array - Fizeau - named after French physicist, **Armand Fizeau**. In 1851 he conducted an experiment which tested for the 'aether convection coefficient'. The accurate tracking of this satellite was used for precise orbit determination, including the 'Experiment of Fizeau'. This tests the special theory of relativity - that distant events that are simultaneous for one observer will not be simultaneous for an observer in motion relative to the first.

The retro-reflector array (RRA) on *METEOR 2-21* consists of three corner cubes in a linear array with the two outer corner cubes pointing at 45° angles relative to the central cube. This is made of fused silica and provides nearly equal intensities for compensated and uncompensated velocity aberration. Both outer reflectors have aluminium coating on the reflecting surfaces. Data from satellites *MOBLAS-4* and *MOBLAS-7* seem to confirm the presence of the compensating influence of the Fizeau effect, according to NASA.

RESURS-1, a Russian resources satellite launched in 1994, has two corner cubes reflectors with near diffraction-limited reflectors specifically designed for the continuation of this experiment. WESTPAC, a future satellite will verify indisputably the existence or otherwise of the Fizeau effect.

Frequencies

NOAA-12 & NOAA-15 transmit a.p.t. on 137.50MHz.

NOAA-14 transmits a.p.t. on 137.62MHz.

NOAA-16 has an unresolved fault with a.p.t.

NOAAs transmit beacon data on 137.77 or 136.77MHz.

METEOR 3-5 usually transmits on 137.30MHz when in sunlight.

OKEAN-4, *SICH-1* & *OKEAN-O* have used 137.40MHz for brief transmissions.

METEOSAT-7 (geostationary) uses 1691 and 1694.5MHz for WEFAX.

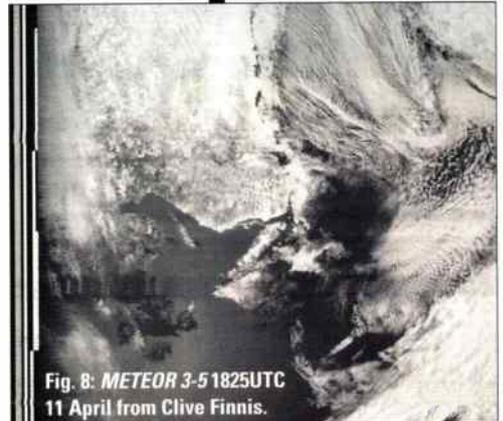


Fig. 8: *METEOR 3-5* 1825UTC
11 April from Clive Finnis.



Fig. 9: NOAA-15
7 April 0800UTC a.p.t.
from Kevin Hughes.

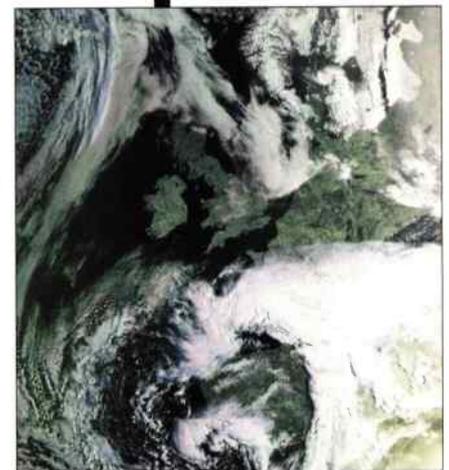


Fig. 10: NOAA-15 same pass,
h.r.p.t. received in
Southampton.

Attention-123!

Tuesday 9th April saw the end of **M23's** 579 schedule, mentioned in the last column as being the longest-running schedule of all time - it has at last ended. The 579 schedule had been operating twice daily since February 1997, without a single message ever being sent. Maybe it never intended to send a message (although M23 schedules usually do), if not, it would be informing somebody of a particular operational state, e.g. telling a 'sleeper' to carry on doing nothing, or telling an agent that it was safe to continue supplying information, etc. Often numbers stations carry on sending dummy 'messages' long after recipient has finished his/her assignment and returned safely back to their own country. The fact that this schedule ended when it did, doesn't necessarily mean that the 579 'no message ID' was valid right until then. Trying to tie up most numbers activity with known world events is usually quite futile. However, the mysterious short-lived British-operated **M5** appeared precisely over the short period of the Moscow coup some years ago, and disappeared just as suddenly. Any logs of M23's other schedules are particularly needed. Note that its uses long zeroes, unlike most Morse stations nowadays, and is a Western operation.

Talking of long-running schedules, the erratic **E17z** has been operating for many years, as far as I know, always using 274 as its SN. Originally, transmissions began at 0820, between 9.250 and 9.290MHz almost daily, group counts varied and null-message formats were occasionally sent (i.e. 274-00000). This schedule sometimes has periods of inactivity, after which it pops up at different times and on different frequencies. At present it operates quite regularly at 1400 on around 10.160MHz, repeating within seconds of ending on around 8.100MHz (last logged yesterday, Friday 12th April - using reduced carrier n.s.b.). For some years now the group count has been fixed at 50, and messages are *always* sent. In many ways, this Russian station doesn't follow the strict rules of Family I (although its format is identical), which has made us long suspect that it is operated by one of the former Soviet states. Its main peculiarity is its consistent use of the same 274 ID whatever schedule it happens to be running. As with so many numbers stations, its not worth setting your receiver to the expected frequency, for it may turn up a few or even tens of kHz higher or lower. This is why the habit of searching is so important. Synthesised receivers which tune, for example, in 1kHz steps are not really suitable for search purposes as stations (especially Morse) can easily be missed due partly to the audio 'plops' produced by tuning in discrete steps. Continuous tuning is recommended (or steps of 1 or 10Hz) and this is generally used professionally.

E17z mustn't be confused with **E17y**, a quite different operation, yet using the same female voice and same format. The latter, often reported from the USA, is operated by the Russians from Cuba, and its habits conform in every way to those of Family I. Incidentally, the Cubans (Family XVIII) are still very active, nearly every time I switch the radio on in the morning, I hear a V2 or an M8!

CSO and DF

'D' has written in from Buckinghamshire, a former employee of a 'certain government radio department'. He has a lot to say about monitoring and direction-finding

methods. On the numerous h.f. monitoring sites in this country, (run by the Composite Signals Organisation and the military) very few now exist - as there is far less h.f. activity than formerly. After the recent closure of Culmhead, the biggest are now probably CSOS Irton Moor (Yorks) and RAF Digby (Lincs). A major role of such stations is to monitor espionage communications, i.e. Numbers Stations and transmissions sent out by agents and 'illegals'. Originating in the wartime 'Y-Service', these monitoring sites linked by dedicated land-lines, are capable of obtaining approximate d.f. fixes on unidentified transmissions very quickly. However, the further the distance, the less accurate the fix. Once the approximate area of transmission has been found, mobile d.f. vehicles are sent out to find the precise location using the ground wave. The GPO, later MPT, later Home Office, late the DTI, later still the Radiocommunications Agency, whose main monitoring site is now based at Baldock, have long played a part in this. DF vehicles can be deployed from Baldock, and regionally, and in the GPO era, these were olive green Bedford vans bearing 3-element horizontal loaded Yagis on the roofs. They are kept in practice by d.f.ing land-based pirate stations, but their primary purpose has always been to serve GCHQ. The 100W transmitter of the Krogers was allegedly traced in this way - their transmissions were too long and too frequent. Further information from 'D' will appear in future articles.

A French government contact states categorically that **M16** is run by DGSE and not the French military, although its transmitters are at St. Assise, a military site. This is quite normal, even M16's 'Lincolnshire Poacher' is transmitted from a military site. The French military use legitimate French callsigns, such as FAV, FDC, etc., whereas M16 uses the bogus 'Indonesian' callsign 8BY for its hourly transmissions.

An unusual **G7** (Family II) transmission appeared on 15th March (1855z, 8.972MHz) sending a repeated count of 0-9 ending at 1901 with no message. Was this a test, or did it have greater significance? Nothing like this has ever been heard of in this family before. The Russian pip (**XT**) popped up on 7.606MHz one evening in February. Has anyone else heard it away from its usual haunts? **S17c** can still be heard daily at 1250z on 9.165/??MHz. CIA's **E5** appeared on *four* parallel frequencies on 10th March, instead of its usual two, was this an error? Does anyone know how long M14 has been operating its 494 schedule at 0800 on Wednesday mornings? This one is sent slower than its usual fast keying.

Enigma Booklet

We've had quite a large number of requests for our booklets and hope that these will help you understand more about the subject. An updated supplement is at present being compiled, but the originals are still available at £7.50 (for both, including postage, payable to ENIGMA). Readers may not be aware that some years ago, ENIGMA worked with Irdial Discs (PO Box 424, London SW3 5DY) to produce a quadruple CD of Numbers Stations. This may still be available, if not, and if there's sufficient demand, a cassette of Numbers Stations off-air recordings may help with identification. Please let us know if you'd like us to prepare one. Before we go, we'll remind you that ENIGMA 2000 can be contacted at <http://reachus.at/enigma> They produce a more in-depth newsletter than can be provided by one page of *SWM*.

IC-R10
IC-R2

We Do Things a Bit Differently Nowadays

These two terrific handportable receivers from Icom give portable power in your palm - hear everything - don't won't miss a thing whether your at home or in the field!

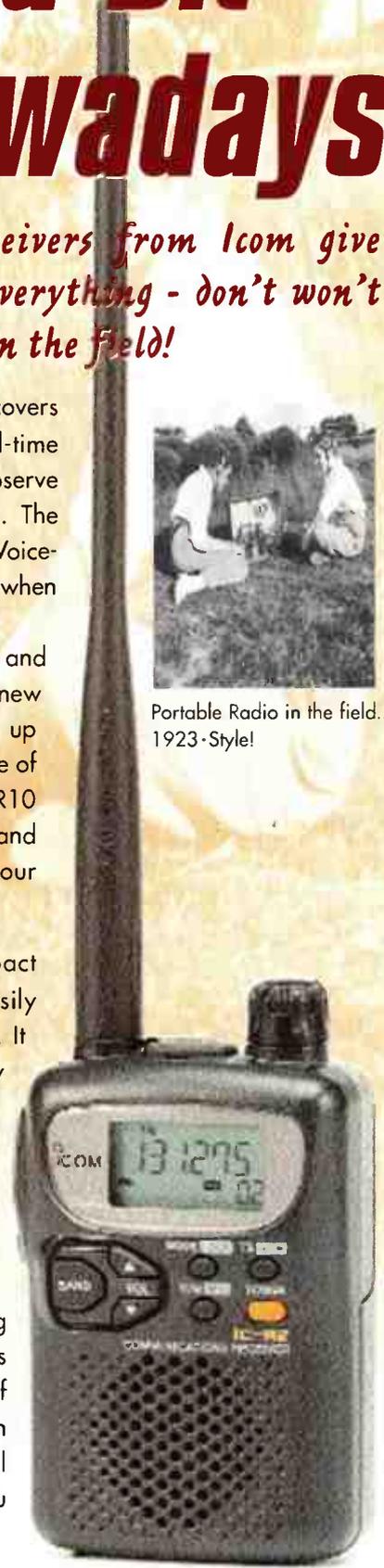
IC-R10 The ICOM IC-R10 handheld receiver covers 0.5MHz~1300MHz in all-modes and boasts a real-time bandscope function to find busy frequencies and observe receiving frequency band conditions. The scope passband width is selectable. Voice-scan function (VSC) pauses scan when modulated signals are received.

Other features include; Bank and memory functions plus new SIGNAVI function to speed up scanning and add to the range of scan modes. Optional CS-R10 P.C. software allows you to edit and load memory data from your computer.

IC-R2 The ultra-compact IC-R2's frequency range easily receives 0.495~1309.995MHz. It is economical to run with only 2 x AA (R6) alkaline or Ni-Cd batteries needed. It receives most AM, FM, TV sound broadcasting and public communications on the AM, FM and WFM modes. 400 memories store operating frequencies and tuning steps etc. There are also 25 pairs of channels to store program scan edges. Plus... the IC-R2 has all the user-friendly features you expect to find in an Icom.



Portable Radio in the field... 1923-Style!



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LW Maritime Radiobeacons

The streams of digital data radiated by some former beacon stations, which are differential corrections for use with the Global Positioning System (GPS), made searching the band at night for the sky waves from distant maritime radiobeacons quite difficult during January, February and March.

Owing to the 'interference' generated by these transmissions **Robert Connolly** (Kilkeel) found that 'large chunks' of the band were completely unusable for beacon DXing. During his regular monitoring sessions at night he tried using filters in an attempt to overcome the problems, but they proved to be ineffective.

By searching the least affected areas of the band, Robert managed to compile an interesting log. From a southerly direction he picked up the beacon at Carla Figuera, Majorca (FI) on **294.0**; Castellon, S.Spain (AS) on **285.5**; also five others along the coastline of Spain - see chart. No trace could be found of the beacon at Rota, SW.Spain (D) on **304.0** although he had been reliably informed that it had been received in the French Alps during daylight.

On two occasions, during favourable conditions, Robert picked up the beacon at Punta Del Penna, Italy (TL) on **314.5**. From further east he logged Klaipeda, Lithuania (KA) on **305.0** and Mys Taran, Baltic Russia (BT) on **312.5** but others were buried in the noise. From a northerly direction he heard three beacons on the Faeroe Is at Myggenaes (MY) **337.0**, Akraberg (AB) **381.0** and Nolso (NL) **404.0**. The Prins Christian Sund beacon (OZN) on **372.0**, located on the southern most tip of Greenland, was the most distant entry in his log.

The beacons on the Faeroe Is at Myggenaes (MY); Akraberg (AB) and Nolso (NL); also Prins Christian Sund, Greenland were also heard at night by **Fred Wilmshurst** in Northampton. Some along the coast of Spain also attracted his attention - Cabo Machicharo, NE.Spain (MA) was still operating on the original frequency of **284.5**, but Cabo Mayor Lt, N.Spain (MY) and Estaca de Bares, NW.Spain (BA) were on the re-allocated frequencies of **283.5** and **292.5** respectively. He was both surprised and delighted to hear for the first time the beacon at Castellon, S.Spain (AS) on **285.5**.

When searching for the beacons along the coast of Spain on their re-allocated frequencies (see page 70, December 2001 *SWM*) do bear in mind that there may be a delay of up to 55 seconds before their callsign is sent twice. By listening with extra care, **Fred Pallant** (Storrington) heard at night twice as many beacons as usual! In addition to logging Cabo Machicharo (MA) on **284.5**; Estaca Bares' (BA) **292.5**; also Cabo Finisterre (FI) **296.5**; all of which he had heard before, Fred picked up the sky waves from Cabo Mayor Lt, N.Spain (MY) on **283.5**; Llanes, NW.Spain (TA) **287.0**; also Cabo Penas, NW.Spain (PS) on **295.5**.

A few years ago **Jim Edwards** (Wigan) was a

Long Wave Maritime Radiobeacon Chart

Freq (kHz)	C/S	Station Name	Location	DXer
283.5	MY	Cabo Mayor Lt	N.Spain	A*,B*,C*,D*
284.5	MA	Cabo Machicharo	NE.Spain	A*,B*,C*,D*
285.5	AS	Castellon	Spain	A*,D*
287.0	IA	Llanes Lt	N.Spain	A*,C*
292.5	BA	Punta Estaca Bares	N.Spain	A*,B,C*,D*
294.0	FI	Caia Figuera	Majorca	A*
295.5	PS	Cabo Penas Lt	N.Spain	C*
296.5	FI	Cabo Finisterre Lt	N.W.Spain	A*,B*,C*
305.0	KA	Klaipeda Rear Lt	Lithuania	A*
312.5	BT	Mys Taran Lt	Russia	A*
314.5	TL	Punta D.Penna	Italy	A*
337.0	MY	Myggenaes	Faeroe Is	A*,D*
372.0	OZN	Prins Chris's Sund	Greenland	A*,D*
381.0	AB	Akraberg	Faeroe Is	A*,B*,D*
404.0	NL	Nolso	Faeroe Is	A*,B*,D*

Note:

Entries marked * were logged during darkness.

All other entries were logged during daylight or at dawn/dusk.

DXers:-

(A) Robert Connolly, Kilkeel.

(B) Jim Edwards, Wigan.

(C) Fred Pallant, Storrington.

(D) Fred Wilmshurst, Northampton.

regular contributor to this column, but his DXing activities ended when he moved to a block of flats. Reception indoors proved to be poor and he was not allowed to erect an outdoor antenna, so there was little hope of hearing distant l.w. radiobeacons. However, he recently obtained permission to fasten an outdoor antenna to the guttering - it is about 84m long running north/south. It is performing a great deal better than any of the various active antennas which he tried indoors. After a long gap, Jim is now able to enjoy searching the l.w. maritime radiobeacon band again and so far he has logged four along the coast of Spain and two on the Faeroe Is - see chart.

APPENDIX - List of equipment used:-

Robert Connolly, Kilkeel: JRC NRD-525 + Timewave DSP9+ filter + Datong AD-370 active antenna.

Jim Edwards, Wigan: JRC NRD-535 or Drake R8E + 84m wire or indoor active antennas.

Fred Pallant, Storrington: Trio R-2000 + Howes CTU-9 a.t.u. + random wire antenna.

Fred Wilmshurst, Northampton: Icom IC-R70 + Global AT-1000 a.t.u + random wire antenna in loft.

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Decode

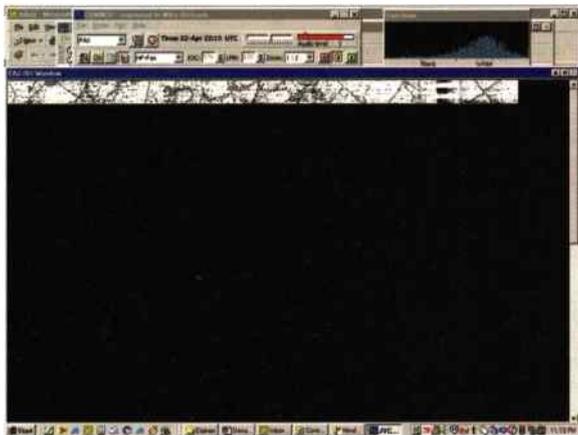


Fig. 1: JVFAX busy receiving a noisy signal.

Linux Decoding

I received an interesting letter from **John EI7IG** regarding his experiences decoding with a Linux based system and thought you might be interested to hear what he had to say. "I re-read your 'Decode' column of June 2001. I had a quick

look at *baudline*, it seems to be a very comprehensive tool. Anyway, I've returned to 'things radio' after a few years absence, I got my finger out over the last few weekends and got sound configured up on my machine, a Athlon 900MHz with a K7VZA Motherboard. I had to download and install the latest

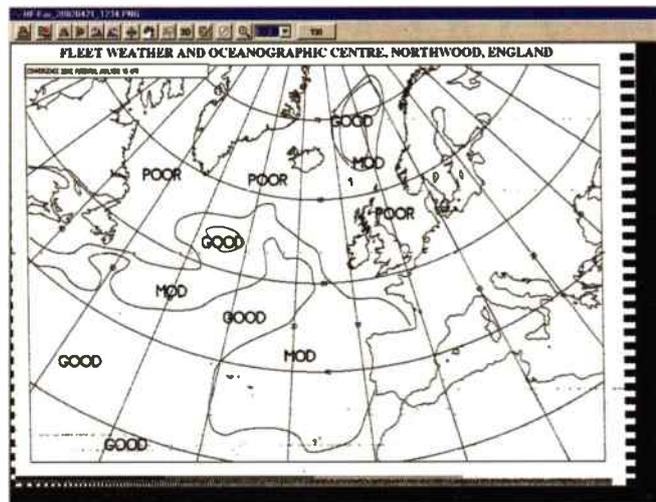


Fig. 4: Picture received with JVComm.

Quick Start

Here's a neat readers suggestion that I'm going to get running this month - a 'Quick Start' section. I will put together an idiots guide to getting started on a particular utility mode for free or minimal outlay. This will be designed specifically to help those readers who happen upon the column and want to try decoding but with minimal fuss. I'm sure it will also prove helpful to existing Decode readers who want to try a new mode. To keep the costs down I will, wherever possible, choose software that uses the sound card for input and comes either as freeware, shareware or in demo form so you can try for free. With a bit of luck all you will need is your PC, an Internet connection and a lead to connect from your receivers line/tape-out to the line-in on your sound card. In most cases, this will be a simple screened lead with a 3.5mm jack at each end. If you don't have an Internet connection, it shouldn't be too difficult these days to find someone who can download a file for you.

Let's get the section underway this month with FAX. I've chosen this for the first mode simply because its a generally very attractive mode because the results are usually good and you can impress your friends and family with the results.

To start with, the list of things you need for the mode - **Table 1**:

Now you need to follow this step by step process:

- 1) Download the software using the following link select the latest version of the program from the supplied list:
<http://www.pervisell.com/download/jvc32/> You will be prompted to choose a directory to save to file - make a note of this.

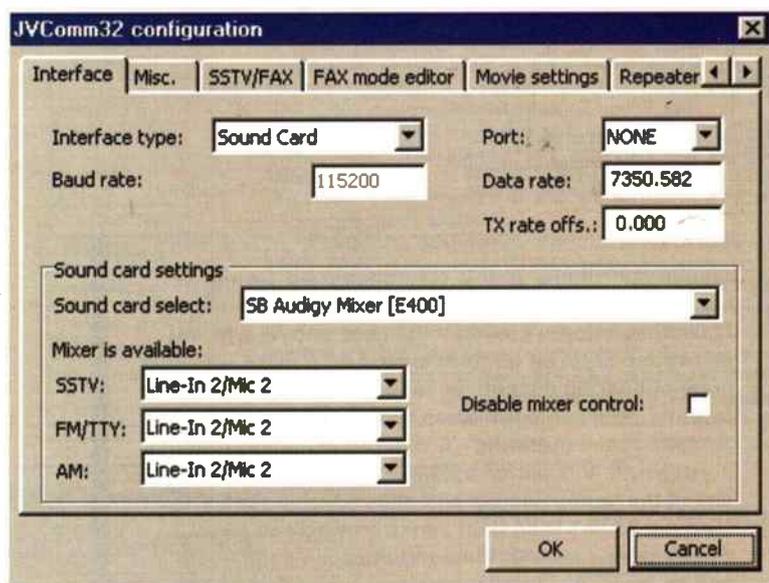


Fig. 2: JVComm configuration panel.

'stable' ALSA drivers. Once I had sound working, I took a quick look at *multimon*, *acfax* and *qsstv*. I found that *acfax* worked immediately, and I decoded a few weather FAXes from Northwood (and stored the frequencies in my radio), I tuned around 14MHz and grabbed a few SSTV transmissions with little or no effort using *qsstv*. Success with *multimon* which decoded 1200baud packet, and DTMF tones for me no problem. It was partially successful decoding pager transmissions, though not 100%. Of course *baudline* worked immediately. I've configured 'predict' to run on boot-up on my machine, so it displays to a spare terminal all the time in 'multitrack' mode. I can then run *gsat* to give me an 'X' display if I wish."



Fig. 3: JVComm's toolbox for picture correction.

Table 1

PC Requirements:	Pentium PC 100MHz or faster, 32MB RAM, 800 x 600 graphics, 16-bit sound card. <i>Windows, 95, 98 or NT4.</i> *
Computer to Radio Interface:	Audio lead.
Software:	JVComm32

* Note that very few decoding programs work with the later version of Windows. *Windows 98SE* is the most stable platform to use.

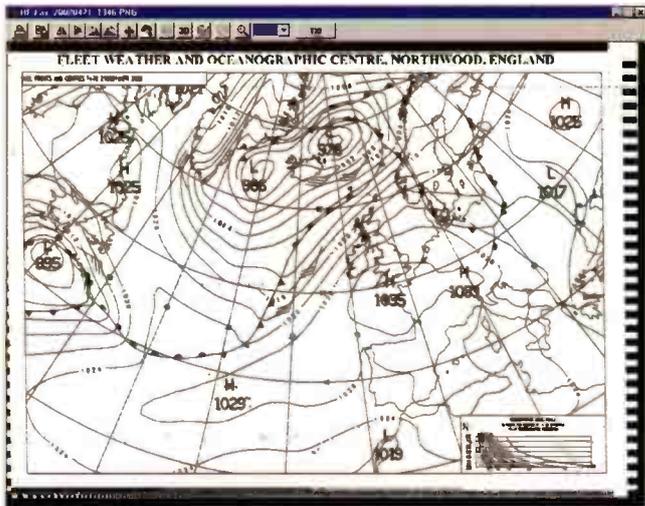


Fig. 5: Another *JVComm* FAX picture.

- 2) Install the software by double-clicking on the file you've just downloaded and follow the instructions.
- 3) Connect the 'line-out' or 'tape-out' of your receiver to the 'line-in' on your sound card.

- 4) Tune your receiver to 8.0381 or 7.8781MHz and set the receive mode to u.s.b.

Please note that the actual FAX frequencies are 8.04MHz (Northwood Fleet Weather) and 7.88MHz (Hamburg Met), but most receivers are set for voice operation so require a 1.9kHz tuning offset hence the modified frequencies.

- If you're not sure about the sound of a FAX signal, download the following audio file and you can take a listen:
<http://www.wunclub.com/sounds/wefax.wav>
- If you're monitoring Northwood (8.04MHz) note that the carrier is turned-off in between charts so just tune in and be patient.
- Both Northwood and Hamburg are really good strong signals, but they are often at their best in the early evening.

- 5) Use the Windows menu, START, Programs, *JVComm32* to run *JVComm32*.
- 6) With the program running press 'Alt C' (Alt and 'C' keys together) to bring up the configuration menu.
- 7) Click the Interface Tab and make sure the sound card and chosen input is selected.
- 8) When you hear a FAX signal running press the Right-Arrow play button to start reception you should see a picture start to build-up line-by-line. Don't worry if the edge is in the middle or if the picture has a slant at least you know your connections are correct and everything is basically working.
If you don't seem to be getting a signal through go back to the Configuration screen ('Alt C') and double check you have selected the right input. It this is correct choose Start Settings Control Panel and double click the Multimedia icon. Click Record and make sure the volume slider for the input you're using is around the mid-point. If this doesn't work you've probably got a problem with your connecting lead.
- 9) Assuming you're able to receive some sort of

picture you now need to sort-out the slant correction. The slant is caused by small timing errors in the PC and is easily corrected. First you need a decent chunk of received picture at least half a screen. When you have this you just click on the toolbox icon and then click the slant correction icon you will be presented with an explanatory box. Move your cursor away from the box and it will turn into a cross hair. Now click at the top of the image near its edge and drag a line following the slant of the picture. When you're comfortable that you've done this you can click the 'OK' box and the program will calculate, adjust and store the new timing values.

That's it - you now have a fully functioning FAX receive system in just nine simple steps. If you enjoy the mode, don't forget to register your *JVComm32*. Now you probably want to know where to go to find our more and seek out those rare pictures. One very useful Internet website that's dedicated to FAX reception is that of Marius Rensen. This excellent site that can be found at: <http://www.hffax.de/> Marius' site contains a huge range of information for FAX enthusiasts including frequency lists and schedules. Another excellent place to look is the World Utility Network, they live at: <http://www.wunclub.com>

HFDL Downloads

It appears several readers have had problems downloading Charles Brain's *PC-HFDL* decoder which I mentioned last month. If you're one of those readers sorry! Kevin the Editor however, tells me that there has been a massive number of successful downloads from the *SWM* website. As a reminder the link is: <http://www.pwpublishing.ltd.uk/swm/downloads/>

APRS Update

One or two readers have written asking about this mode and its applications. If you've not come across it before, APRS is Automatic Packet Reporting System and is an extension to the amateur packet radio system. The system was originally developed by Bob Bruninga W4APR and is a rapidly growing system that adds positional information to packet data. There have been some great software packages developed to support the mode that allow you to keep a plot of station activity on a map. The real gem is the ability to link GPS units to the packet radio set-up and so deliver real-time position reporting. This is particularly useful for emergency situations where the control point can track everyone without them having to give manual position updates. In the USA the system is used to provide weather and storm reports, there is growing popularity this side of the Atlantic too. If this takes your fancy it's well worth a look. You will obviously need packet radio receiving facilities and the following programs provide a useful insight into the levels of activity:

<http://www.ui-view.com/>
<ftp://ftp.tapr.org/aprssig/winstuff/> *WinAPRS*
<http://www.tapr.org/~kh2z/aprsplus/>

The frequencies to monitor are: 144.800MHz (f.m.) v.h.f. for UK activity and 10.151MHz (l.s.b.) on h.f. for global activity. I'll give a more complete update in a future 'Decode'.



Fig. 6: Example of what you can see with APRS - this is *UI-View*.

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

■ E-MAIL: dxtv@pwpublishing.ltd.uk WEB: www.test-cards.fsnet.co.uk

DX Television

The first few days of March were supportive of F2 reception, but followed by occasional mornings of shorter and less intense openings. The Grand F2 finale occurred on Sunday the 17th. An excellent tropospheric opening at the end of the month produced Polish TV and Czech f.m. radio signals in the UK. The proposed end of February closure of Spanish Band I outlets failed to take place: on the 3rd the Madrid E2 transmitter was received at strength in South Africa. In fact, the transmitter is still being received in early April!

Reception Reports

The opening on the 1st produced exceptionally clear pictures from Iran on E2 (IRIB-2). At 1038, **Stephen Michie** (Bristol) saw a veiled woman presenter followed by football. By 1052 Syria E2 had stole the scene with equally clear studio shots followed by the distinctive 'petal' clock preceding the news. The opening on the 3rd produced IRIB-1 pictures on E2. It is interesting to note that most of the E2 outlets are located along the border with Iraq. **Vincent Richardson** (Dolgarrog) noted F2 activity on the 3rd and 11th.

The final reported opening in the UK occurred on the 17th, when **Simon Hockenull** (Bristol) and **Peter Barber** (Coventry) encountered a short, but sweet opening into Iran (IRIB-1 and IRIB-2) between 0820 and 0901.

F2 and TEP died after March 12th, reports **Lt. Col. Rana Roy** (India). Since then several Band III stations in Pakistan and India have been received via enhanced tropospherics.

Tropospheric reception materialised towards the end of March. Shortly after 0900 on the 28th **Peter Barclay** (Sunderland) identified TVP-2, a Polish station (Szczecin on Channel R30), by its white '2' logo in the upper right of the screen and also its 6.5MHz sound spacing. The signal lingered for around 40 minutes before disappearing beneath Denmark and later Sweden. Surprisingly there were few other u.h.f. DX signals around at the time.

During the evening of the 28th and throughout the morning of the 29th, several Swedish networks were resolved. At one point during the morning of the 29th, both the 1st and 2nd networks were simultaneously radiating the PM5534 test card. This was quite an incredible sight with so many broadcasters showing round-the-clock programmes.

Interference

Peter Barber recently added a video recorder to his set-up, but was horrified to discover interference radiation at 48.230MHz, i.e. Channel E2. The problem was r.f. signal leads running too close to the front panel of the recorder. Another source of Band I interference seems to originate from a certain make of central heating boiler which produces black squiggly lines throughout the band.

Belgian Forces TV

While travelling through Europe recently, **Geoff Scott** (Blackpool) discovered that Belgian Forces TV is still active in Germany. To the west of Cologne, BRT and RTBF on E25 and E41 were received from relays in Bensberg with e.r.p.s of 600W.

At the ferry port in Zeebrugge two Dutch 'locals' were observed around Channels E25 and E58, the latter displaying colour bars.

FM Reports

On the 24th, Simon Hockenull and Stephen Michie heard the various Croydon f.m. services during slight lift conditions. On the 29th, we have a report of a Czech station on 87.6MHz, received by **John Faulkner** in Sutton-in-Ashfield; this was identified as 'Radio Impulse'.

Vincent Richardson (Dolgarrog) is still experiencing reception from Dublin Country Radio even though his location is totally screened from the west. Vincent feels that the signals are bounced from the hills to the east of him, rather than Great Orme's Head, which is to the north.

A portable DAB radio was spotted recently sporting a price tag of £499. It was an ugly wooden monstrosity, reminiscent of the portables of the Fifties, featuring miniature valves. An external antenna and power source is required to power the so-called 'portable'. Unfortunately, the salesman declined to demonstrate its quality sound via its own speakers!

According to Simon Hockenull, the bit-rate of some DAB broadcasts have been reduced thus affecting sound quality. However, **Peter Chalkley** (Luton) has purchased a VideoLogic DAB tuner and is very impressed especially with BBC Radio 3.

Service Information

Switzerland: Major changes to the country's tri-lingual TV network took place in April. In the past, SF-1 (German), TSR (French) and TSI (Italian) have all been aired from each transmitter. In future only the relevant programme will be aired in the different speaking areas. For instance, TSI on E34 from La Dôle in the French-speaking western part of Switzerland will no longer be broadcast. The aim is to free-up frequencies for new services, such as a second network and digital TV. The other services will be available via digital satellite.

Originally available only via cable, SF-2 has aired terrestrially for over a year in the German-speaking areas. TSR-2 and TSI-2 are to be aired terrestrially in the future.

A new service 'Rumantscha' is to be distributed via cable throughout the Rumantsch-speaking areas of eastern Switzerland.

Local station 'Canal 9', currently operating in Sion and Sierre, will expand into the Valais region. It will also broadcast in the Monthey region as a joint venture with 'Tele 1C'.

Austria: A private TV network 'ATV' (Austrian Television) will commence this summer using u.h.f. channels. The higher powered outlets include:-

Channel	Transmitter	ERP (kW)
E21	Bregenz	350
E26	Graz	800
E29	Salzburg	800
E30	Klagenfurt	1050
E31	St Pölten	600
E36	Innsbruck	600
E37	Linz	500
E65	Wein	500

Lithuania: From July all TV transmitters in Lithuania will transmit in PAL only. The conversion from SECAM colour commenced at the beginning of March. This month's Service Information was kindly supplied by **Lionel Michelland** (France) and Gösta van der Linden (Netherlands).

Keep On Writing!

Please send your DXTV, slow-scan TV and f.m. reception reports, news, off-screen photographs and information to arrive by the first of the month to:- Garry Smith, 17 Collingham Gardens, Derby DE22 4FS. We can also use off-air pictures stored as JPG files on PC discs and good-quality video recordings. Our DXTV and Archive TV website can be found at www.test-cards.fsnet.co.uk

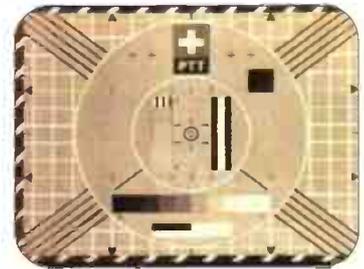


Fig. 1: The unique test card radiated during the 1960s and 1970s by the Swiss +PTT.



Fig. 2: Identification caption used by the German (SRG), French (SSR) and Italian (TSI) services in Switzerland in the 1960s and 1970s.



Fig. 3: The FuBK test card radiated in the Seventies by the Swiss +PTT.



Fig. 4: One of the eight new, very expensive and totally meaningless, Identification Symbols introduced by BBC-1 on March 29th, 2002.

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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



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Noise figure	6dB -2100MHz 1.5-2dB -1000MHz 1.8-2.5dB -1500MHz 2.5-4dB -2000MHz
3rd order IP	+38dBm typical PidB = +22dBm
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
Accessories	Mains wall plug adaptor (230V A/12V DC). Interface unit (remote supply unit) 12m coaxial cable and mast mounting clamps



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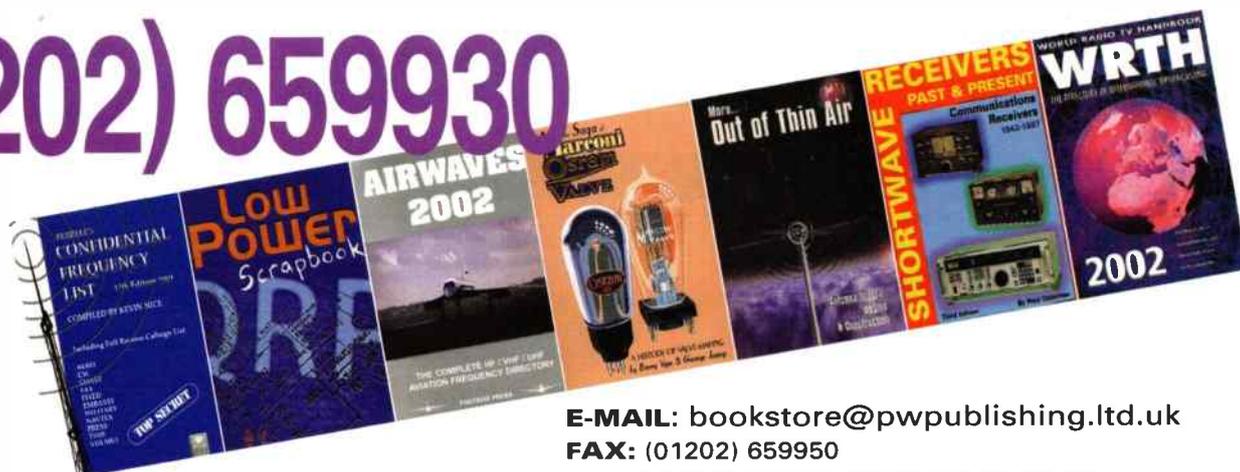
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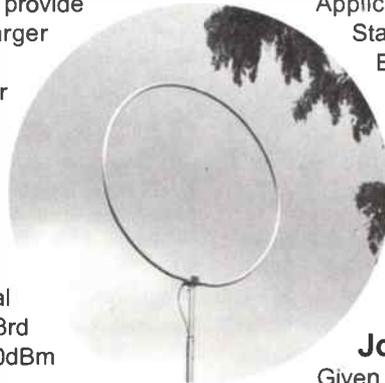
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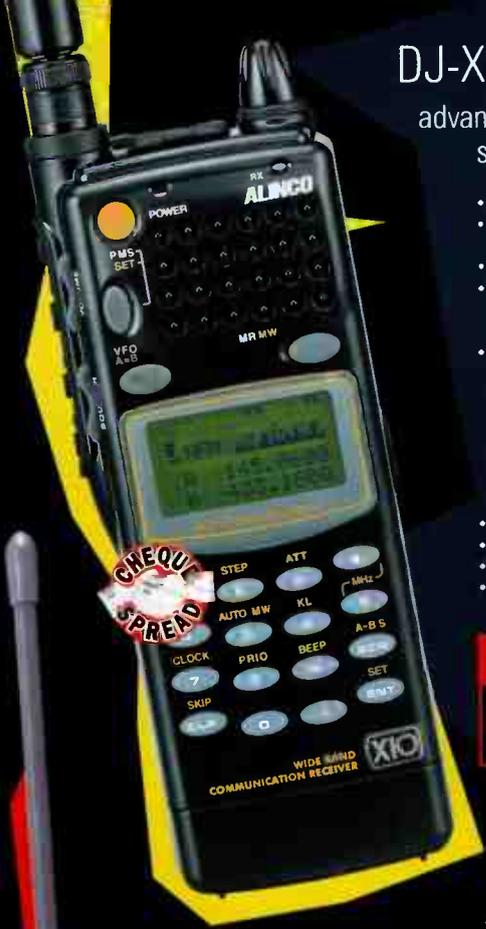
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