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- 66-956MHz (with gaps)
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- 400 Memories ● AM/FM/WFM
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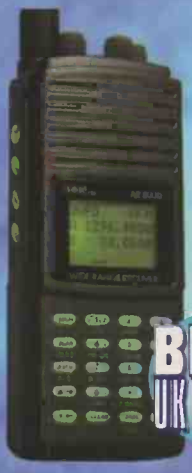

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- AM/FM/WFM/SSB/CW
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A top quality Wideband Antenna 25 - 1000 MHz with rubber boot protected magnetic mount and cable/BNC connection.
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- 1000 memory channels with memory name function
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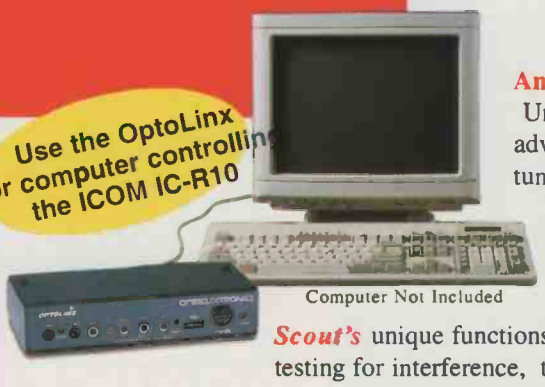
Reaction Tune the NEW ICOM IC-R10

Use the OptoLinx for computer controlling the ICOM IC-R10



Computer Not Included

Another radio to tune, another reason to purchase the *Scout*.

Until now the AOR AR8000/2700 were the only hand held scanners to take advantage of the ***Scout's*** Patented Reaction Tune function. The Scout can now tune the new ICOM IC-R10 hand held scanner (shown below). Connection is easy: No modifications required - No custom cables to buy - Just plug and play.

Scanner hobbyists and communication professionals benefit from the ***Scout's*** unique functions. Whether you're searching for new frequencies in your neighborhood, or testing for interference, the ***Scout*** is the ultimate communications tool.

Armed with a 400 frequency memory register, the ***Scout*** does not record duplicate frequencies, instead it coordinates repeated frequencies into a hit register storing up to 255 hits per frequency. Attach it to your belt and begin your day, the ***Scout*** will alert you when a signal is received by its beeper or vibrator function.

You won't miss a thing with Reaction Tune. The ***Scout's*** CI-V compatible output allows it to interface to the AOR AR2700/AR8000, ICOM R7000, R7100, R8500, R9000 and now the new IC-R10 (shown oposite). The ***Scout*** captures the frequency, then sends the serial data to the receiver and tunes the scanner to the frequency for instant monitoring in less than one second. Recorded frequencies can be downloaded to a PC using the optional OptoLinx universal interface •

SPECIFICATIONS

- 10MHz - 1.4GHz frequency coverage
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- Interface to a PC for frequency download using optional OptoLinx PC interface
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- 16 segment RF signal strength bargraph
- Frequencies are automatically saved when unit is turned off
- Reaction Tune the ICOM R7000, R7100, R8500, R9000, IC-R10, and AOR AR2700, AR8000, and the Radio Shack Pro 2005/6 using the Optoelectronics OS456, Radio Shack Pro 2035/42 using the Optoelectronics OS535

Scout with ICOM IC-R10
Mono Cable required (shown)

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Regular Columns

Good Listening

STILL HERE AFTER 60 GLORIOUS YEARS!

Communiqué

SEND YOUR NEWS TO KEVIN NICE AT THE EDITORIAL OFFICES

Coach Trip To Ham Radio '97

Calling all radio amateurs, s.w.l.s and people who are interested in radio - the **Barnsley & District Amateur Radio Club** are again running a coach trip in June 1997 to the largest amateur radio rally in Europe - the 1997 Friedrichshafen Ham Radio '97. It is understood that this is the only organised trip run from England to this event.

Staying just off the beautiful island of Lindau, just south of Friedrichshafen for six nights, the organised trip will be staying bed and breakfast in one of the local hotels. For anyone wishing to make their own accommodation either in Lindau or Friedrichshafen, the club are also doing transport only, and if you wish to book into a guest house, they will arrange this.

For further information or an information pack on this event, contact **Ernie G4LUE**, Secretary, at **8 Hild Avenue, Cudworth, Barnsley, South Yorkshire S72 8RN** or telephone on **(01226) 716339** or mobile on **(0836) 748958.**

Special Interest Course

Adrian Dening G4JBH has recently written in with news of a course that he is running on behalf of Somerset Education Department, at the beginning of April, called *Radio Communication*.

Radio Communication is a varied and wide ranging science. The course is aimed at using amateur radio to help demonstrate the theory behind, and uses of, the many radio transmissions from long wave broadcasts to microwave satellite uplinks.

This course, with a high practical and technological content, will be particularly suitable for those students who have previously attended a Space Science or similar course at Kilve. The course is also ideal for anyone who may be considering either a hobby or career in the field of radio communications.

Whilst the course is broadly aimed at those in the 13-16 year age group, a limited number of places is available for older students and adults. Existing radio amateurs and listeners are welcome to apply as the course provides an excellent opportunity to gain theoretical and practical experience and 'broaden horizons'.

Participants will be able to transmit during the weekend, as operation is under a special callsign **GB2KRC**. Normally, pass in a City & Guilds examination is required before an individual may be granted a transmitting licence. This is a recognised qualification and details of the necessary course will be supplied during the weekend, together with the information required to continue and develop an interest in radio.

Costs of the course are: under 18 - £73.50 and 18 and over - £85.50. Further information concerning the content of the course may be obtained from the Course Director, Adrian Dening G4JBH on **(01935) 413163**.

Portable Power

Merlin Equipment's new *NOTEpower 75i* inverter allows anyone on the move to run and re-charge notebook computers, test equipment and other small appliances in their car. By simply and silently converting the car's 12V battery power to 230V a.c. mains electricity, users have enough power to run all day without the need for expensive spare battery packs.

Even today's high tech notebook computers will last for just a few hours when running from their internal battery. By using the new matchbox size *NOTEpower 75i*, they never need to worry about short battery life ever again.

Specifically designed for operating small appliances by a leading computer manufacturer, the *NOTEpower* is safe to use with all machines available on the market. Supplied with a cigar lighter socket plug, the *NOTEpower 75i* simply plugs into the car cigar lighter socket for easy connection. Output is then fed to the appliance's own power supply 'brick' using the standard cable provided.

As well as giving notebook computers and test equipment indefinite battery life, the *NOTEpower 75i* can also be used to power peripherals such as bubblejet printers for a complete mobile workstation. Fully overload and overheat protected, the *NOTEpower 75i* inverter employs state-of-the-art electronics to provide a power source which is more than 90% efficient, thus making best use of the vehicle's battery power.

The unit is smaller, lighter and easier to use than any other on the market. . Useful features such as a battery alarm will warn that the vehicle's battery is low and turns the inverter off to allow re-starting of the car. The *NOTEpower 75i* also has a wide range of other useful applications, for example, running chargers for camcorders, small power tools and providing other equipment with mobile 230V a.c. power. It is CE approved, conforming to EU directives for electrical interference and safety, allowing the units to be confidently used in many applications involving sensitive electronics.

***NOTEpower 75i* d.c. to a.c. power inverter from Merlin Equipment.**

Retail price for the unit is around £86 excluding VAT and carriage. For further information, contact: **Merlin Equipment, Unit 1, Hithercroft Court, Lupton Road, Hithercroft Industrial Estate, Wallingford, Oxfordshire OX10 9BT, Tel: (01491) 824333, FAX: (01491) 824466, E-mail: 101756.3500@compuserve.com**

FEBA Radio Sunday

FEBA Radio is an international radio mission, communicating the Gospel of Jesus Christ, principally through the use of radio and programme follow-up. FEBA broadcasts from the Seychelles and elsewhere in 52 languages to more than 30 countries ranging from Indian, Nepal and in Central Asia and the Middle East, to Kenya, Ethiopia, Mozambique and the Indian Ocean islands.

The 8th FEBA Radio Sunday held on 27 April is focusing on Feba's short wave broadcasts to the Arab world, now in their 25th anniversary year. What's is all about? Well, it's an annual opportunity for churches around the UK to have FEBA Radio prayer spotlight in one of their services on or around the date and the date is always the last Sunday in April.

A FEBA Radio Sunday Information Pack can be requested from Jennie Ring at FEBA Radio's Worthing address, which is **Ivy Arch Road, Worthing, West Sussex BN14 8BX.** The free pack

contains prayer suggestions, short interview on cassette (this year's interview is with a FEBA leader in the Middle East), OHP acetates to show while the cassette is playing and 'take home' information leaflets.

Stereo Coverage For UK TV

Digital stereo sound can now be received by all viewers of ITV, Channel 4 and S4C after a major investment project by transmission provider NTL. Even in the remotest areas served by terrestrial television, high quality stereo sound can be received with the benefit of an all-digital path from the studio to the receiver.

The engineering work has included modifications or complete replacement of transmitters at over 50 key sites throughout the UK. NTL promised in early 1994 to complete NICAM coverage by the end of 1996, and the final installation was achieved at Skriaig, Isle of Sky, on December 6th.

John Roberston, chief engineer at Grampian Television said, 'We have some of the most isolated viewers in the UK and its excellent that we can all have the same superb quality of stereo TV sound, be it central London, the Western Isles or the Orkneys. NTL has put a lot of effort into keeping the networks right up-to-date.

If you're wondering what NICAM actually stands for, it's Near Instantaneously Companded Audio Multiplex and, as applied to terrestrial TV, is a system which conveys two channels of near CD quality audio in addition to the normal analogue mono sound. Viewers require a stereo set or video recorder fitted with a NICAM decoder.

T2FD Universal Magnetic Balun

Wellbrook Communications have launched the T2FD Universal Magnetic Balun specifically designed to simplify the home construction of the T2FD antenna. A specially wound 9:1 Balun, together with a thick film 500Ω 5W termination resistor, is fitted into a small ABS box. The completed assembly is encapsulated in epoxy resin to ensure reliability in the most severe weather conditions.

Using this Balun removes some of the daunting problems faced by the home constructor of a T2FD antenna of winding the Balun, providing the separate termination resistor and then 'potting' the completed assembly.

The unit is fitted with a BNC connector for the downlead to the receiver and four screw terminals. Two of these terminals give access to the termination resistor, the other two being for connecting to the antenna. Two 4mm diameter holes allow the unit to be screwed to the central spreader of the T2FD assembly.

An isolated feeder winding on the Balun is used to reduce noise from being coupled to the antenna from the feeder.

A data sheet provided with the unit includes comprehensive construction suggestions using readily obtainable materials.

The Balun can also be used without the termination resistor for longwire and dipole antennas. The T2FD Universal Magnetic Balun costs £27.95 plus £2 P&P from **Wellbrook Communications, Wellbrook House, Brookside Road, Bransgore, Christchurch, Dorset BH23 8NA. Tel: (01425) 674174.**

The Receiver Review

Twrog Press - based near Blaenau Festiniog - has just published the second edition of their useful little book, *The Receiver Review* by Dave Morgan GW4KYZ.

This is a companion to their *Rig Review* and gives basic specifications on a wide range of receivers, mainly in the frequency range up to 30MHz but with some v.h.f./u.h.f. receivers included.

The book is divided by manufacturer and even includes several old favourites from the past - Eddystone have a large section covering their receivers as have Collins, Hammarlund, Hallicrafters and Heathkit.

A final section, titled 'Various', covers army surplus, professional equipment and one-off models for the amateur bands.

If the receiver has been reviewed, to the author's knowledge, this is noted at the end of the relevent model entry. The Receiver Review costs £5.00 inc. P&P from **Twrog Press, Penybont, Gellilydan, Blaenau Ffestiniog, Gwynedd LL41 4EP**.

WorldDAB

A new stage in the world-wide spread of digital audio broadcasting - DAB - has been marked by the inauguration of a World DAB Forum to succeed the European DAB Forum (EuroDAB) founded in 1995.

At least twenty countries, including Canada, China, Austrailia and India, as well as many European nations, will have operational or pilot services running by the end of this year, when the first consumer radios will be available.

A fundamental advance in radio technology and a bigger step than the introduction of f.m., DAB will take radio into the multi-media age, offering text and data as well as near CD quality sound. DAB is the first radio system designed to work equally well with fixed, portable and car radios.

The Eureka 147 system now being introduced in Europe, Canada and planned for other countries, was devised by a consortium of European broadcasters, research institutes and electronic companies. It is claimed to be the only digital system to be fully specified and to meet the ITU's requirements for a world standard.

The President of the World DAB Forum, David Witherow, said "This is a landmark year for DAB as we prepare to make the benefits of this brilliant new radio technology available to consumers. While the initial thrust has been in Europe and Canada, we are seeing much activity in other parts of the world and through the World DAB Forum we can share experience and help resolve any outstanding implementation issues. I am confident that this co-operation will play a major part in ensuring DAB's success."

It is estimated that in Europe more than 100 million people will be within reach of DAB by the end of 1997. Most of the world's leading receiver manufacturers should be displaying consumer DAB products at the International Consumer Electronics Fair (IFA97) in Berlin this coming August.

Retrofit Computer Control

The Optoelectronics OS456 *LITE* is an after market board for installation into the Radio Shack PRO-2005/2006 base scanners. The addition of The OS456 *LITE*, hailed as providing entry level PC scanning, equips the PRO2005/2006 user with computer control via both RS-232 and CI-V interfaces. A tape remote control output is also

Welz Winner Update

Peter Herbert M1ANJ, who won the Welz WS1000E scanner donated by Waters & Stanton Electronics, says it will make a welcome addition to his shack, and also for use when he is out and about. Peter passed both parts of the City & Guilds Amateur Radio Examination last May, after attending an evening class at Sawston College near Cambridge.

At present, he is trying to get to grips with Morse to gain his amateur class A licence. Peter also belongs to the Huntingdonshire Radio Society and uses a Yaesu FT-530 dual-band hand-held, which, he says, has to double up as both a mobile and base set with a collinear mounted on the roof at about 13m.

Congratulations once again Peter!

Welz winner Peter Herbert M1ANJ.

featured. The converted receiver becomes compatible with the Optoelectronics Scout and can be reaction tuned by the same in less than one second per captured frequency.

The OS456 *LITE* is supplied complete with leads and software to transform your ageing scanner to a computerised monitoring station.

Scan at the incredible speed of 80 channels per second - using Probe software.

OS456 *LITE* is supplied with leads and fixing hardware to allow a straight forward installation in to the host radio. No soldering is required. After following the comprehensive installation and set-up guide you are ready to go. ScannerWEAR and San*Star demos are supplied with OS456 *LITE*. For more information contact: **Waters & Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS, Tel: (01702) 206835, FAX: (01702) 205843.**

RSGB Council News

Ian Kyle GI8AYZ was installed as the 63rd President of the RSGB at a ceremony held on Saturday 8 February at the Forte Posthouse, Dunmurry, Belfast. Unlike recent installation ceremonies, Ian's took the form of a Zonal Open Meeting of the Society, which was open to anyone with an interest in Amateur Radio or the Society from all parts of Ireland. This took place in the afternoon and was followed by the installation Ceremony and Dinner in the evening.

The Society also announced that the new Executive Vice-President is John Greenwell G3AEZ. Our own 'Amateur Bands' columnist, Paul Essery GW3KFE is the new Chairman of the Membership Liason Committee, filling the vacancy left by Ian Kyle when he became President. David Butler G4ASR, who compiles the 'VHF Report' column in our sister magazine *Practical Wireless*, resigned recently from the position of VHF Manager and has been replaced by Ian Cornes G4OUT, who is also continuing with his duties as VHF Awards Manager.

To bring it in line with the Society's other committees, the Repeater Management Group has been renamed the Repeater Management Committee and Chris Goadby G8HVV is its new Charman, replacing Geoff Dover G4AFJ, who was recently elected to RSGB Council.

Radio and TVDX News

An interesting TVDX catch looks possible for northern UK enthusiasts with the opening of 'Channel 6' in Edinburgh on ch. E34 during mid March '97. The later than hoped for opening was delayed following delays of paperwork from the Radio Authority and DTI. Initially some 300 text pages will be available including news, information and local advertising. Local groups - university, council, etc. are being invited to access Channel 6's 800-page

Loral Wins Chinasat Contract

Palo Alto based Space Systems/Loral (SS/L), a Loral Space & Communications Ltd. company (NYSE:LOR), has received from China Telecommunications Broadcast Satellite Corporation (CHINASAT) the authority to proceed on construction of CHINASAT 8, a high-powered communications satellite that will provide video, data and digital voice service throughout China. The contract will be finalised over the next several weeks. Based in Beijing, China, CHINASAT is a division of the Ministry of Posts and Telecommunications (MPT) of the People's Republic of China.

Under the contract, Space Systems/Loral will provide the CHINASAT 1 satellite operating on both C and Ku-band frequencies. The satellite will be delivered on orbit in late 1998. Service is expected to begin in 1999 and will provide communications coverage to the whole of China.

"This contract, coupled with CHINSAT's earlier agreement to be the exclusive Globalstar service provider in the People's Republic of China, reinforces and solidifies Loral's long-term relationship with the MPT, the major telecommunications provider in China, a large and important market for Loral," said Bernard L. Schwartz, chairman and Chief Executive Officer of Loral Space & Communications Ltd.

The CHINASAT 8 satellite, the most powerful satellite yet purchased by China, will have a total on-board satellite power of 11kW. The spacecraft will have the ability to operate 16 Ku-band channels at 125W per channel, and 36 C-band channels at 37W per channel.

The CHINASAT 8 satellite is based on the high-powered version of Space Systems/Loral's FS-1300 standard three-axis spacecraft and will have a mission life of 15 years. This project brings the total number of satellites in this family of spacecraft that have been built or ordered to 38, including 18 currently in production.

CHINASAT is responsible for managing, operating, and administrating domestic civil telecommunications broadcast satellite systems, developing and operating satellite telecommunications services, broadcast services, TV transmission services, and mobile telecommunications services. CHINASAT is the owner of several telecommunications satellites, China's world-class TTC&M earth station, and other supporting facilities. CHINASAT is also China's sole distributor of Globalstar mobile satellite services, which is scheduled to begin service in 1998.

Space Systems/Loral is a full-service provider of commercial communications satellite systems and services, including launch services and insurance procurement and mission operations from its mission control centre in Palo Alto, California. SS/L currently has a total order book of more than 70 spacecraft. In addition to building CHINASAT 8, the company is the builder of INTELSAT, N- STAR, Mabuhay, APSTAR, TELSTAR, PanAmSat and M2A communications satellites; direct broadcast satellites for TCI/Tempo, PanAmSat, L-STAR and ASkyB; the latest series of weather-watch satellites, GOES (Geostationary Operational Environmental Satellite), the Japanese MTSAT, the next-generation Japanese air traffic control and weather-watch satellite; and is the prime contractor for Globalstar's 56 low-earth orbit (LEO) mobile satellites.

Loral Space & Communications Ltd., headquartered in New York City, is a high technology company that primarily concentrates in space and telecommunications.

Loral manages and is the largest equity owner of both Globalstar, which is building and preparing to launch a worldwide satellite-based digital telecommunications system, and Space Systems/Loral, the world's premier manufacturer of large, high-powered satellites for telecommunications and environmental applications.

capacity - set-up costs were around £200 000 and half that sum for annual running costs.

A possible interference source around Birmingham on ch.E2 could be the local hospital radio service, which uses 48.45MHz as a programme circuit link between the main studio at Dudley Road Hospital and other establishments in that area. Output power is claimed to be 1W wideband f.m. - a basic notch filter should reduce the problem and leave ch.E2 carrier at 48.25MHz at least useable.

The Spanish authorities have given permission for TVE to establish a commercial digital TV service called 'TVE Tematica' with financial backing of nearly £120 million in 1997.

In the Czech Republic, Nova TV has just started teletext but intends to remain with mono sound and single language transmission for the forseeable future. Next door in the Slovak Republic STV should have now hit the satellite airwaves with their terrestrial licence expiring December 31st. All TV transmitters operating on chs. R4 and R5 have closed and have re-appeared at u.h.f.

The ch.E12 TV service of TV2 Oslo carried a caption early January stating that the v.h.f. service would close January 22 and move to ch. E30 along with five other transmitters. At the time of the caption, the ch.E30 transmitter from the Tryvann Tower was operational. It's likely that the ch.E6 NRK-1 transmitter will also move to u.h.f. shortly as part of the long term plan to move all v.h.f. transmissions to u.h.f. Norkring (jointly owned by NRK and Telenor with NRK holding a 60% stake) has split with Norwegian Telecom and now Norkring owns all NRK and TV2 transmitters, the terrestrial microwave system, SNG and OB services. When NRK became a public company they became eligible for VAT/tax and received demands for £7 million - the result was to cut staff at NRK-2 and reduce programme hours to about four hours daily. The transmitters are still switched on during the day (as of early January) suggesting lots of test cards!

In Kazakstan the authorities have auctioned private broadcasting licences in two main cities (Akmola and Almaty) to overcome the problem of illegal TV transmissions. Costing up to £100 000 and with an annual £15 000 levy the new stations will operate against the only private broacaster NTK and regional public network Kazak-TV.

Major Pipeline Contract Secured by TSI

Telecom Services International Ltd., the UK based system integrator, has just been awarded its first major turnkey contract.

The contract, worth almost $650 thousand to TSI, is for the design and installation of a digital telecommunications network for a recently constructed gas pipeline in Bangladesh.

The network is configured using v.h.f. point-to-point radio links, v.h.f. repeaters and telephone interconnect. The network also includes a large PABX, complete network management system and partially redundant operation.

The network is designed to provide high quality voice and data to pumping and control stations along the pipeline's 250km length. Additionally, at each station, a repeater will be installed allowing mobiles and portables in the vicinity to make and receive telephone calls.

The project will be completed by August 1997 and will be performed in conjunction with TSI's in-country agent Transworld Ltd. in Dhaka.

TSI started business in 1996 and has concentrated it's efforts toward 'total system solutions' in developing nations. TSI can draw on extensive experience and a diverse range of products to design the most suitable solution matching the customer's requirements.

J. R. Tweedy

SWM have recently learned of the sad news that Jack Tweedy G3ZY died on 2 January 1997.

Well known in the field of amateur radio, Jack had been in business for 35 years trading as J & A Tweedy of Chesterfield. It was from Jack's emporium located in Woodhall Spa that a fourteen year old Assistant Editor, aquired his first commercial receiver.

Jack's interest in amateur radio was far and wide, operating mostly on the key. He was, for many years, a Morse examiner in conjunction with the RSGB.

Jack Tweedy G3ZY will be sadly missed.

National Transmitter News

New NICAM Stereo Service

Selkirk: The Selkirk, and its low-powered relay stations, are now equipped for broadcasting BBC1 and BBC2 television programmes with stereo sound, using the BBC's NICAM 728 digital system. This uses an additional transmitted signal, quite separate from the normal nono TV sound signal.
The Selkirk television transmitter is located on Lindean Moor and serves about 90 000 viewers in the Borders area.

New Television Transmitters

Southway: A new television relay station opened on 12 November '96 to serve the Southway and Tamerton Foliot areas about 6km north of Plymouth City centre.

The relay is a joint effort by the BBC and NTL on behalf of ITC and is located on a mast above Whitleigh Wood. It should bring good television, NICAM and teletext reception to about 430 people in the village of Southway and neigbouring Tamerton Foliot.

Station details

Channels:	BBC 1 (South West)	55
	BBC 2	63
	ITV (Westcountry)	59
	Channel 4	65
Antenna Group:	C/D	
Polarisation:	Vertical	
ERP:	10W	
Grid reference:	NS 921 796	

Noise Reduction From Lake

Many simple receivers have one major problem, excessive high frequency noise (hiss). This noise on a signal makes it very tiring to listen to for long periods. What is needed is a noise filter - to take away the noise and just leave the wanted signal.

An ideal filter wouldn't need a power supply, and may be added to any receiver. The **Lake Electronics** NRF2 filter is such a filter.

The NRF2 is a simple looking 70x48x24mm box with an input lead, an output socket and a switch to bring the unit in and out of operation. It's supplied with two adapters (3.5/6.3mm and 6.3/3.5mm) to fit into the headphone socket of the radio, so the NRF2 can cope with any combination of socket an plug on the radio and headphones.

The NRF2 is very effective, and costs **£16.50 plus £1 P&P**. To order yours contact **Alan Lake at 7 Middleton Close, Nuthall, Nottingham NG16 1BX. Tel: 0115-938 2509**.

SEND YOUR NEWS TO:
Short Wave Magazine
ARROWSMITH COURT, STATION APPROACH, BROADSTONE, DORSET BH18 8PW.

Rallies

March 1: The 4th West Wales Amateur Radio & Computer Rally will take place at Penparcau School, Aberystwyth. Doors open at 10.30am to 4pm (disabled visitors 10am). Admission is £1. All on one level with ample free parking. There will be trade stands, computers and radio, Bring & Buy, special interest groups, Repeater Group, West Wales Packet Group. Listen out for h.f. and v.h.f. GC0ARA on the air. There's also lots more for the amateur radio and computer hobbyist, this is where the bargains are. Talk-in on S22. Further details and trade bookings from **Katy** on **(01545) 580675**.

March 2: The West Manchester Radio Club's Red Rose Rally will be held at Horwich Leisure Centre, Victoria Road, Horwich, near Bolton of J6 M61. There will be a cafe, bar, Bring & Buy, special interest groups, parking for 300 cars and children's activity room (up to 7yrs), supervised by parent. Doors open 10.30am and admission is £1, children free. Talk-in on S22. **Albert** on **(01204) 62980**.

***March 8-9:** The London Amateur Radio & Computer Show is to be held at the Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London, N9. Doors open 10am to 5pm each day (disabled visitors from 9.30am). There will be a trade show, with over 100 exhibitors, Bring & Buy, RSGB Committee and book stands, on-demand Morse tests, talk-in on 144 and 430MHz, special interest groups, disabled facilities, priority admission for disabled persons, bars, restaurants, ample free car parking and lectures. **(01923) 893929**.

March 9: The Wythall Radio Club are holding their 12th Annual Radio Club Rally on Sunday at Wythall Park, Silver Street, Wythall, near Birmingham on the A435, just two miles from junction 3 of the M42. Doors open from 10am to 4pm. Admission is just £1. The usual traders in three halls and a large marquee. Bar and refreshment facilities on site, big Bring & Buy stand and talk-in on S22. More information from Rally Organiser, **Chris G0EYO** on **0121-430 7267** evenings, weekends for details.

March 16: The Tiverton South West Amateur Radio Club are holding their annual mid Devon Rally at the Ponnier Market, Tiverton, Devon, only minutes from junction 27 M5. There is excellent free parking and refreshment facilities available throughout the day. Doors open at 10am. Talk-in on S22. more details from **Alan G0MAS** on **(0884) 252259.**

***March 16:** The Norbreck Radio, Electronics & Computing Exhibition by the Northern Amateur Radio Societies Association will be held at the Norbreck Castle Hotel Exhibition Centre, Queens Promenade, North Shore, Blackpool. Doors open 11am (10.45am for disobled visitors). Lots of trade stands, Bring & Buy stand, RSGB stand, amateur computer stands, free car parking, free shuttle bus from car park and wheelchair access to all stands. Admission £2, OAPs £1, under 14s free. **Peter Denton G6CGF** on **0151-630 5790**.

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

* Short Wave Magazine & Practical Wireless in attendance

Bandscan AUSTRALIA

This time the big news is the Mansfield Review into the Australian Broadcasting Corporation (ABC) and its implications for Radio Australia and other ABC services. In addition I have some telecommunications news plus some more frequencies to chase and web sites to try.

Review Of ABC

In Bandscan Australia in September 1996, I noted that as well as bearing large budget cuts, the Australian Broadcasting Corporation (ABC) would be subject to a review of its future role and direction. That review has now taken place conducted by businessman and former Optus chief Bob Mansfield.

From the point of view of *SWM* listeners, the big loser looks like being Radio Australia (RA). The ABC in a submission to the Mansfield Review signalled that it no longer regarded RA as being a vital part of its operations and that it needed to reassess its priorities in the area of short wave radio and international broadcasting.

The final report from the Mansfield Review has recommended that the ABC be no longer required to broadcast to audiences outside Australia. This will need a change in the ABC's charter which currently gives equal prominence to domestic and international audiences.

Managing Director Brian Johns of ABC has been quoted as saying that a change to the charter would give the government an opportunity to influence the ABC's direction, he sees this as a risk. Given the ABC's fiercely independent stance over many years I would concur with this assessment.

Commentators here have interpreted this recommendation on international services to mean that the way will be cleared for the government to shut down Radio Australia altogether and to sell Australia Television. Reasons for the proposed closure of RA include RA's declining audience down from an estimated 100 million people in 1981 to around 20 million people today.

It is also argued that RA is an arm of Australian foreign policy and should rightfully come under the wing of the Department of Foreign Affairs and Trade (DFAT). DFAT apparently is considering running its own form of this overseas service and Minister for Communications and the Arts Senator Richard Alston has said that RA plays a significant role in Australia's diplomatic and trade objectives.

Savings for the ABC's $A500 million (about £235 million) budget will be in the order of $A20 million (£10 million). Although this is relatively small taken across the entire ABC budget it is a large proportion of the $A55 million (£26 million) that the ABC needs to save as part of the first round of budget cuts announced last year.

It is interesting to note that the day before the Mansfield Review was handed down a 1996 Cabinet submission from Minister Alston was disclosed in a major daily newspaper here. The Cabinet submission is reported to have Alston seeking this review of the ABC rather than an immediate budget cut because this approach would minimise political damage to the government.

Senator Alston denied that he was trying to influence or control the ABC and that the Mansfield Review was not a front for further cuts to the ABC. Other changes recommended by the Mansfield Review are that all television production except for news and current affairs be sourced from private production houses which would be expected to take up many of the perhaps 1000 redundancies caused by such a change.

The sale of production facilities would be expected to free up around $A345 million (£162 million) investment in land and buildings which would then be used to hasten the process of digitisation within the organisation. The good news? The ABC will continue to remain free of advertising and commercial sponsorship and no domestic networks will be closed.

The Community and Public Sector Union is not particularly thrilled with any of this stating that the review has given the Government what it has wanted from day one - a smaller, compromised and weaker ABC. They see that the ABC's role as a truly independent broadcaster will come to an end with the implementation of the review's recommendations.

More Frequencies

Again this month I have a few more h.f. frequencies for readers to check out. Last time I tabled frequencies for the Cairns School of Distance Education which broadcasts to isolated school children in that region.

This time I have spoken to two of the other Queensland schools and bring their frequencies. The Charleville school operates at 1kW u.s.b. largely between the times 2200-0500UTC on 4.045, 5.227, 5.243, 5.853, 6.945, 7.792 and 8.045MHz.

The Chartres Towers school operates the same basic times with what they call their Galah Sessions on 4.992MHz after 0500UTC. Frequencies are 4.583, 4.791 and 4.992MHz at 1kW and 4.463 and 5.221MHz at 400W. All frequencies are u.s.b.

The 4.463MHz signal is translated on the resort Hamilton Island to u.h.f. for students living there. I will bring frequencies from Brisbane, Longreach and Rockhampton next time.

The New South Wales (NSW) ambulance service uses 3.7415, 4.9515 and 7.5975MHz; the NSW State Emergency Services uses 2.5630, 2.5645, 2.5690, 2.5705, 2.5720, 2.5735, 2.5750, 2.5765, 3.7290, 3.7305, 3.7430, 3.7445, 4.5670, 4.5685, 7.3300 and 7.3315MHz; and the NSW Department of Bush Fire Services uses 2.6615, 4.6465 and 6.9415MHz. These emergency services frequencies are from Australia's *Radio and Communications* magazine and have not been checked by me. Good luck!

Web Sites

The Australian Ionospheric Propagation Service is at **http://www.ips.oz.au/** and offers a regularly updated solar terrestrial report, a range of h.f. prediction services and links to a good range of other relevant Australian and international sites. It also provides links to background information on the sun, the planets, the ionosphere and space weather.

The URL **http://www.mpce.mq.edu.au/~guy/amateurs.html** has a growing list of Australian amateur radio operators on the web. WICEN, now renamed from the Wireless Institute Civil Emergency Network, is at **http://marconi.mpce.mq.edu.au/wicen/**

I mentioned last time Bob Padula's Electronic DX Press. More details can be found at **http://www.wp.com/edxp/** Paul Dwerryhouse from the University of Melbourne has a swag of short wave information at **http://www.ee.mu.oz.au/staff/pbd/SW/index.html**

Greg Baker,
PO Box 208, Braidwood,
NSW 2622, Australia.
E-mail: greg@pcug.org.au

Other News

The government has finally managed to get through the Australian Parliament a bill which will eventually lead to the sale of one third of the nationally owned telecommunications company Telstra. Proceeds are earmarked for the retirement of national debt and for an enhanced national environmental programme.

Supporters of the sale have been enthusiastic over the benefits saying that the 24 000 jobs to be lost from Telstra will be made up for with an anticipated 120 000 jobs within the general telecommunications sector. The analogue mobile telephone system in Australia will be phased out as currently used frequency spectrum is withdrawn in stages beginning on 1 January 1997.

The system will close altogether on 1 January 2000 except from a few areas where no other options are available to provide mobile telephone services to existing customers. These areas are largely sparsely populated and remote areas.

Siemens Plessey has been awarded a $A56 million (£26 million) contract to provide 4600 v.h.f. combat net radios to the Australian Defence Force. These radios will replace transceivers that came into operation in the 1960s.

I welcome any news and comments. In particular I am interested in any s.w.l. 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 208, Braidwood, NSW 2622, Australia**. For personal replies please send two IRCs. Those with an Internet connection can E-mail me at **greg@pcug.org.au**

Grassroots

Club Secretaries:
Send all details of your club's up-and-coming events to:
Lorna Mower, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

AVON

Bristol International RC: Tuesdays, 8pm. The Little Thatch Country Club, 684 Wells Road, Whitchurch, Bristol. All visitors are welcome. The club has been formed so that all radio enthusiasts, whether they be Licensed Amateurs, s.w.l.s or CBers' can get together and have a good natter and do things that you do in radio clubs. PO Box 28, Bristol BS99 1GL.

RSGB City of Bristol Group: last Tuesdays, 7pm. New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. March 25 - The Enigma - Eric Williams has first hand information on the fascinating facts of this incredible WW2 cipher machine. Robin Thompson G3TKF on (01225) 420442.

South Bristol ARC: Wednesdays, 7.30pm. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. March 5 - 15m activity evening, 12th - HF workshop for newcomers, 19th - Build a basic receiver - club project, 26th - 2nd evening to build a receiver. For more information ring (01275) 834282 on a Wednesdoy evening.

BEDFORDSHIRE

Dunstable Downs RC: Fridays 8pm. Chews House, High Street South, Dunstable, Bedfordshire. New members and visitors welcome, just drop in or call Paul G7TSJ on (01582) 861936.

BUCKINGHAMSHIRE

Aylesbury Vale RS: Wednesday evenings, 8pm. Hardwick Village Holl, (Hardwick is situated off the A413 between Aylesbury and Buckingham). March 19 - AGM. Gerry Somers G7VFV on (01296) 432234.

DERBYSHIRE

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. Mortin Shardlow G3SZJ, 19 Portreath Drive, Allestree, Derby DE22 2BJ on (01332) 556875.

DEVON

Appledore & DARC: 3rd Mondays, 7.30pm. Appledore Football Clubroom. March 18 - AGM. Dave Brierley G3YGJ. (01237) 476124.

EDINBURGH

Lothians RS: 2nd & 4th Wednesdays, 7.30pm. Orwell Lodge Hotel, Polworth Terrace, Edinburgh. March 12 - Junk sale, 26th - Flight Simulators. Tommy Main GM4DCL, QTHR on 0131-663 8501 day and evening.

GREATER LONDON

Southgate ARC: 2nd & 4th Thursdays. Winchmore Hill Cricket Club, The Paulin Ground, Firs Lane, Winchmore Hill, London N21 3ER. February 27 - Radio on the air, March 27 - Radio on the air. M. Viney G0ANN on (01707) 850146.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road SW19. March 14 - Junk sale. (01737) 356745.

HAMPSHIRE

Horndean & DARC: 1st & 4th Tuesdays, 7.30pm. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. March 4 - Natter night, 25th - Any questions? S. Swain (01705) 472846.

Southampton ARC: Mondays, 7pm. This club is now up-and-running after some years of inactivity. New members welcome. Harold McIntyre on (01703) 737715.

HERTFORDSHIRE

Harpenden ARC: 1st Thursday of the month from September to May, at Aldwickbury School, Harpenden. Morse classes each Monday during term time. March 6 - Annual junk sale. Further details from Peter 2E1BDB on (01727) 860631 or John G4JOV on (01582) 765821.

ISLE OF MAN

Isle of Man ARS: 1st Mondays, 8pm Transport House, Fort St, Douglas. Other Mondays, 8.30pm, Royal Naval Assoc, Regent St, Douglas. Every Thursday, The Manx Legion, Peel, 9pm for an informal get together. Chris Wood GD6TWF, 2 Lyndale Avenue, Peel, Isle of Man.

KENT

Dover RC: Wednesdays, 8pm to 10pm during term time. Duke of York's Royal Military School, Dover. Morse classes are held from 7pm to 8pm and Novice training courses are also conducted as required at that time. The club is in the course of registering as a C&G Exam centre and hopes to be operational as such in time for the May exams next year (1997). The club also operates a CB station and encourages practical project work. Brian Hancock G4NPN on (01304) 821007.

Maidstone YMCA ARS: Fridays, 8pm. YMCA Sports Centre, Melrose Close, Maidstone, Kent, ME15 6BD. February 28 - Radio radar lecture by Nick Parnell/John Button, March 3 - EMC by Peter Pickering (RAE), 14th - Antennas by Peter Pickering (RAE), 21st - Propagation by Peter Pickering (RAE). (01622) 743317.

NORFOLK

Norfolk ARC: Wednesdays, 7.30pm. Formal and informal meetings at The Norman Centre, Bignold Road, Off Drayton Road between 'Asda' and Three Mile Cross Roundabout, Norwich. March 5 - Night on the air, construction QRP and Morse practice, 8/9th - Club trip to London Amateur Radio & Computer Show, 12th - HF NFD (c.w.) briefing, 19th - Night on the air, construction QRP and Morse practice, 26th - Science for all by Arnold G3PTB. Mike G4EOL. (01603) 789792.

NORTH YORKSHIRE

Hambleton ARS: All meetings held at Allertonshire School, Northallerton, 7.30 to 9.30pm. March 6 - Operating night, 20th - Construction event. More details from John G0VXH on (01845) 537547.

NOTTINGHAMSHIRE

Mansfield ARS: 2nd Mondays, 7.30pm. Novices particularly welcome. March 10 - Islands on the air, Ken G3OCA will be talking about this interesting aspect of amateur radio. David Peat G0RDP on (01623) 631931.

South Notts ARC: Wednesdays, 7pm. Meetings held (in term time) at Fairham Community College, Farnborough Road, Clifton Estate, Nottingham. Julie Brown G0SOU. (01509) 672734.

SOMERSET

Yeovil ARC: Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. February 27 - Club station on the air and committee meeting, March 6 - Site selection for v.h.f. by G3GC, 13th - Direct digital synthesis by G7SDD, 20th - Adjudication of club constructors contest, 27th - Club station on the air and committee meeting. Malcolm Sadler on (01460) 54657

WARWICKSHIRE

Mid-Warwickshire ARS: 2nd & 4th Tuesdays, 8pm. St Johns HQ, Warwick Div., 61 Emscote Road, Warwick. March 11 - Surplus and magazine sale, 25th - Natter night. G8HRI on (01926) 424465.

Stratford-upon-Avon & DRS: 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. March 10 - Antennas by Terry Russell G3JFH, 24th - Surplus equipment sale. The Society are again arganising a course of instruction for the Radio Amateur Examination of the City & Guilds of London Institute and further details can be obtained by writing to the Chairman of the Society, Mr J. Harris G8HJS, enclosing a stamped addressed envelope. The address to write to is: 57 Evesham Road, Stratford upon Avon, Warks CV31 2PB.

WEST SUSSEX

Worthing & DARC: Wednesdays, 7.30 for 8pm. The Parish Hall, South Street, Lancing. March 6 - Short talk and discussion, 13th - Information super highway by G7PIW, 27th - The Internet by G7OIR. Roy G4GPX. (01903) 753893.

WEST YORKSHIRE

Wakefield & DRS: Tuesdays, 8pm. The Ossett Community Centre, Praspect Road, Ossett. March 4 - Visit to West Yorks Police Control Room, 11th - On the air, 18th - The Great Egg Race, 25th - Visit to Police Helicopter. Bob 0113-282 5519 or G3WWF@GB7WRG.

Trowbridge & DARC: 1st & 3rd Wednesdays, 8pm. The Southwick Village Hall, Southwick, Trowbridge. March 5 - Surplus equipment sale, 19th - Natter night. Ian G0GRI on (01225) 864698.

Editorial

This issue is a milestone in the history of *Short Wave Magazine*. Sixty years ago a new magazine was launched with the following statement from the founding Editor, Basil Wardman: "Our policy will be directed to interesting and informing everyone who listens to short-wave radio. The family owning or intending to own an 'all-wave' set, will find exclusive programmes of short-wave broadcasts, useful and expert tips on getting best results, news of broadcast 'stars', tests of new sets, and many other features. The keen amateurs and experimenters will find first-class articles on new apparatus, construction, technique, and news of short-wave clubs and societies."

The first issue carried a page headed "LISTEN TO Liners, Cops and Aeroplanes, between 10 and 160 metres", a constructional article on a one-valve receiver and discussions on receivers and aerials. For your 6d (2.5p) you got 40 pages plus covers, with 12 of them being advertisements. Now you get more than twice the number of pages, each of which is 1.4 times the area - a total of three times as much for £2.50. In 1937 a pint of bitter would have cost you 3p, so today's pint of bitter is 60 times the 1937 price. This would make the equivalent price of the first *SWM* £4.50!

Under the editorship of Austin Forsyth G6FO, *SWM* was the magazine for the licensed radio amateur, leading the way in such technical matters as transistors - even going as far as showing readers how to make their own!

Next month is the tenth anniversary of the rebirth of *SWM* as a magazine aimed at "interesting and informing everyone who listens to radio as a hobby." It's amazing how things go full circle!

Dick Ganderton G8VFH

Letters

The Editor reserves the right to shorten any letters for publication but will try not to alter their sense. Letters must be original and not have been submitted to any other magazines. **The views expressed in letters published in this magazine are not necessarily those of *Short Wave Magazine*.**

Dear Sir

We can all find many things to complain about, but on this occasion I want to praise. I am a disabled person, using a wheelchair, and have recently taken up short wave radio listening. But, because my disability includes a loss of agility in my hands and fingers, the whole project had to be carefully considered in order to ensure that I could successfully operate the equipment.

To this end, I contacted Mr Bob Burrows, proprietor of the Short Wave Shop in Christchurch, who has been more helpful than I could ever have hoped for. He has been to my home on no less than six occasions, setting-up and showing me how to operate equipment on a loan basis, including a long wire antenna, all in his own time after shop hours.

I know he hoped eventually to make a sale, after all, that's why he is in business, but for someone in my position, this kind of service is priceless, and I wish Bob every possible success.

Now, to finish with a small grouse, if only those who have an amateur licence to transmit would state their location after their callsign, when leaving the airwaves, it would greatly assist those of us who listen to log those on air. Hoping you will find space to publish this letter.

PS. The *Short Wave Magazine* is great!

W. G. Boots
Christchurch
Dorset

Dear Sir,

On page 39 of the February issue of *Short Wave Magazine* I feel Brian Berry adds to the confusion regarding 'bits and baud' rather than resolving it. He is quite correct to say that Baud rate is a measure of the signalling rate of a system.

However, what he then says is very confused. If a signal represents a single bit, as it does in FSK or PSK, then the bit rate and baud rate are the same. However, if we use a signal to represent two bits, as in QPSK (four-phase signals), or three bits, as in QAM (eight-phase/amplitude signals), then the relationship is different.

For QPSK the bit rate is twice the baud rate and for QAM it is three times the baud rate. As the baud rate of a band limited channel is essentially fixed, we have to use these multi-bit signalling schemes to achieve higher bit rates. Maybe you could consider a longer piece along the lines of the above to really clear up the confusion.

Mike Ferriday

Mike, you are indeed quite correct. What we omitted to do was actually qualify the statement in the box to say that it related to FSK. Thanks for raising this important point. - ***KN***

Dear Sir

Re: the article by Ray Loveland in December *SWM* on valved sets. No, Ray, it is not impossible to construct 465kHz i.f.s, We have done it, the ones they called Hams. I am past the sell-by-date with crippled hands, but I could still do it and do the job properly by adding variable selectivity.

The trouble with today's amateurs, note I did not say Hams, is that they spend too much time on the black box and not enough on finding out how radio works, or do they just want to 'chiter' like a lot of old Hams.

Jim Ex GI2
Belfast

Jim, I hope that you have got your fireproof jacket on. I have just spent the weekend in Lisburn with the new RSGB President and I know that he believes fervently in the self-training aspect of amateur radio. ***Ed.***

Dear Sir

In the January 1997 issue of your magazine, you very kindly published my letter asking for readers memories on the German wartime broadcaster, Wm Joyce ("Lord Haw Haw"). May I take this opportunity to thank you for publishing my letter and your readers who replied to my request for the invaluable information that they have sent to me.

The response was terrific. The letters in some cases said, 'You are probably well aware of this book or that information', I wasn't! Wm Joyce was before my time, so all the information I received was very beneficial. I received replies from as far afield as Bordeaux, France.

My project is now under way, through your readers I now have many lines of research to follow. To receive help such as that given by you, by printing my letter, your readers for taking the time and expense to write to me, not only makes the project more interesting, it makes it more worthwhile knowing that a complete stranger is willing to go out of their way to help someone else.

Once again, many thanks.

Derek Denton
Oldham
Lancashire

This just shows how far afield SWM gets. It is also indicative of the nature of a SWM reader. ***Ed.***

Dear Sir

After a space of 27 years I have gone back to being a s.w.l. and regularly buy the *SWM* each month. I have a Panasonic 11-band communications receiver, model no DR49 RF-4900 LBE and I would like to find out more about it.

I have the operating instructions, but seek more information and a circuit diagram. I have written to Panasonic UK and they have no knowledge of it at all and no information. Is there anybody out there who has one and can give any information or advice, it would be much appreciated.

I was greatly interested in your article on the old HAC kit radios. I have one which I bought for my son to build 30 years ago. It is a 2-valve version using Tungsram LD2 valves and three Denco Green Octal plug-in coils from 9-170 metres. I would like to transistorise it, or am I ruining a collectors item? Can I get a circuit diagram using the existing components possibly from C.M. Lindars himself?

I am in my 78th year and

have had a great interest in short wave radio all of my life. It started in my Army days, as I used to have to take my duty turn operating the 19 and 22 Sets that we used to have in the Second World War.

I will continue to buy *SWM* on a regular basis and I thank you in anticipation of your reply or publication of this letter.

Alfred Graham
Kingsbury
London

All right, SWM readers, can you help Alfred? As to transistorising a HAC valved receiver, I don't know about it being a collector's item, but it would certainly loose a lot of its appeal. Why not build a new transistorised version, but still using the original plug-in Denco coils? ***Ed.***

Dear Sir

Your reader I.G. Bennett (February '97 issue) asks if there is a solid-state rectifier to replace the GZ34 valve in the RA17L and if it would appear practicable to do so by wiring two 1N4007 diodes across the GZ34 valve base. However, the GZ34 is an indirectly heated rectifier with a longer 'warm up' time than the remaining valves in the RA17, which then present a load to the h.t., reducing it to the required value.

A solid-state rectifier produces a peak voltage h.t. almost immediately on switch on, probably with detrimental results to the smoothing electrolytics and other components. (Note, the American version of the RA17L does use solid state rectification, but apart from their own range of valve equivalents, may also have an h.t. delay).

The GZ34/CV1377 valve is still available at a reasonable price and often seen at rallies, is normally long lasting and should not be replaced by a directly heated one ,or the same problem as that with solid-state rectifiers can occur. This also applies to the RA17 Mkl/II, which often have a GZ33/CV378 rectifier (where the GZ34 may be used as a replacement), or any other of the older valve RXs, which have an indirectly heated valve.

As previous letters indicate, there are a considerable number of RA17 add-ons, noticeably the v.l.f. converter, s.s.b. and PAN adapters, some appearing at rallies, but unfortunately, not so often nowadays. However, the RA17 has a useful facet in the 10kHz i.f. output being readily available to which, with care, may be attached experimental equipment. To this outlet I have added a reworked ex-MOD s.s.b. unit and a home-brew n.b.f.m. adapter. A v.l.f. up-converter to 10MHz, a 2m down-converter to 28/30MHz and a tuneable v.h.f. down-converter to 21.4MHz extends the coverage.

The Racal Diversity Gate, also found at rallies, is fed from the 100kHz i.f. outlet and apart from its primary mode is useful for its self contained b.f.o. and signal detectors allowing the RA17L to be used with a.g.c. on on/off keyed signals and good resolution of s.s.b. signals, FAX and other data signals on the Delivery Gate.

N. L. Smith
Stoke-on-Trent
Staffs

Dear Sir

As a new reader to *SWM* I must thank you for a well informative publication at an affordable price to those on a low income. Please keep up the good work!

I was wondering if your 'Letters' page might be appropriate for helping me with a quest which I have been on for over two years. I am trying to obtain either a picture or actual unit of a dry 279/U or 289/U battery, which I believe was used by the MOD in the 1950s. I collect radio and telephone equipment from the military and I have a battery tester for these batteries and wish to display it with an original battery.

I hope there is a reader out there that can help me.

D. Stansfield
Norwich

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.
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Dear Sir

I wonder how many of your current readers were around when the *Short Wave Magazine* was first published? Was it 1937 or thereabouts?

From its inception, I was an avid reader. The enclosed picture was published in the magazine, I believe in August or September of 1938, showing me in my little shack along with what was standard in those days, a home-made 3-valve receiver. I must confess I look a little older now, but maintain an interest in our fine hobby.

The magazine has changed quite a lot since the late 30s, but still provides a lot of fine features for young and old alike! So, how far back do some other readers go? Might be fun to find out!

Mr J. Hunt
G2FSR (since 1938)
Brighton

Indeed, Mr. Hunt, the first issue of SWM was published exactly 60 years ago - March 1937. Any other readers out there who have been readers since issue one? ***Ed.***

SWM SERVICES

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Subscriptions are available at £25 per annum to UK addresses, £30 in Europe and £32 (Airsaver), £37 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £45 (UK) £54 (Europe) and £58 (rest of world).

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In general all components used in constructing *SWM* projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article.

The printed circuit boards for *SWM* projects are available from the *SWM* PCB Service, Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. Tel: (0956) 374918 (Mon. - Fri. 9am - 5.30pm).

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We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. If you require help with problems relating to topics covered by *SWM*, please write to the Editorial Offices, we will do our best to help and reply by mail.

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Gain on the Cheap VHF/UHF Scanner Band Antenna

Joseph J. Carr discovered by accident that an h.f. long wire antenna can work very well on v.h.f. and above. In this article he explains why.

One night many years ago, a friend of mine and I were operating his amateur radio station. We were using a Gonset Communicator III on the 144MHz amateur band. That single channel, crystal controlled transceiver put out all of 6 or 7W, so we normally loaded it into an 11-element, 144MHz Yagi beam antenna. Lots of gain, and good signal reports, resulted. But this one night we were getting exciting signal reports, seemingly much better than usual, with no propagation anomalies to explain it.

After about two hours, I noticed that (being unfamiliar with another fellow's shack) I'd made a mistake connecting the antenna to the 144MHz transmitter. Instead of the 144MHz beam, I'd connected the coaxial cable from an 3.5 - 28MHz (80-10m) trap dipole. For about an hour we compared received signal strengths (as read on the 'S'-meter) by transfering back and forth between the Yagi and the trap dipole. As a couple of newcomers to amateur radio, neither of us knew why it worked so well, but my mentor, Mac Parker W4II, explained it: on 144MHz the 40.2m trap dipole was acting like a 20 wavelength long-wire antenna, which produces a gain between 15 and 20dB.

It wasn't too many years later that I ran across another long-wire application at v.h.f. David was a fellow electronics technician working in a shop with me. He came from West Virginia, and in the late 1950s you had to be either clever or rich to get good TV signals in his hometown. And it wasn't because the signal was blocked by West Virginia's well-known mountains, for he had a 'clear shot'. The problem was one of distance - he was a long way from the nearest TV station. It operated on a frequency around 174MHz, but produced only a very noisy, unwatchable signal at David's home. So, being a resourceful technical type, he rigged up a cheap wire Vee-beam that was approxim-ately 21m long on each leg, which produced a gain between 13 and 15dB!

Those two events early in my electronics career gave me a healthy respect for wire antennas operated in the v.h.f. and u.h.f. bands. The same techniques that worked on those antennas will also work for scanner receiver operators. These methods are ways of getting gain on the cheap.

Long-Wire Antennas

One form of the basic long-wire antenna is shown in **Fig. 1**. By definition, the radiator element must be greater than two wavelengths (≥2λ) (**Fig. 1**). At first glance, the long-wire looks a bit like the end-fed, ground referenced, random length Marconi antenna, but the resemblance is superficial. For long-wires greater than about three wavelengths, the antenna is actually of the Hertzian form

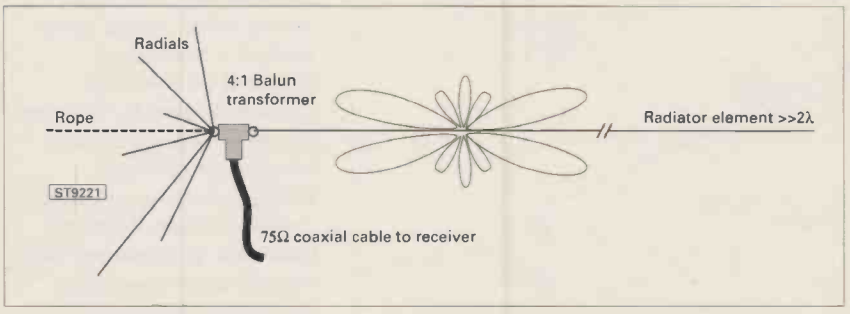

Fig. 1: The basic resonant (unterminated) long-wire antenna.

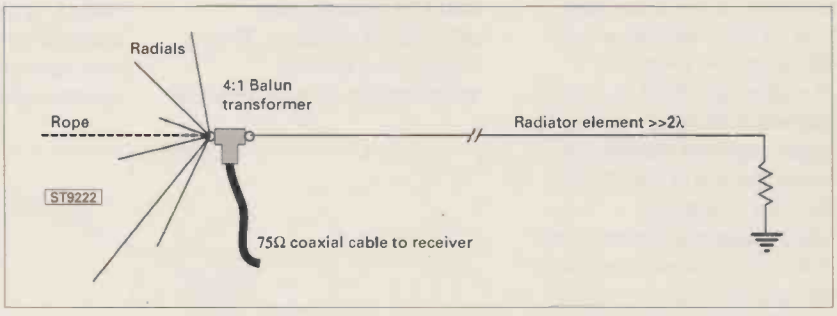

Fig. 2: The non-resonant, terminated long-wire.

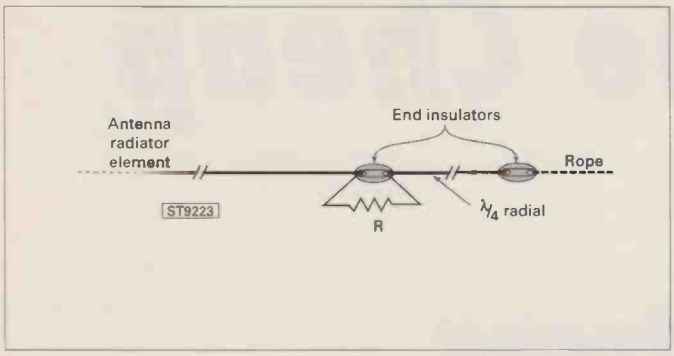

Fig. 3: Method of using a counterpoise ground with the terminating resistor.

because it is basically a number of half-wavelength dipole antennas connected in series.

This version of the long-wire antenna is called a 'standing wave' antenna because it is not terminated on the far end. Waves can traverse the wire in either direction. When they reach the unterminated end, they reflect back towards the feedpoint. When the forward and reflected waves interact, they form the usual standing wave pattern.

The traditional long-wire antenna is fed by open-wire, parallel transmission line, 450Ω twin-lead or some other form of parallel line. In the version of **Fig. 1**, however, the antenna is fed from 75Ω coaxial transmission line through a 4:1 BALUN transformer. This is a more reasonable feed method for most receiver operators, even though it results in a bit of a mismatch. Unfortunately, if you utter the demon word 'v.s.w.r.' people shudder in dread, but the effects of v.s.w.r. on most receiver systems is not as great as one might think. I once made a series of v.s.w.r. loss calculations in my job, and was shocked at how low the worst case scenarios were, even up to about 2.5:1. The losses are real, but not too terrible. It is, therefore, reasonable to use a v.s.w.r.-antenna if it provides other benefits.

The BALUN transformer used with the v.h.f./u.h.f. long-wire should be designed for v.h.f. use. Although I've seen special v.h.f./u.h.f. 50Ω BALUNs offered in catalogues, it is a lot easier to obtain 300:75Ω BALUNs from television parts distributors. These transformers are designed to be hooked onto the antenna terminals of a television not designed for coaxial cable. Again, the loss inherent in a 75/50Ω mismatch is not tremendous.

In order to make the antenna work with the BALUN transformer, it is necessary to use at least one radial per frequency band at the other end of the BALUN transformer secondary winding. These radials are quarter wavelength, so the physical length can be found from L = 75/F, where the length (L) is in metres and the frequency (F) is in MHz. Radials from a number of bands can be connected to the same point, as shown in **Fig. 1**, forming a radial 'spider'. The resonant long-wire is resonant on a number of frequencies, and each band should have its own radial.

The version of the long-wire shown in **Fig. 1** is called a 'resonant long-wire'. Even though it is resonant, the performance does not change very rapidly with changes in frequency, provided that the length is greater than three wavelengths. On antennas less than three wavelengths, the angle of radiation and reception changes sharply with frequency.

Given that wavelengths at v.h.f./u.h.f. frequencies are short, obtaining space for multiple wavelengths is not too difficult. For example, at 150MHz, λ is 2m, so a 3λ antenna is only 6m long. At 500MHz, the situation is even better - 3λ is only 1.8m long. These relative sizes make it very easy to obtain lengths out to ten or twelve wavelengths at v.h.f./u.h.f. frequencies.

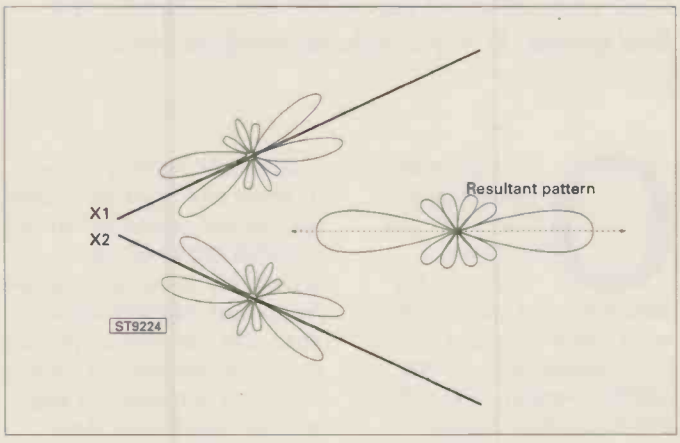

Fig. 4: The basic resonant Vee-beam antenna.

The resonant length of a long-wire antenna is found from:

L = 300 (N-0.025)/F

Where the length (L) is in metres, the frequency F is in megahertz, and N is the integer number of wavelengths desired for the length of the proposed antenna.

The resonant long-wire antenna will, according to the equation above, work well on a number of different frequencies (corresponding to different values of N for the same length, but different frequencies). At odd integer quarter wavelengths, the long-wire antenna becomes heavily capacitive, so is somewhat less useful.

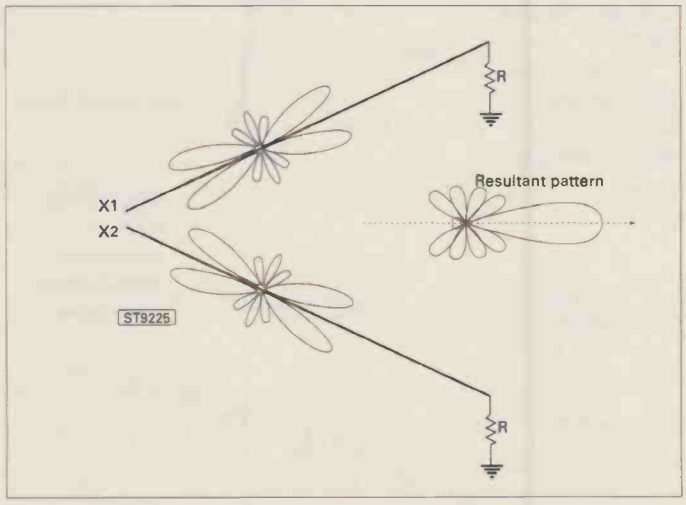

Fig. 5: The non-resonant Vee-beam antenna.

20 ▶

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▶16

Non-resonant Long-Wire

The long-wire antenna can be made nonresonant, yet still offer substantial gain, by the simple addition of a terminating resistor at the far end (**Fig. 2**). The terminating resistor should match the characteristic impedance of the long-wire, which is typically 300 to 800Ω (for receiver use, a trial value of 560 or 680Ω would probably provide sufficient). For receiver applications only, the terminating resistor can be a 1 or 2W carbon composition or metal film resistor. It's important that the resistor be non-inductive, so don't use any wire-wound resistors for this job.

Did anyone notice anything wierd in **Fig. 2**? The cold end of the resistor is earthed. That means a wire must be dropped from the antenna, which is presumedly at some height above the ground, to an earth connection. That wire is bound to be many wavelengths at v.h.f./u.h.f. frequencies, so is likely to be about as effective as earthing it in a block of wood. It's even difficult to make the connection on h.f. long-wires, let alone v.h.f./u.h.f. antennas. But there is a solution shown in **Fig. 3**: connect the resistor between the far end of the long-wire and a quarter wavelength radial. The radial acts as a counterpoise ground, and can be connected directly to the

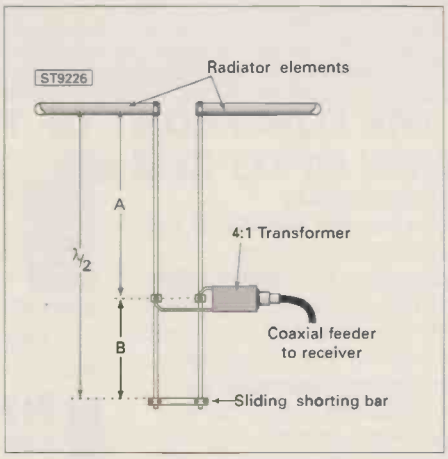

Fig. 6: Matching stub.

resistor. For multi-band use, connect a radial spider such used as the feed end of the long-wire (**Figs. 1 & 2**).

The gain of the long-wire rises nearly linearly with length relative to a wavelength, although the directivity angles changes in a non-linear manner. For the 2λ long-wire, there will be four main lobes positioned at angles of ±36°, with the gain dropping -5dB at 75°. At 5λ, the angle of the main lobes squeezes in to ±22°. The squeezing of the lobes towards the axis of the wire increases as the length gets longer, converging to a bi-directional antenna at 20λ or so. The following rules apply:

1. On each side of the antenna there will be at least one lobe for every half wavelength of wire length. For the entire antenna, including both sides, there is one lobe, either major or minor, for each quarter wavelength of wire length.

2. Symmetry is maintained if there is an even number of lobes on either side of the antenna; half the lobes are tilted forward, and half tilted backwards.

3. If the long-wire is asymmetrical, then one lobe on either side will be perpendicular to the wire, and all other lobes will be distributed on either side of the perpendicular lobe.

Long-Wire Vee-beams

If two long-wire antennas are formed into a 'vee' configuration (**Fig. 4**), and fed 180° out of phase with each other (accomplished by feeding them from different conductors of the transmission line), then the patterns of the two antenna elements will interact to form a bi-directional or uni-directional resultant pattern (inset to **Fig. 4**). If the antenna elements are un-terminated (**Fig. 4**), then the pattern is bi-directional, but if the non-resonant terminated version is built, then the pattern becomes uni-directional (**Fig. 5**).

The non-resonant form uses terminating resistors in the same manner as the non-resonant long-wire. Again, practical considerations at v.h.f./u.h.f. force the use of a counterpoise ground consisting of a radial system (refer again to **Fig. 3**).

Performance

The performance of the antenna depends partially on the length of the elements, and partially on the included angle between the elements. In most practical situations an included angle of 35 to 90° is used, with 60 to 70° being very common.

The Vee-beam is usually fed with 600Ω parallel open-wire line, which is connected to an antenna tuning unit. A 4:1 BALUN would result in a bit of a mismatch that could probably be ignored in receiver installations. It's also possible to use a 9:1 BALUN transformer for the task. Although I haven't seen any v.h.f./u.h.f. 9:1 BALUNs on sale, one could make their own following instructions found in most radio antenna books.

If you want to use the antenna over a single frequency band, then a matching section can be used with the antenna (or any of the antennas discussed in this article, for that matter). **Fig. 6** shows the basic concept. A length of 600Ω parallel transmission line is cut to a bit more than half wavelength. A shorting bar at the bottom end is used to adjust the stub to a particular frequency. The coaxial cable is connected across the stub, through a 4:1 BALUN transformer, at a point that gives a good match. One can also sometimes use a 1:1 BALUN transformer (although the connection point is different), but those are harder to come by in v.h.f/u.h.f. models. One could, of course, build their own, but with 4:1 TV-style units so easily available I'm not sure it makes much sense.

An additional 3dB of gain, and more control over directivity in the case of the non-resonant Vee-beam, is obtained by stacking two antennas quarter wavelength apart. **Fig. 8** shows the arrangement from a perspective above the antennas. Recognise anything? About sixty

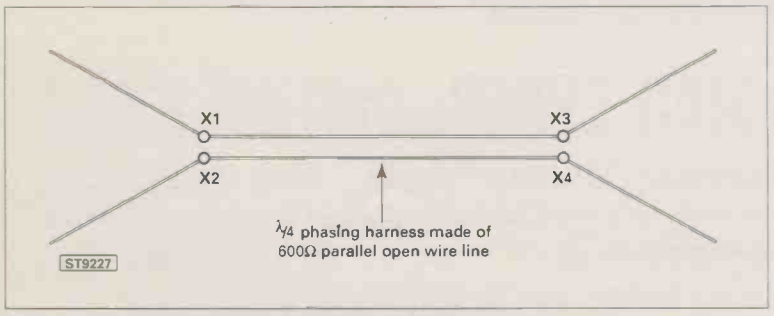

Fig. 7 Stacking Vee-beams gives 3dB more gain.

quintillion TV antennas were built this way! The feedpoints of the two Vee-beams (X1, X2 and X3, X4) are connected togther through a quarter wavelength phasing harness made of 600Ω parallel line.

The directivity of this antenna is controlled by where the feedline is attached: the maxima lobe is always in the direction opposite the feedpoint. For example, when the antenna is fed at X1, X2, the maxima is toward the X3, X4 end of the array. To reverse the directivity, connect the feedline to X3, X4.

Ultimate

Perhaps the ultimate in wire antennas for v.h.f./u.h.f. is the rhombic (**Figs. 8 & 9**). The rhombic antenna shown in **Fig. 8** is the resonant or un-terminated form, while that in **Fig. 9** is the non-resonated, terminated version. The gain of the non-terminated version is about the same as for a Vee-beam of similar dimensions, while the terminated version has a gain a bit higher. These antennas work nicely over about an octave of tuning range.

The rhombic gets its name from the shape, i.e. it is a rhombus (diamond) shape. There are two angles in each side of the rhombic: the tilt angle is the large angle in each half of the antenna, while the apex angle is the angle between the two halves (e.g. at the feedpoint). A common form of rhombic is to use legs of six wavelengths (6λ) each, or 12λ overall, with a tilt angle of 70° between the legs of each side. This is the form of antenna that my friend David showed me in West Virginia many years ago (today, by the way, West Virginians have universal access to television service, and don't need to resort to such antennas, although many of them opt for TVRO satellite dishes rather than local service; There are so many TVRO units in West Virginia that we residents of the Virginia side of the border refer to the standard white satellite TV dish as the 'West Virginia state flower').

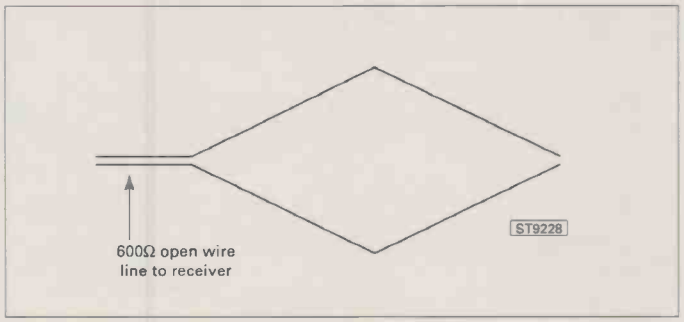

Fig. 8 Resonant rhombic antenna.

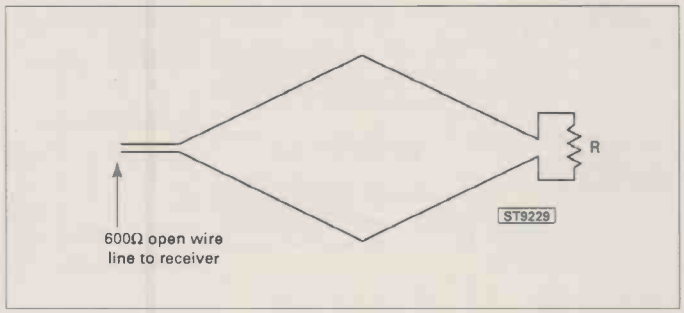

Fig. 9 Non-resonant rhombic antenna.

Half-Rhombic Antenna

The half-rhombic antenna is shown in **Fig. 10**. It's a bit different than some of those discussed so far. Although it looks much like a Vee-beam turned on its side, it's really more rhombic-like. The missing other half of the diamond is a 'virtual' radiator mirrored in the ground (I know that sounds flakey, but that's what the engineering textbooks say).

The half-rhombic is made using a mast to support the centre, with the two halves being symmetrical (i.e. the mast supports the centreof the wire). The angle formed between the legs should be greater than 90°, but 120° to 145° is more commonly seen. The terminating resistor should have a value between 600 and 850Ω (the optimum value can be found experimentally). The feedpoint is fed with 600Ω parallel line, but the use of a stub or 9:1 BALUN transformer should reduce that to a level that 52 or 75Ω coaxial cable can be accommodated.

Several of these antennas use 600Ω parallel transmission line either to feed the antenna, as a matching stub, or as a phasing harness. This line can be purchased from electronic distributors, or home made. Instructions are given in my book *Practical Antenna Handbook - 2nd Edition*, (Available from the *SWM* Book Store) and in many other books on antennas. ■

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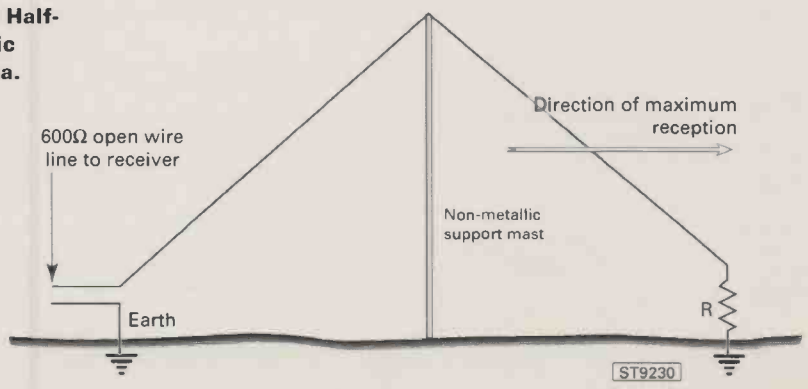
Fig. 10 Half-rhombic antenna.



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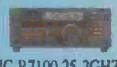

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Front panel of the CR100/2 variant.

The CR100 Receiver Revisited

Ben Nock continues his trawl through the historical classic receivers.

The CR100 Navy receiver, also known as the B28, is perhaps one of the best known receivers of the Second World War. Many amateurs and short wave listeners have used and loved these sets from early days. I myself had one of these sets as the first foray into the world of radio communication and am always pleased to see one nowadays, although a little less able to carry one for any distance. In the CR100 range there are CR100, CR100/2, CR100/4 and CR100/5 versions.

The 11-valve, 6-band set weighs in at 82lbs, not the sort of thing to balance on the old MFI. Its dimensions of 16 by 16 by 12in also limit it in many of todays 'under the stairs' shacks. Many folk are put off these sets by the size and weight, which is rather a shame given the performance these sets can deliver. **Fig. 1** shows the various controls and locations.

The quoted sensitivity for 20dB S/N on c.w. of 1 to 2µV between 60kHz to 11MHz and 1.5 to 4µV between 11 to 30MHz, along with variable selectivity of down to 100Hz, makes the set very usable on c.w. in todays crowded bands. It must be said though that to achieve the best performance from these type of sets the operator really has to know how to 'drive' the receiver. Adjustment of selectivity, r.f. gain, b.f.o. pitch, Manual or Auto a.v.c. and even the antenna trimmer all have to be at optimum to fully obtain the best results. All this takes time and patience, Operator attributes that have either been lost or never learned in todays world of 'switch on and go' radio.

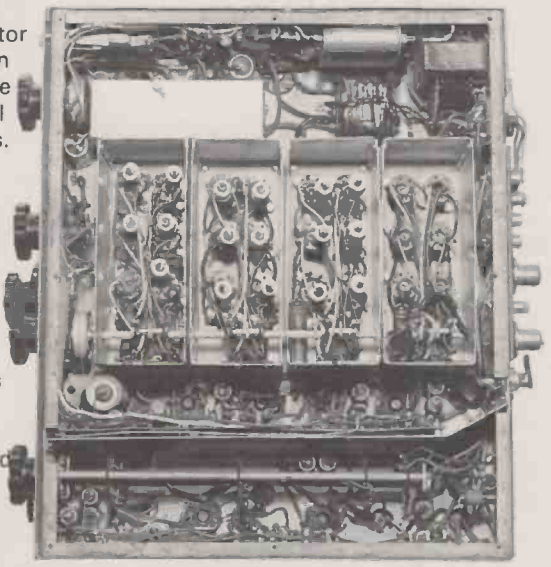
Valve Line-up

Table 1 shows the valve compliment along with its use, service number and equivalents. The manual states that the equivalents should only be used in an emergency (shades of *The Radio Ham*, Hancock).

Circuit Arrangement

The two stages of r.f. amplification, employing variable-µ valves, are used ahead of the mixer stage, a triode hexode type valve with the triode section being unused. A separate valve is used as the local oscillator operating on the high side of the signal on all bands. The mixer output of 465kHz (±2kHz) is applied to the i.f. strip employing a further three valves with variable coupling and a crystal filter used to provide the various bandwidths. Valve eight operates as the a.f. detector, the a.v.c. detector and the first a.f. amplifier, feeding the recovered audio to the output valve, V9.

The antenna feed arrangements are different for the various sets. In the case of the CR100 and CR100/4 receivers the input is suitable for a balanced feed if desired, there being two terminals marked 'D' on the rear apron. For the types CR100/2 and CR100/5 receivers one end of the internal coupling coil is earth and the other connected to a coaxial socket marked 'D' on the rear panel, the coupling is designed to present an impedance of approximately 100Ω on all bands. The antenna socket marked 'A' is a high impedance feed, suitable for a random length of wire.



They don't build 'em like this any more. The underside wiring of the CR100/2.

Pass Band Adjustments

Once the wanted signal has been found the operator can adjust the width of the i.f. amplifier stages by altering the 'Pass Band' switch. A very slight and careful adjustment of the tuning may be required as the pass band is narrowed. The possible settings are:

6kHz - Best for speech, makes tuning broader, poor for QRM.

3kHz - Less background noise, better for s.s.b. and crowded conditions.

1.2kHz - Use on bands four to six, not good for speech.

300Hz - Used on c.w., chiefly on bands one to four, just usable on band five.

100Hz - Great care in tuning and b.f.o. pitch needed.

The narrowest pass band is only suited for a signal of good stability and slow signalling speeds. When receiving c.w. on broad pass bands and tuning through zero beat it will be found that the signal is equally strong on both sides, but on the narrower pass band setting one side will always be stronger than the other.

On c.w. the a.v.c. is given a longer recovery time constant, this will tend to broaden the apparent selectivity when searching through strong signals, and thus make tuning slower. To switch the a.v.c. off select the 'MAN' position of the operation switch.

Table 1. Valve compliment of the CR100 receiver.

Valve	Type	Use	Service	Equip.
V1	KTW62	1st r.f. amplifier	VR100	6K7G, 6J7G
V2	KTW62	2nd r.f. amplifier		
V3	X66	Mixer	VR99	6K8G
V4	KTW62	Local Oscillator		
V5	KTW62	1st i.f. amplifier		
V6	KTW62	2nd i.f. amplifier		
V7	KTW62	3rd i.f. amplifier		
V8	DH63	Detector/a.v.c./ a.f. amp.	NR68	6Q7G
V9	KT63	a.f. output	ARP17	6F6G, 6V6G
V10	KTW62	b.f.o.		
V11	U50	Full wave rectifier	NU20	5Y3G, 5Z4G

Lid up, showing the Operator and Servicing Notes.

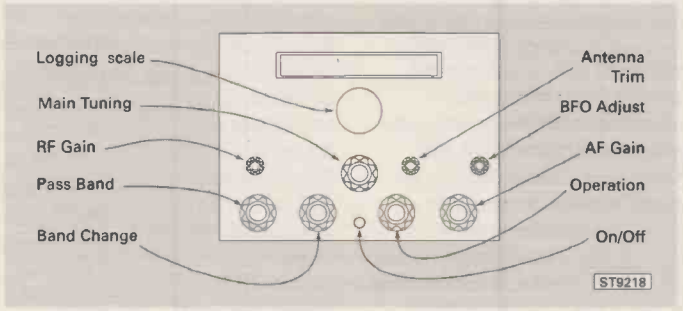


Fig. 1: Control Locations.

Power Supply

The set has a built-in power supply running on 200 to 240V a.c. The 5-pin socket on the rear panel is used to supply the a.c. mains and to take off an l.t. and h.t. feed to other equipment. The same socket can also be used to supply the set from a mobile power supply. A rotary d.c. to d.c. converter, an Elect. Dyn. Con. WS1571, 6V input, 190V 80mA output, is used to supply the h.t. An internal link, located inside the upper half of the chassis just in front of the mains transformer, has to be adjusted between a.c. heaters and d.c. heaters if used.

Side Tone

On the CR100/2 version there is provision for desensitising the receiver during use with a transmitter and using it for side tone monitoring. A 2-pin plug on the rear panel allows for the connection of a relay contact in the transmitter which opens on transmit. This introduces a variable resistor into the earth side of the r.f. gain potentiometer. The variable resistor is located on the top deck inside the receiver and the operator should adjust this potentiometer so as to hear his own transmissions at a suitable level. When not being used a shorting link should be inserted in the two pin socket.

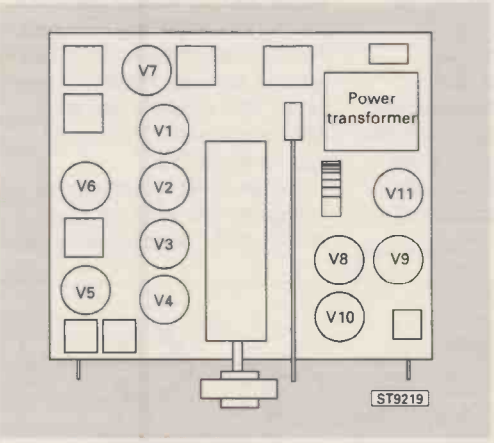


Fig. 2: Valve identities.

Mechanical Matters

The receiver cabinet is of an all metal construction, 1/16in motor body steel, comprising four sections, chassis, cover with hinged lid, front panel and bottom plate.

The front panel is secured to the chassis by 'Parker Kalon' self-tapping screws, which are also used elsewhere on the set.

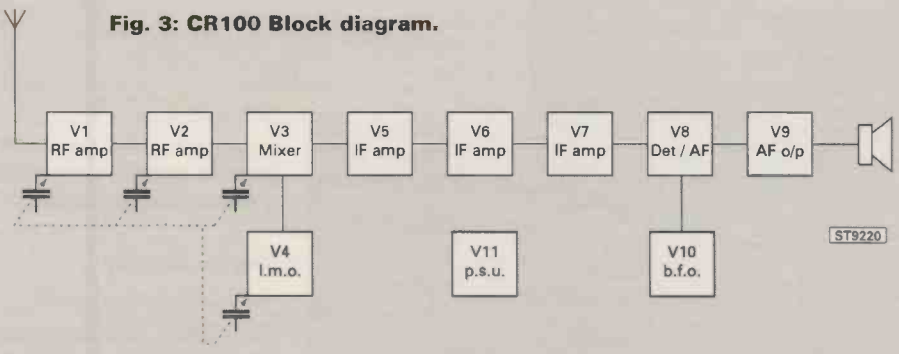
To remove the front panel from the chassis, first remove all the knobs and the locking ring around the mains on/off switch. Removal of the screws will then enable the front panel to be removed for re-painting and so on.

The main cover is also simply screwed to the chassis and can be removed for restoration or cleaning. The base plate has pressed domes on which the set sits if table mounted. There are ventilation holes in the base to allow a cooling air flow. This plate can be reversed for rack mounting the set.

Tuning The Bands

As a general communications set, a correctly aligned CR100 takes a lot of beating on performance. Tuning the crowded amateur bands is quite simple with the variable bandwidth and the good slow motion drive. On c.w., with a narrow bandwidth and a good pair of 'phones, many interesting stations and even new countries can be prised out of the noise. The set does have the drawback of size and weight but, if these can be put up with, this set is a worthy addition to any shack. Another interesting point, as the set is nice and square, and strong, it can be used to prop up the shack table should it get overloaded. ■

Fig. 3: CR100 Block diagram.



Power Supply for a One-valve Receiver

Building the Simple One-valve Receiver? Dick Ganderton offers some ideas for a battery eliminator.

The simple one-valve receiver featured in the December '96 issue of *SWM* was originally designed to run from dry batteries. High voltage batteries are difficult to obtain nowadays and a simple mains power supply is a much better option. However, if you do want to run your set from batteries this can be achieved by connecting ten PP3 9V batteries in series to give the nominal 90V h.t. required. To do this you will need ten PP3 battery clips and some means of connecting the leads together. One suggestion is a piece of Veroboard 12 tracks wide by 4 holes long. This will enable you to connect the 1.5V battery for the heaters as well.

The term given to a separate mains power supply to replace the costly btteries was 'battery eliminator' and in the days when valves reigned supreme it was a simple matter to build one, as suitable high voltage mains transformers were readily available. Nowadays, mains transformers with centre-tapped secondries for use with full wave rectification and supplying the 126V or so from each half of the secondary are difficult to find.

To overcome the problem I am suggesting the simple power supply in **Fig. 1**. This is two 45V unregulated supplies connected in series to provide 90V with a regulated 1.5V supply for the heaters. Each 45V supply comprises a mains transformer with centre-tapped 15-0-15V secondaries giving 30V a.c. A bridge rectifier is used with a large reservoir capacitor to smooth the output voltage. With this set-up the d.c. output voltage is 1.41 x the a.c. input voltage. So, for 30V a.c. we will get 1.41 x 30 = 42.3V - assuming no losses. Two of these in series will give a total h.t. voltage of 84.6V. To get above 90V we could use 40-0-40V transformers. This would give us about 112V.

We can build up almost any voltage by just adding further individual d.c. supplies in series - remembering that the circuit, from the transformer secondary onward, must be isolated.

Heater Supply

The regulated supply for the 1.4V heaters uses a simple variable regulator integrated circuit, the LM317. This is arranged to give a fixed output voltage of 1.4V.

The output is selected by altering R1 according to the formula Vout = Vin (1+ (R1/R2)). With R2 set at 240Ω, R1 needs to be 48Ω to give an output of 1.5V and 29Ω to give 1.4V. A value of anywhere between 27Ω and say 33Ω will give a heater voltage of 1.39 to 1.42V. I would suggest using a 33Ω resistor to start with, measuring the voltage at the heater. If it is too high you can always change R1 for a lower value.

Construction

The unit can be built in any case that is capable of housing the three transformers and a small piece of Veroboard for the regulator circuit. The mains input should be fused and switched with a double pole switch as shown in **Fig. 1**. The type of fuse and holder and also the switch will depend on your taste and the style of case you use to house the unit.

■

You Will Need

Resistors

Carbon film, 5%, 1W		
33Ω	1	R1
Metal Film, 5%, 0.25W		
240Ω	1	R2

Capacitors

Ceramic disc		
0.1µF	1	C2
Electrolytic PCB type		
1000µF 16V	1	C1
1000µF 63V	2	C3, 4
Tantalum		
1µF 35V	1	C5

Semiconductors

Diodes		
1N4004	8	D1 - 8
Integrated circuits		
LM317T (Maplin AV30H)	1	IC1

Transformers

Miniature 250mA		
15-0-15V	2	T1, 2 (Maplin YN17T)
6-0-6V	1	T3 (Maplin YN14Q)

Miscellaneous

Case, Veroboard, Switch, 1A Fuse and holder, terminals (4), Mains lead and plug.

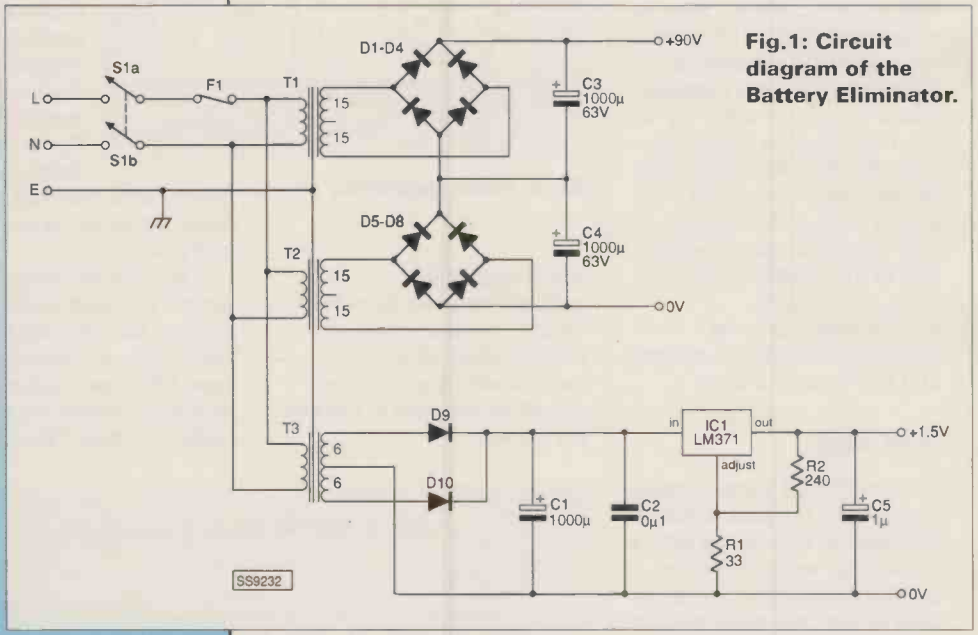


Fig.1: Circuit diagram of the Battery Eliminator.

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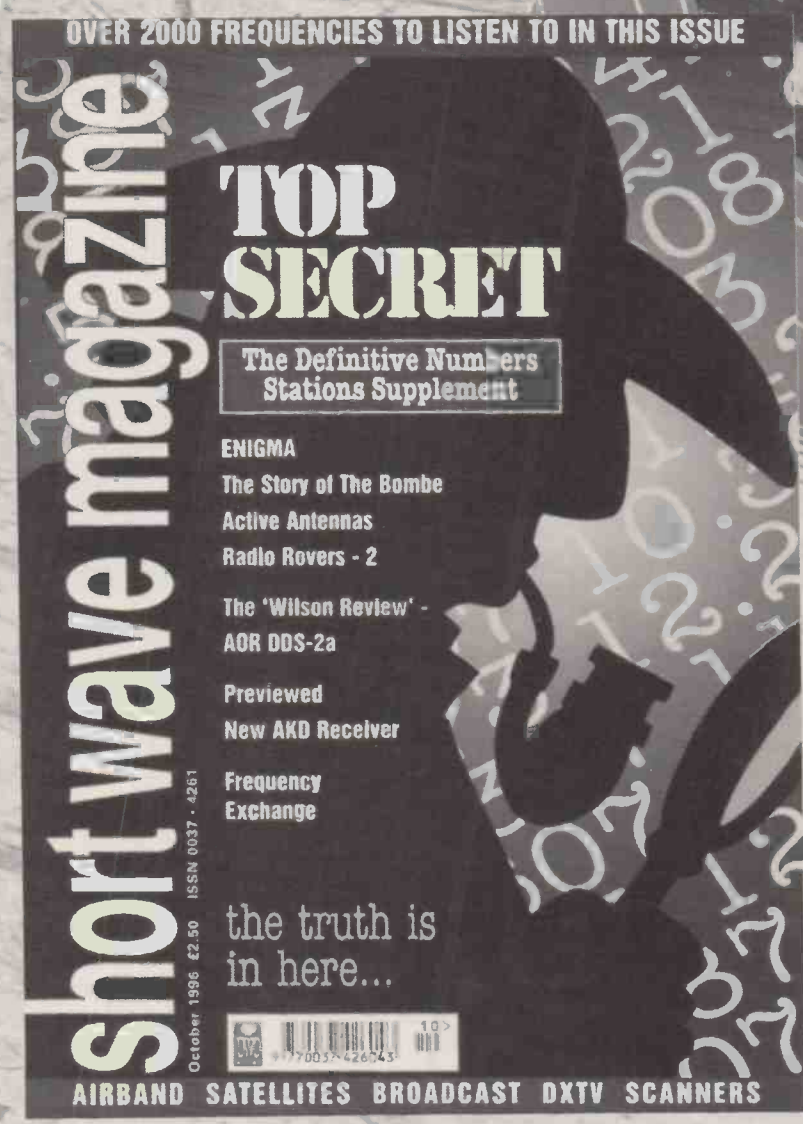
Welcome to our look back at the past 60 years of *Short Wave Magazine*.



Short Wave Magazine, March 1997

Memories of *Short Wave Magazine*

Our oldest remaining relic, Paul Essery reflects on the past sixty years of your favourite radio monthly.

I suppose I am the oldest remaining relic of *SWM*'s past! At least I can say I've actually seen a copy of that very first issue sixty years ago. The original begetter of *Short Wave Magazine* was Basil Wardman G5GQ, assisted by S. W. Clark.

By March 1938 we find Austin Forsyth G6FO had taken over, and he continued to be the Editor until his death many years later. When Hitler's War broke out in September 1939, 'Angus' and his small staff shut up shop 'for the duration' and like so many radio amateurs went into the Forces. By the end of it he was a Wing Commander Royal Air Force and had an OBE for his work in radar.

By March 1946, G6FO got out his first post-war issue. During the war both S W Clark 2AMW and regular contributor F A Beane 2CUB had been killed.

The RSGB announced the result of negotiations with the Post Office in March 1945. Within a couple of months Hitler and Mussolini were dead, and by August 14 Japan had surrendered.

For the sum of fourteen Guineas a reader of our first issue could have become the proud owner of a Pilot U.225 a.c./d.c. model. This six valve set covered 16 to 2140 metres in three wavebands.

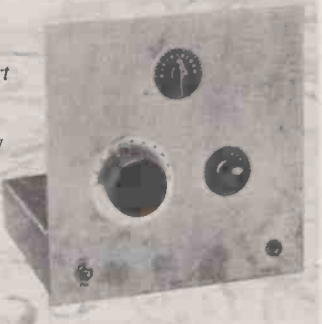
'For military reasons' we couldn't have our bands back, but after much RSGB pressing, the first post-War licences were issued in January 1946, giving 28-29 and 58.5-60MHz. A couple of months later the ten-metre chunk became 28-30MHz, and Top Band was released. July 1946 saw the first 'DX' bands - 7.150-7.300MHz and 14.100-14.300 - released. Within six weeks of the first licences, the total had reached 1600!

It was about this time that I got my training - a start with the P.O. Engineers, then a Radar course courtesy of REME, where I first became a regular *SWM* reader. My first licence was as G3KFE/T, - no Morse, before the B licence was invented!

Back to the post war *Short Wave Magazine*. G6FO was to have some very fine collaborators. Perhaps the the least-known of these was Geoff Watts - famous for *DX News Sheet*, and the *Prefix Lists*. Geoff compiled the 'New QTHs' column and other things too. Another was 'Tommy' Thomas MBE G6QB, who wrote the DX column under his own name, was 'Club Secretary' and later wrote the 'SWL column' which came along, if memory serves me right, in 1960. 'Tommy' was well-known as Howard Thomas, on the BBC Theatre Organ, often with Angus turning the pages. His MBE came for wartime radar work, too. Then there was the 'VHF Column', the province of E. J. 'Ted' Williams B,Sc G2XC for some years, until he gave up both column and callsign. A. J. Devon - G6FO in disguise - took it over again for many years. Later VHF columnists were Mike Dormer G3DAH and then Norman Fitch G3FPK.

For some post-war years there was a companion publication called *The Short Wave Listener* and *Television Review* and a few issues of a 96-page offering called *Radio Quarterly*.

At first the magazine offices and bookshop were located at 53 Victoria Street, then 55 Victoria Street SW1. G6FO decided to work from his home; the new address was simply *Short Wave Magazine*, Buckingham. Eventually Victoria Street closed, and the office was run from two successive addresses in High Street, Welwyn.



The very first 'one valver' from *SWM*.

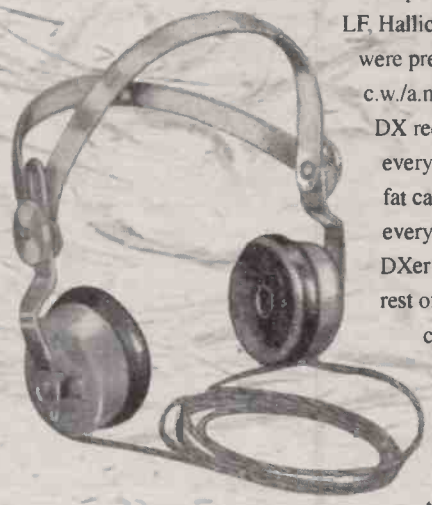
So - where did I come into this? In the 'fifties I wrote a couple of offerings for the *RSGB Bulletin*, one of which was actually used, after reading a library book discussing how to write articles that would sell - and a few years later in came a jumbo electric bill! So I sat down wrote several pieces and sent them to *SWM*. One, I recall, was on the updating of the National HRO, and all but one of the others were eventually used. Then I was holidaying in Hastings and had pre-arranged an evening with G6QB. A strange voice answered

my 'phone call and asked "...did I know anything about *Short Wave Magazine* because Tommy was in hospital, so could I tell what must be done." On the 'phone to G6FO, and Angus said "Thanks for the offer of help, but just ship it all back to me".

By the time my holiday was over, G6QB had, alas, become a Silent Key, and a letter asked me would I like to try and be a replacement for Tommy?

As I'd just parted from the infamous Emil Savundra G3SDN, of Fire Auto Marine Insurance Company fame - could a duck swim? I also crept back into the firm I'd left a few months earlier, and hoped to recover my dented bank-balance.

For the rest of that *SWM* volume I was anonymous, but at the start of the next, I got a by-line -



The *de rigueure* for any s.w.l. of 1937.

'Communications and DX News'. I was also 'Club Secretary' and the 'SWL column' continued to be anonymous though later, after many reader requests to know the author, we re-invented 'Justin Cooper.' All this on top of a normal daily job plus some evening technical college teaching was enough to make me solvent again.

Thus matters lay for a decade until Austin Forsyth G6QB became ill and shortly died. He was mildly diabetic, but it was his heart that finally gave out.

For another decade my name was on the masthead, until the Forsyth family sold out to PW Publishing Limited. Perhaps the highlight of my years was the article explaining just why the original Marconi Trans-Atlantic tests at the turn of the century succeeded, despite claims to the contrary. The author was one of the amateurs at the Science Museum. After it appeared, to my great surprise a lady sent in a picture postcard originally mailed by one of the Marconi team in Newfoundland - Captain Round from memory. It showed, as an inked-in addition to the picture, the antenna arrangement used there. A family heirloom, and a privilege to see and return.

Disconnected memories, looking at the adverts

Pre-war, a National HRO cost several months wages, so most receivers and transmitters were home-brew. Post-war, for some years the flood of war surplus receivers - HRO, AR88D and LF, Hallicrafters SX28, Hammarlund - were preferred, mainly with home-brew c.w./a.m. transmitters. To work Phone DX required strong ears - just imagine every station in a pile-up boasting a fat carrier, and each beating with every other!! About the only Phone DXer I remember was GM2DBX - the rest of us took the easy way out with c.w. Oddly enough the opening of the new 21MHz allocation in 1951 seemed to be the best place for the phone DXer.

The first commercial transmitter I saw was a crystal-controlled 'Q-Max B4-40' used as lab. test gear. In the 'forties it was advertised for a new price of £75 - about level with a TS-950SDX in today's prices. I could dream of a Panda PR120V at about £120 or a Panda Cub for a bit less. For 150W input - if you had a full-power ticket! - you were otherwise into a six-foot rack. My first receiver was a surplus BC348 from G2AK. The first 'post-war' receiver I handled was an Eddystone S640, thanks to G3LXP. *SWM* ran a picture of young Roger Jennison G2AJV receiving one as a competition prize. He is now Prof. Jennison and still licensed.

In G6FO's time, an article on making point-contact transistors by G3HMO was the first piece on 'Transistory' I remember. Practical, too - I actually made one that 'transisted.' By about 1961 Mullard transistors could be persuaded to work as a long-wave-only superhet. In the mid-1960s silicon planar epitaxial methods started the avalanche of 'solid-statery' we know today.

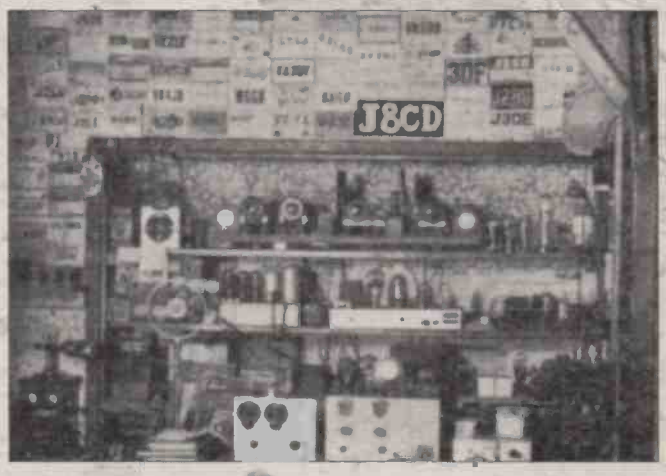
The first article I saw on single-sideband appeared in mid-1948,(I missed one in February of that year) discussing the techniques. For years afterward, anyone using sideband was told "There's something funny about your mod. old man!". The first sideband transceiver I ever saw was a home-brew copy of the Collins, belonging to G3MCQ, about 1961. In the 1960s *SWM*, advertisments for commercial equipment meant the British KW stable, or American gear by, say, Hallicrafters or Hammarlund, with kits by Heathkit.

Then came the Japanese, first Yaesu as Sommerkamp by way of Lowe - he announced himself as 'Bandit Bill' - then later Trio (now Kenwood) and Inoue who changed into Icom.

Test Gear

In the 1940s, along with the Avo 7 and Avominor, there was a Pullin giving 10000Ω/V, or you built your own from an *SWM* article. An advertised commercial oscilloscope had no probe facilities, the bandwidth depended on the 'Y-amp' gain setting but barely reached 100kHz and synchronising the timebase was a work of art - then came Tektronix, thank Heaven! Antenna measurements were so simple - tune for maximum 'up the spout' probably using a link-coupled tuner, as described in February 1953 or a surplus r.f. ammeter.

In June 1948, G4LU wrote an article on a superhet "in readiness for the new 420MHz band" and other items. I met Stan only this morning - at a Canal Restoration Trust meeting nearly fifty years on!



A 20m amateur station of the era J8CD, located in Korea.

Short Wave Listening Sixty Years Ago

Ray F. Fautley G3ASG started listening to short wave radio just before the first issue of Short Wave Magazine hit the bookstalls sixty years ago.

A radio book by F.J. Camm, found in my father's bookcase started my interest in short wave radio in 1936, when I was just 14. It contained a circuit for a one-valve receiver to operate on the s.w. broadcast bands using a four-pin valveholder as a socket for the plug-in coils. Nothing was soldered, all connections being made by the use of screw-down terminals. Not knowing any better, I built the set in a cardboard shoe-box!

This provided a far from rigid structure and made tuning something of an art! Being a reactive detector with a Mullard PM1DX valve, the sensitivity and selectivity were greatest when operated just below oscillation, or reaction, point. Not having a metal panel, the set was very vulnerable to 'hand capacitance' and in fact, I remember that the 'fine' reaction control to get only just below oscillation was provided by moving a hand backwards and forwards near the front panel controls!

The problem with reaction was that once the degree of feedback had been increased slightly too far, into oscillation, it had to be reduced considerably to stop it. This was a form of hysteresis - I'd not heard of the word at that time! - and meant that the most sensitive point, only just below oscillation, was very difficult to maintain. Sometimes the detector didn't seem to want to oscillate at all, and how many times was the valve blamed for this! It's easy to say now "Just reverse the connections to one of the windings on the coil and it'll oscillate allright!"

Headphones

The headphones used were a pair of S G Brown's high impedance type, 2kΩ per earpiece, and the aerial - what's an antenna? - was about 30 feet of wire attached to an apple tree at the remote end to keep it as high as possible. The power supply comprised a 2V accumulator for the 2V filament valve and a 120V h.t. battery.

The accumulator always seemed to 'run out' just when it was most needed, and it took a couple of days at the local garage plus the expenditure of 4d to get back on the air. The h.t. battery was later replaced by a mains operated Battery Eliminator having 120, 90 and 60V outputs.

This set was used for some time on the 25m band and 2RO Rome with its nightingale interval signal was received consistently. In fact 2RO was used as my only calibration signal! On 31m VK2ME, Sydney was heard on several occasions in the afternoon and also a station in Japanese occupied China, which I think used the call sign MTCY.

Whilst listening just ouside the 19m band I came across what turned out to be the 20m amateur band. From then on the broadcast stations took a back seat! I was living in Cheam, Surrey at the time and I soon got to know the voices of a couple of amateurs who were quite local to me, G8GD and G5RF.

Audio Stages

The next set I made had a metal panel and this time it had three valves, a screen grid detector (can't remember the valve type) a PM1LF and a PM2. Still, of course, a t.r.f. receiver, but this time with two audio frequency stages, both transformer coupled with each valve needing a different value of grid bias.

So a 9V grid bias battery was added to the set. The screen grid valve detector was a real luxury! It had two reaction controls, a normal variable capacitor ('low loss' of course!, and at that time known as a variable 'condenser') to vary the amount of energy fed back from the anode circuit to the grid circuit; and a potentiometer controlling the voltage to the screen grid. By juggling these two controls, a point of 'smooth' reaction could be found. This meant that the 'hysteresis' effect was very much reduced.

Part of Ray's log, originally written in his school excercise book.

Date	GMT	CALL	R	QSA	FAD	QRM	Wkg/Cllg.	Remarks
5-10-37	21.30	W1JZA	9	5	FF/S	XX	CQ	Speech qu. ex.
"	21.37	W2ZC	9	5	FF/S	XX	CQ G'	
"	21.39	W1JFG	7+	4	FF/R	X	W9GGA	
"	21.40	W2GIZ	7+	3	FF/R	XXX	G5C?	
"	22.39	W4BYY	7	3	FF/R	XXX	CQ	Bad Mod.
7-10-37	21.36	SV1CA	9	4	FF/SS	XX	G2AI	
8-10-37	22.16	W4DLH	8	4	FF/R	X	W2IWG	Callg. three stations
"	22.23	"	"	"	"	"	W4OC	
"	22.28	"	"	"	"		W2ZC	
9-10-37	16.50	VS2AK	7	4	FFF/RR	XX	G6ZI	1st LONDON QSO
"	16.57	VS2AK	6	4	"	"	CQ-DX	
"	17.04	VS2AK	7	4	"	"	G6DL [wkg]	
"	21.16	PY1FR	7	4	F/RR	N	CQ	Fair high NL
10-10-37	20.29	VE2AQ	6	3	FF/R	X-CW	CQ	Sigs. with a whistle
14 10-37	18.34	ES5D	7	4	F/SS	XXX-CW	CQ-20	FB-TX. But spoiled by CW.
16-10-37	20.15	FT4AN	7-9	3	FF/S	XX-CW	CQ 18	
18-10-37	21.29	W1BVS	7	4	FF/S	X-CW	G6AG	
"	21.35	W3AIR	7	3-4	FF/R	XX-CW	ON4SS [cllg]	
"	21.44	YV5AA	6	3	FF/R	X-CW	CQ-DX	My 1st YV-
"	21.45	FT4AI	8	2	FF/S	XXX CW	YV5AA	
"	21.51	W1AXA	9	3	FF/R	X-CW	W9BPB	
"	21.53	W8WA	5	3	NF	XX-CW	F300	
"	21.56	W1JFG	8	5	F/SS	N	G8MA	See 5-10-37 21.39
"	22.00	W1JZA	8	4	N	XX	CQ-20	sigs. whistle
"	22.16	ZB1L	7	3	FF/RR	XX	CQ-USA	"
"	22.17	EA9AH	8	4	F/S	XX-CW		English War News
"	22.35	W1BLO	8	5	F/S	XX-CW		EI2L
19 -10-37	07.40	W4IN	6	3	FF/RR	XX whistle	G5LK [cllg]	QRN-XX
20 -10-37	07.52	SP1DC	9	3	N	XX	W8GOE	wobbly TX
"	22.29	W1ADM	8	5	N	X-CW	ON4SS	either M or N
"	22.30	W1CRW	7	5	F/R	N	CQ-DX	
"	22.31	HK1EP	6	5	FF/R	XX-CW	W1— -	
"	22.36	VO1P	6	5	F/S	N	CQ	
21-10-37	07.09	W8ELF	7	4	FF/R	XXX	CQ-DX	
"	07.14	W5BGW	9	3	F/R	N	W5OK	
"	07.25	W8DIA	7	3	FF/R	N YK2ABB		
"	07.30	W1LFB	8	4	F/R	X-whistle	G8SB	
"	07.42	W2HS	8	4	F/R	N	F3HL	
"	07.44	W1ISD	8	4	FF/R	XXX	F300	QRM-CW
"	15.03	OZ5BW	8	4	F/S	XXX	CQ-20	Hi. Noise Level
22-10-37	07.32	VK2XU	6	3	FF/R	XX-CW	G5OB [wkg]	Bad QRN
"	18.32	I1MI	8	2	F/S	XXX-CW	G8LY ["]	Bad QRM
23-10-37	18.38	G5RF	9	4	N	X-CW	PK4AU	Good FB-TX
24-10-37	09.45	ES5D	8	3	FF/SS	XX	G5HJ	QRM whistle-CW
"	09.57	G8MA	5	5	F/S	N	NY2AE	calling NY— -
"	12.13	ZB1E	4	3	FF/R	XX	20m. fone	QRN-X
24-10-37	13.09	EA5SI	5	2	N	XXX	G8BX	vacuum cleaner
"	13.27	ZB1L	5	4	FFF/S	X-car	test 20m Fone	
"	13.37	EA5SI	5	2	N	XX	G8BX	TX with R4 hum
25-10-37	07.31	ZB1L	5	5	F/S	X-car	G6OK	
26-10-37	18.26	I1MI	7	4	N	N	G6BC (cllg)	Low Noise Level

Many amateur stations were heard but unfortunately I hadn't thought of keeping a log at that time. When just into oscillation the c.w. stations appeared, all on top of one another as the receiver had very poor selectivity. What did it matter, I couldn't read them anyway! Broadcast stations were of course easier to receive because of their greater power and a few I remember included two Americans located in Schenectady, New York, W2XAD and W2XAF which were heard frequently.

Berlin Olympic Games

The German stations in Zeesen were received whilst relaying the 1936 Olympic Games from Berlin. Another well heard station was CT1AA in Lisbon. Of course, I mustn't forget *Big Ben* on the BBC Empire Service! The following year, 1937, a real treasure arrived in the house, an ULTRA All-Wave superhet receiver with a short wave band covering 16m to 50m and, very unusual for those days, a tuned r.f. stage ahead of the frequency-changer (mixer).

The 20m amateur band soon became my usual haunt, and in October I started to write a log to record the stations heard. This log, from 5 October 1937 to 30 June 1938, is shown below. Remember, all these stations heard on 20m phone were using the old fashioned 'amplitude modulation' or a.m. (sometimes now called 'ancient modulation'). Perhaps a little explanation of the reporting codes that I used at the time will help.

My original log, which I've tried to copy as closely as possible, was written in my school Geography Excercise Book dated 9.7.35!

Of particular interest was station VP3THE. It was a kilowatt station operated by members of the Terry-Holden Expedition into British Guiana, which was sponsored by the New York Natural History Museum. Monkeys could be heard as well as many strange bird noises! Yes, I did get a QSL card, but where is it now?

Another station was EA9AH, operated - probably very clandestinely - in some part of Spain, giving news in English of the Civil War against Franco. ZA1CC was logged on 8 April 1938 - how long did it take for ZA to appear again after the war! The couple of items below were also in the notebook, so I've included them because they were my first attempts to try and produce the sort of signal report that I hoped would result in QSL cards from the stations receiving them. Yes, the reports were successful, but oh, oh, where are the cards now? (See Table below).

Well, that's the lot! Wish I'd kept a log of the stations heard when using the one and three-valve receivers. If only.....

R	**Signal Strength 1 to 9**	
QSA	**Readability 1 to 5**	
FAD	**Fading**	
	N	**none**
	F	**little**
	FF	**moderate**
	FFF	**very deep**
	R	**rapid**
	RR	**very rapid**
	S	**slow**
	SS	**very slow**
QRM	**Interference**	
	N	**none**
	X	**slight**
	XX	**moderate**
	XXX	**very strong**
CW	**Morse**	
Whistle	**adjacent carrier**	

The reporting codes used by Ray.

1ZE1JA-0 20-12-37.
Hrd. cllg. G6LL at 18.26, R7 QSA5 FF/RR NX. At18.32 wkd. G6LL. Using new antenna directional to England [with Zepp feeder]. Stated using 35.7 watts -420v. on anode. 18.21 turned back to G6LL. When turned back stated RXing G6LL very well. Said that had had several thunderstorms lately - rain season started late. TX situated 200 yards behind beam TXing antennas for London. Antennas -2 Franklin Uniform. G6LL tested with diff. ant. but said other ant. was no gd. as could not RX him at all. Only stat. I could RX on 20m band of any volume.

19-12-37. Hrd. wkg. G8IG at 18.11. R6 QSA3 F/S XXX-CW. Completely QSB'd at 18.25.

31-1-38. Hrd. cllg. KA1ME at 16.16. R7 QSA4 F/S NX.

8-2-38. Hrd. cllg. CQ-20 at 18.45, R7 QSA4 F/R NX. At 18.48 wkd. F3UL. R8 QSA4 when signed off with F3UL at 18.51. Clld. CQ-20 at 18.53, R8 QSA4 FF/S NX. At 18.54 wkd. F8GM. R8 QSA4. Said F8GM was QSA5 R8. Signed off at 18.58. At 19.00 clld. CQ-20m fone. R7 QSA4 FF/R NX.

Typical signal reports sent by ray to radio stations.

Congratulations *SWM* - From The Office Next Door!

Practical Wireless Editor Rob Mannion G3XFD congratulates Short Wave Magazine on reaching its 60th birthday and looks back at some of his own memories of PW's 'sister' publication.

My late grandfather **Fred Durnford** - who held the callsign 2FD before the Second World War - unwittingly introduced me to the delights of general radio through his regular copy of *PW*. I say unwittingly because he didn't know of the 'shared' magazine for many years. 'Grandpop' didn't encourage any visitors to his domain and certainly didn't want me in there. (And although I desperately needed a good pair of headphones such as he had, by the time he realised I was seriously into the hobby I had my own good 'home-brew' pair).

Despite his lack of help, I could get into his (always locked) 'shack' in my grandparent's home in Sholing on the eastern side of Southampton. I used to undo the screws on his - 'office' - as he called it - door to get access to the much coveted magazine.

In those days, the early 1950s, *PW* was a 'general' radio magazine covering many topics including Amateur Radio. However, as my interest grew and I started listening to those spots on the dial marked 'Amateurs' I discovered Amateur Radio and *Short Wave Magazine*...thanks to a remarkable strawberry grower.

Short Wave On 'Forty'

I was introduced to 'short wave' radio and the magazine one Sunday afternoon when I was listening to someone called 'Tom' on the '40 metre' Amateur Band on my father's beautiful Telefunken receiver. It was just after the famous and popular *Eddie Staartz* show on Radio Hilversum from Holland. I was tuning up the band from 49 metres when I first heard Tom talking to people who I couldn't hear, but it started a friendship whose memories I treasure to this day.

Tom Martin G3CTM (now a 'Silent Key') was a busy strawberry grower living less than three miles away. His delightful rustic Hampshire tones came over so well I eventually cycled out and tracked him down by looking for his antennas.

I was always welcomed with the same friendly smile and eyes with a humorous twinkle. And it was while sitting up with him - absolutely fascinated at what he achieved with his 'Panda Cub' transmitter, whether talking into the microphone or working in c.w. and talking to me at the same time - that I started reading '*Short Wave*'.

Although *PW* was a good 'general' magazine, my new discovery was obviously aimed specifically at the Amateur Radio fraternity and the only publication available on general sale. I was immediately 'hooked' and from then my bike was invariably loaded with copies of *SWM* and the much rarer *Short Wave Listener* being taken backwards and forwards from my home in the Southampton suburbs a few miles away.

Today Tom Martin G3CTM has gone, and his strawberry fields have disappeared underneath a large housing development and the giant Tesco Burseldon 'superstore'...but *Short Wave Magazine* lives on.

Like its sister publication, *SWM* has changed over the years, but it's still offering *something very special*. Long live the 'specialist' magazine. Many of us still enjoy **a good read** and don't want to sit in front of a v.d.u. all the time. So here's to your next 60 years *SWM*!

When the first issue of *Short-Wave Magazine* appeared, Eddystone were just 15 years old. Now, 60 years on, they are the only first issue advertiser still trading under the same name and in the same business!

John Locker looks at an innovative idea that could change the world of telecommunications over the next few years.

Mention the word airship and the mind conjures up images of those floating hotels of the sky, so popular in the 1920s and 1930s. The gondolas could carry accommodation for 30 passengers, with sleeping facilities similar to those of a Pullman coach. One such ship made by the Zeppelin company in Germany, and sold to the USA. The *Los Angeles* made over 250 flights, including trips to Puerto Rico and Panama before it was decommissioned in 1932.

Those days are long past, and although there are still a few modern airships around, mainly used for advertising, or camera platforms, the 'blimp' as it is affectionately known, is not a common sight.
If an American company, Sky Station International has its way however, all this will change, taking the hi-tech version of the airship firmly into the 21st century, and putting it back into the history books!

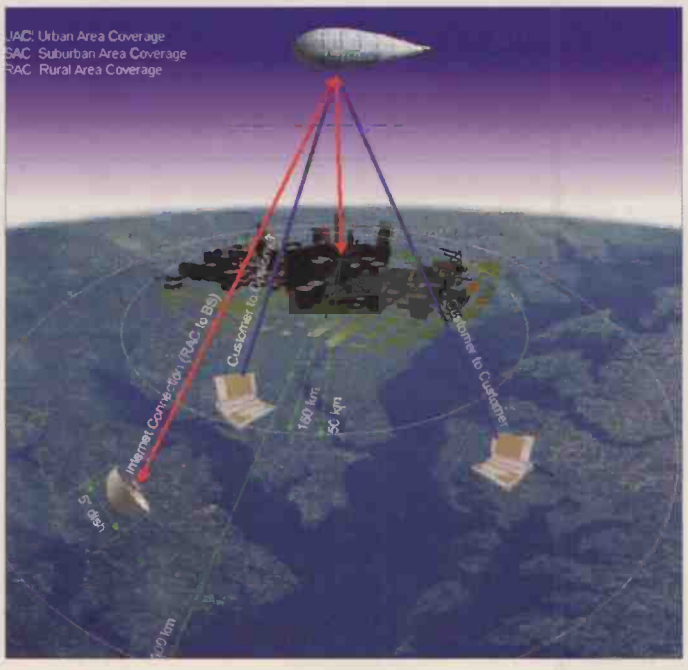
Not Just Hot Air!

They call it Stratospheric Telecommunications - ST - a system using platforms located in the stratosphere to provide broadband wireless service to over 90% of the world's population at a fraction of the cost of, and at efficiencies that are orders of magnitude beyond that provided by, existing terrestrial and satellite systems. ST systems are now possible because new technologies have been developed and proven that permit stationary lighter-than-air telecommunications platforms to be located in the stratosphere above commercial flight paths and over the world's largest metropolitan regions.

Sky Stations will be of variable size depending on market demand. Normally, a Sky Station will be approximately thirty metres square and have a total mass of about seven tonnes. Each platform will generate 75kW of power from solar panel arrays. After accounting for power needed for station-keeping and other functions, there is **15kW** of r.f. energy for telecommunications. This is adequate to support 150000 simultaneous 64Kbps transmissions.

This revolutionary technology is the first new way to communicate since the satellite, offering natural advantages that have not been previously possible. By transferring the telecommunications relay from the mountain top to a point directly over the areas of highest population density, angles of elevation of up to 90° are possible with short path lengths, providing the clearest wireless links that avoid building 'shadow' and other problems associated with wireless terrestrial - Cellular, PCS, microwave and satellite systems.

Stratospheric platforms avoid the power, weight, and size limitations and orbital restrictions inherent to satellite systems and permit the placement of a telecommunications relay exactly where it can provide the most benefits with the least drawbacks. The 1000km diameter footprint coverage area of each stratospheric station encompasses vast suburban and rural populations as well as high density urban users.



The Technology

The idea of the airship as a communications platform is nothing new, but SSI's propulsion system is. The 'Corona Ion Engine' was developed by Prof. Alfred Wong, Chairman of the Plasma Physics department of UCLA. This propulsion system is the breakthrough which, along with recent developments in lighter-than-air fabrics and related systems, permits the platforms to remain in the stratosphere for more than ten years without refurbishment or refuelling. The engine has no moving parts and uses no fuel other than solar power to generate a controlled plasma field using charged particles in the stratosphere to create the thrust necessary for platform station keeping.

The engines have been proven in stratospheric test chambers with thrust demonstrated at 300 times that of existing ion engines. The engines and prototype platforms are presently being optimised at NASA's Lewis Research Centre, the world's largest atmospheric testing chamber.

Keep It Green

The Corona ion engine is a completely non-polluting source of propulsion. In addition, stratospheric

platforms rely only on helium for lift, thereby eliminating the need for rocket launches which, when successful, burn fuel right where it does the most harm to the earth's ozone layer and, when unsuccessful, release toxic chemicals into the environment. Moreover, since each platform simply descends for maintenance, refurbishment or recycling, stratospheric stations do not burn up in the atmosphere like low-earth orbit satellites, avoiding the resulting pollution and space debris from orbit decay and repeated re-launch. There is now a better way.

More...For Less

Stratospheric platforms located over metropolitan regions will enable a globally-linked system of domestic broadband wireless and portable telecommunications facilities to provide interactive Internet and video picturephone services at prices affordable to most of the consumers in each of its markets (under 10cents a minute in the US). A PCMCIA card and microantenna converts a laptop, for example, into a go-anywhere, broadband wireless Internet terminal and videophone. Individuals in countries with an excellent wired infrastructure or with an inadequate wired infrastructure will be able to access the Internet at speeds from 64Kbps. Stations are scheduled to be operational by late 1999, with service to major markets world-wide during the year 2000 and developing markets by 2001.

Sky Station systems are the ultimate embodiment of the Global Information Infrastructure, bringing sophisticated universal wireless broadband service with its related educational, life safety and economic benefits to the world's population at a fraction of the cost of existing systems. In addition to levelling the gap between the telecommunications 'haves' and 'have nots', ST systems also provide 'intermodal' competition to terrestrial and satellite systems to benefit consumer service options and costs world-wide.

The efficiencies from the use of stations at such a low altitude is unprecedented: systems utilising 250 stations with each station generating 2100 spot beam cells and utilising a 600MHz bandwidth (300MHz in each direction) will be able to provide service to 150 million simultaneous 64Kbps channels. At conservative access rates, the overall capacity of such systems is adequate for 1.5 billion subscribers with 64Kbps channels, or 375 million users with 256Kbps channels. This capacity is far beyond that offered by existing systems.

Users of narrowband wireless services (paging, cellular, PCS) want more bandwidth to complement their portability. Users of broadband systems (wire, fibre optic and cable modems) want more portability without always being tethered to a landline. It is expected that there will be 300 million people world-wide using the Internet as a ubiquitous communications medium by 2005 and 350 million cellular users by 2005-2010. Only ST systems among the existing and proposed services and technologies are able to provide wireless broadband service on a world-wide basis as a mass access consumer service targeting consumers instead of business and institutional users, avoiding direct competition with other services that focus on different markets.

The Frequency Bands

Sky Station has requested the bands 47.2-47.5GHz and 47.9-48.2GHz for stratospheric telecommunications operations. There are no current users of these bands because they have been considered undesirable, given their high atmospheric path losses. However, these bands are ideal for ST systems since the high angles of elevation permitted by stratospheric stations overcome these attenuation losses, an ideal marriage of spectrum and technology. These bands are also the least occupied bands available world-wide allocated to the fixed service and the fixed-satellite service - the two services with which stratospheric stations have the most characteristics in common. The FCC staff in the US, and many other administrations, consider ST systems to be a terrestrial service rather than a satellite service since the stratospheric stations are located in the atmosphere, require the atmosphere to provide lift, and are not in a Keplerian orbit.

Sky Station International, Inc., the company formed by Prof. Wong, Gen. Alexander M. Haig Jr., and their associates, filed a petition and application with the FCC in March to create ST systems. The FCC staff has been extremely supportive of the potential offered by this new service and has indicated that a favourable rule making could be initiated by early 1997.

Since a station operating in the stratosphere is a new technology, the International Telecommunication Union (ITU), the treaty organisation that allocates spectrum to service classifications world-wide, will need to approve the use of stratospheric stations in the requested frequency bands so that countries can implement ST systems.

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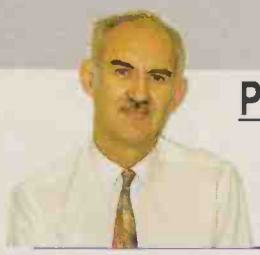

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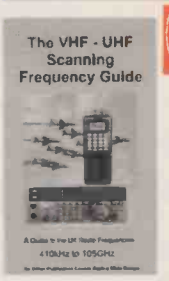

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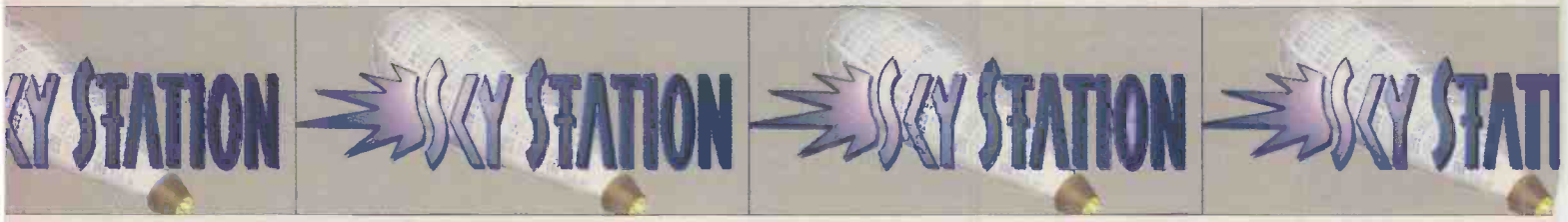

▶41 Strong international support exists for a low-cost broadband wireless infrastructure for Internet access and many administrations are expected to support the US proposal for use of stratospheric stations. Administrations want to be plugged in rather than left out of the Global Information Infrastructure and are eager to implement low-cost universal service. Developing countries recognise the benefits of instant wireless broadband infrastructure throughout their country at a fraction of the cost of conventional infrastructure alternatives. ST systems are capable of rapidly narrowing the unfair and wide gap between the 'haves' and 'have nots' of the telecommunications world. In addition, administrations are particularly supportive of systems utilising stratospheric stations since, as a terrestrial service, each administration may operate its own system, compared to a global satellite system that is authorised by only one nation.

Most importantly, Sky Station is establishing joint ventures world-wide with leading companies in each national market to provide for the implementation of systems utilising stratospheric stations. Each local joint venture partner is responsible for marketing the stratospheric telecommunications service and obtaining national regulatory approvals.

Who Buys Wins!

There is a fundamental advantage to financing stratospheric stations as compared to global satellite systems. Global satellite systems require that billions of dollars be raised and spent on constructing, launching and deploying complete satellite constellations and related ground infrastructure before revenues can be realised. With stratospheric stations, however, a single station begins to generate revenues as soon as it is deployed over a single metropolitan region, permitting a roll-out of service that is not possible with satellite systems. Between traditional debt financing of revenues and the purchase of platforms by joint venture partners in each national market, Sky Station need only raise $350 million to implement its system, compared to the $3 billion to $9 billion required for global satellite systems with less capacity and, in nearly all instances, fewer capabilities.

And That's Not All

Because the stratospheric platform is an entirely new form of telecommunications relay, it will quickly be adapted to improve and augment every form of communication. In addition to providing telecommunications services, stratospheric platforms are also ideally suited for meteorological operations and scientific applications, such as earth imaging and sensing and radio and optical astronomy functions. The platforms will also provide a superior means for global air traffic control systems, border patrol applications, among other benefits.

Safety First

Its clear then that the Sky Station platforms can do anything a satellite can, and more, but would you want a steel platform 30000m above your head? Safety is something SSI have taken very seriously.

Flight safety is a major consideration of the Sky Station development effort. Multiple safety features are being integrated into the entire system. The most important features are the on-board monitoring systems installed in the Sky Station to report back a steady stream of system information to the Ground Control Station. The use of zero pressure inner ballonets also greatly reduces the probability of any catastrophic rupture of the main ballonets since their envelopes are hardly stressed. The double envelope design also ensures that any rupture of the helium ballonets will not cause the helium gas to stream out since it is still confined by the outer envelope.

The thick-skinned structural balloons are more heavily stressed and are susceptible to rupture. But since they don't provide any lift, their rupture does not reduce buoyancy. This way, by design, a sudden and complete loss of buoyancy is highly unlikely. In the event of such an occurrence, the envelopes will reach a terminal velocity of, at most, a few metres per second, and, owing to their extremely low area densities, cause insignificant damages to properties or lives. Since the envelopes weigh a total of five tonnes, this is an important consideration. The rest of the Sky Station consists of multiple, nearly independent, light-weight modules with little or no mechanical connections. These modules all weigh under a tonne and are designed to come apart as soon as they are subjected to unsafe force levels, which they will be when they descend too rapidly. They are each equipped with emergency parachutes to slow their descent. Because of their long descent path, it would be possible to retrieve the impaired Sky Station with a suitably equipped helicopter. Tests of various failure modes and methods of recovery and/or retrieval can be conducted within the world's largest vacuum chamber at NASA's Plumbrook site. In the much more likely scenario of a slow helium gas leakage, which can be detected by a combination of steady internal pressure drop and a persistent drop in altitude, on-board compressed helium containers will be commanded to compensate for the leakage and arrangements will be made to bring the Sky Station down to a refurbishment site for repair after a replacement platform takes its place.

Below The Belt

So there we are, with hundreds of geostationary satellites in orbit, and many more to follow, with each launch the Clarke Belt becomes more and more congested. For this reason, if no other the Sky Station seems a very attractive alternative...not to mention the price!

The next few years are going to be exciting times for SSI, and any development that promises quicker and cheaper access to the internet, and home entertainment deserves to succeed. Remember, multi-media is here to stay, and this mode will provide excellent two way interactivity.

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specification

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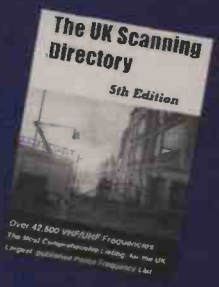

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Computers And Receivers - A Second Look.

WiNRADiO

John Wilson, well known for his knowledgeable reviews of radio equipment, was granted his wish to get a good look at the innovative WiNRADiO.

When I began writing reviews for *Short Wave Magazine*, I made a statement that no manufacturer ever deliberately set out to make a bad product. This is still my basic belief, but perhaps there is a *caveat* that a manufacturer may lose sight of the original target and produce something which is not quite what was intended. As a popular saying would have it: "When you are up to your backside in alligators, it's easy to forget that your original objective was to drain the swamp".

Following on from my article in the July 1996 issue of *Short Wave Magazine*, in which I rather forcibly questioned the wisdom of putting a sensitive receiver inside a computer, I received a note from Richard McLachlan of Lowe Electronics offering the loan of a WiNRADiO unit with an invitation to "comment from experience, rather than guesswork". I accepted the offer on the understanding that the results of my trials would be published in the magazine, and this article is a summary of my findings. Since the WiNRADiO had already been the subject of a review, (by Mike Richards, *SWM* May '96) I tried to confine myself to those aspects of its performance which related to my basic contention, but inevitably I shall go into greater technical detail than that contained in the original review.

...questioned the wisdom of putting a sensitive receiver inside a computer...

Instinctive

One of the problems with the WiNRADiO unit is that it is too big to fit into many desktop computers (surely there is a standard specification for computer cards?) so *Short Wave Magazine* hunted around and eventually stole a suitable 486DX2/66 PC from one of their staff members. The computer and the WiNRADiO were delivered to me and I immediately installed the card in the PC - very easily and with no problems at all. Firing up the software was simple, and the screen duly lit up with a very attractive simulation of a receiver front panel. Using the receiver with a conventional computer mouse was equally easy and quite instinctive, and I started out with a happy heart to find out what the WiNRADiO would do.

Richard McLachlan had said in his note that "If you pull out the antenna and let it scan, the number of sproggies found is minimal", so I did just that, starting with the medium wave band. I set the receiver to a.m. mode, the step size to 1kHz (the minimum available) and let it rip. Straight away I became aware that the noise from the receiver was cycling up and down as it scanned, and looking more closely I found cyclic noise peaks at 949, 990, 1062, 1128, 1169, 1198, 1262, 1327, 1396, 1461, 1525 and 1598kHz. Measuring the amplitude of the noise revealed that these peaks were between 6dB and 10dB above the background of the receiver and were being generated within the system, because, of course, I had no antenna connected.

Progressing onward and upward I came across breakfast being cooked between 1.954 and 1.960MHz with the sizzling of frying eggs, and discovered that the amplitude and frequency of these sproggies could be changed by changing the scanning increment of the receiver. Well, that's 13 (unlucky for some) nasties before leaving for higher frequencies, but I pressed on undaunted.

Throughout the h.f. spectrum there were numerous strange noises, including some real whacko signals accompanied by one second ticking noises on 3.150, 12.800 and 13.750MHz, with breakfast being cooked again on 5.870MHz. When tuning the 80 metre amateur band on s.s.b. using the minimum 1kHz steps I noticed that there was a five-tone rising repetitive sequence across the entire band. I ceased to record the various squeals and squawks when I reached 8MHz; suffice to say they were plentiful. In addition to this, every press of the mouse button produced a squeal from the audio, and using the mouse to tune the receiver by the simulated tuning knob produced a sound reminiscent of a Duchess class locomotive tackling the climb up Shap Fell, so loud that signals were inaudible unless I stopped tuning. Moving the cursor arrow around the screen generated rasping noises like Geoff Duke coming down to Creg Ny Ba on a big Norton, but nostalgia for the good old days of TT racing was not what I was supposed to be looking for. Before leaving the green pastures of h.f. I decided to go back and take a closer look.

Something Amiss?

Although switching the receiver sensitivity from 'DX' to 'Local' made no difference to either the 'chuffing' or the noise peaks, I discovered that terminating the antenna socket with a fully screened 50Ω resistive load actually increased the noise from the receiver, which would indicate

Table 1.

MHz	dB	MHz	dB	MHz	dB
5	+4	10	+8	20	+10
30	+7	50	+12	75	+13
100	+11	140	+11	200	+12

something amiss in the input section. Taking the output on a quiet frequency as 0dB, I measured the increase in noise resulting from resistive termination with the results shown in **Table 1**.

More on this later, but bear in mind that so far I had not connected an antenna to the receiver, so all these effects were internally generated. Since tuning around with a 50Ω terminator across the antenna socket was not the way real people would use the WiNRADiO, I then investigated how it performed as a normal receiver. First of all, and since I had all the test gear set up from previous review measurements, I did the standard series of r.f. checks, with the results shown in **Table 2**.

Now, although the sensitivity seems respectable, the dynamic range is poor, and there is no doubt that this receiver will just not survive in a crowded European h.f. band, a conclusion borne out by subsequent tests.

I then checked the cleanliness of the synthesiser by carrying out reciprocal mixing tests. This test consists of having a wanted s.s.b. signal on 14.1MHz at a level which gives 12dB SINAD and then introducing a clean unwanted signal via a hybrid combiner at various frequency spacings from the wanted signal at such a level which cause a 3dB degradation in the SINAD reading. The results are shown in **Table 3**.

It's clear that the synthesiser in the WiNRADiO is very noisy, and the noise is not confined close-in but fails to diminish, even at frequencies a long way from the wanted signal. In simple everyday language, if you were listening to a wanted signal and only one other signal came up as far away as 1MHz with a level of S9+40dB, not uncommon on broadcast bands and equivalent to 5mV, the wanted signal would be seriously degraded. Imagine what happens when you connect an antenna to this receiver with hundreds of signals at high level being fed in - the blocking would be dreadful. In order to test what happens under real conditions, I replaced the unwanted signal being fed into the hybrid combiner by the antenna supplied with the WiNRADiO, and checked how the wanted signal was degraded.

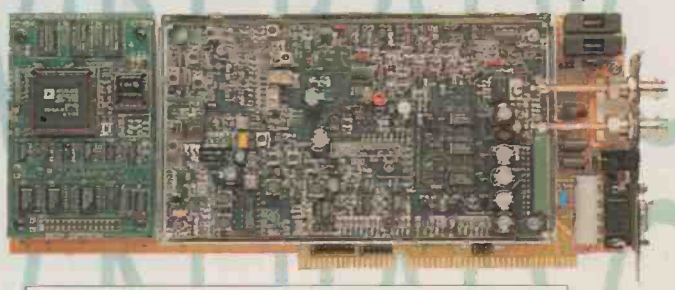

Table 2.

Sensitivity for 12dB SINAD:	s.s.b.	-117dBm
	a.m. 30% mod.	-108dBm
	a.m. 60% mod.	-113dBm
Noise floor:		-128dBm
Dynamic range:		43dB

Checks carried out at 14MHz, in s.s.b. mode, DX/Local set to DX.

The result? With a wanted signal on 14.1MHz, the signal level for 12dB SINAD was -117dBm. Connecting the WiNRADiO antenna to the combiner caused such degradation from other signals that the wanted signal had to be increased to -86dBm in order to restore 12dB Sinad. In other words the receiver was deafened by no less than 31dB and it would not be possible to hear any signals weaker than -86dBm (S6 on a normally calibrated 'S' meter). This was using the five metres of wire supplied with the WiNRADiO, and I won't bother to tell you how it performed when it was connected to a reasonably good short wave antenna. No wonder the instruction book tells you on page 48 that "The antenna should be no longer than five metres" and carries on "In fact, an antenna which is too long may feed excessively strong signals into the receiver, when conditions are good, which may cause overloading and intermodulation". You're darned right it will!

The poor h.f. performance of this receiver is not untypical of v.h.f./u.h.f. scanners which have had their frequency range extended at the l.f. end of the tuning range, so I'm not saying that the WiNRADiO is any worse than other scanners, but I do think that anyone expecting even reasonable results below 30MHz will be disappointed. To be fair to the importers, I don't think that they make any great claims in this area, and indeed Richard McLachlan of Lowe Electronics says in his letter "....although it is, of course, a wide band scanner rather than an h.f. receiver".

....although it is, of course, a wide band scanner rather than an h.f. receiver".

So, are there any noises in the range above 30MHz where the WiNRADiO should be at its best? I couldn't seriously check every frequency from 30MHz to 1GHz but I looked at those frequency bands where listener activity would be highest. Letting the radio scan through the air band caused it to stop on internal signals at 124.050, 128.000, 128.925,133.675, 133.750 and 136.0875MHz, whilst using manual tuning (accompanied by the *Duchess of Atholl* again) revealed that the internal background noise was rising and falling as the tuning progressed. I will mention this later.

Table 3.

Unwanted signal (kHz)	spacing (dBm)	Level (μV)
10	-90	7.1
50	-68	90
100	-68	90
150	-55	400
200	-55	400
500	-48	900
1000	-45	1250
10000	-29	8000

General Hash

On the f.m. broadcast band using wide f.m. mode, there was a constant background noise registering about one third full scale on the 'S' meter and consisting of jingling noises and general hash. Switching off every other piece of equipment in the house, **including the monitor on the computer containing the WiNRADiO**, made no difference to the noise level, so I have to assume that it was all being generated within the radio/computer combination. The 2m amateur band had only one seriously large self-generated signal above the general noise, but as I tuned higher and higher I found that the changing noise level, which I mentioned in the air band section, had a most peculiar characteristic. At many frequencies the noise level was jumping up and down, and since all these tests were conducted with the antenna socket terminated, the effect could only be generated within the receiver. For example, changing frequency from 299 to 300MHz (in the military air band) produced a 28dB drop in noise level, whilst further up the range the same strange effects continued, as shown in **Table 4**. The effect carried on at many frequencies right up to the frequency limits of the receiver.

The effect when tuning was to have your ears constantly assaulted by huge bursts of noise, up to +25dB louder, every time the receiver passed one of the affected frequencies, and this, of course, was in addition to the 'chuffing' caused by using the tuning control.

I have no doubt that I could have found many more spurious signals had I continued, but felt

Table 4.

Frequency (MHz)	Receiver output level (dB)
389	0
390	+14
391	0
396	-3 plus loud ticking
397	-6
398	+9
399	+16
400	+10
401	+16
402	+5
467	0
468	+25
469	0
639	0

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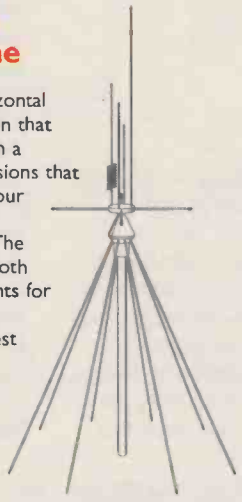

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that my original contention that putting a radio receiver inside a computer was a recipe for disaster had been proved beyond doubt. It must be significant that the handbook for the WiNRADiO contains many references to generated noises, on page 31 (a full page), page 56, which points out that computers generate noise! and a complete section on interference (pages 53 and 54) which contains this splendid comment: "One significant source of man made electromagnetic interference is the personal computer, and the video monitor in particular. Since WiNRADiO requires a personal computer to operate, this creates a potential paradox." - I definitely agree with that statement!

One final thing I noticed, with some amusement, was that the opening screen display when switching on contains an emblem for Rosetta Labs, who manufacturer the WiNRADiO. This logo rotates prettily for a few seconds after switch on - and in the process generates noise in the receiver on almost any frequency to which it is tuned. I checked on 100, 200, 300, 500MHz and 1GHz, and the 'rotating Rosetta' effect was there....*QED*?

Conclusions

Perhaps in the fullness of time some manufacturer will succeed in integrating a receiver inside a computer. At the moment, many manufacturers have successfully integrated a computer inside a receiver, which is not quite the same thing. The WiNRADiO is a 'virtual' receiver, and the execution of the software to produce an easy to control, well presented receiver on a screen is very good indeed. If you are a computer enthusiast who appreciates pretty pictures and has no experience of radio the WiNRADiO will be an amusing diversion. However, a listening enthusiast who wants a wide range receiver will be disappointed by the self-generated noises, which make h.f. listening almost impossible, and the combination of spurious signals, tuning noise and the sudden noise bursts of up to 25dB also make the v.h.f./u.h.f. ranges unpleasant to use. I rest my case.

Except, it seems, I'm not alone. I have an article from *PC Format* magazine which reviews a broadcast f.m. radio on a PC card, and the very first line of the review reads:

"Maybe it's just us, but isn't this integration of common household kit into the PC getting out of hand? Having a radio in your PC is about as useful as having a microwave oven stuck in your hard drive", and concludes "Alternatives to the Radio FX. No.1: Using epoxy resin, slap a Radio Shack tranny on the side of your PC. Connect aerial. Plug in. *Et voila...*"

My thanks to Richard McLachlan of **Lowe Electronics, Chesterfield Road, Matlock, Derbyshire DE4 5LE. Tel: (01629) 580800** for being brave enough to let me try out the WiNRADiO.

Because of the unusual nature of John Wilson's article, I decided to let Richard McLachlan of Lowe Electronics have the right to reply. Richard decided to pass this on to Milan Hudecek, the General Manager of Rosetta Laboratories Pty.,Ltd. who manufacture the WiNRADiO card. His reply is set out below. The debate is sure to continue and SWM will be publishing in a future issue an article describing a practical application of WiNRADiO.
Dick Ganderton, Editor.

ROSETTA'S REPLY

We are sorry to hear that Mr. Wilson does not like the idea of having a receiver inside a PC. While it is refreshing that he admits being biased, it is disappointing that he allows this bias to get the better of him. As a result, I believe that many of the negative conclusions made in his article are based on flawed assumptions.

Card Size

Mr. Wilson is, of course, correct in assuming that standard specifications exist for the dimensions of IBM compatible PC cards, and we are disappointed that he did not check them before deciding that our card was to blame. If he had, he would have found that the WiNRADiO card in fact conforms precisely to the current standard specifications for ISA cards (for example found in *PC Sourcebook*, Microsoft Press, page 8-25). If the card did not fit into his PC, the problem lies with a non-standard PC, not the card. Perhaps the manufacturer of that particular computer could shed some light on this.

Based on Mr. Wilson's own figures, the 'cyclic noise' he refers to is characteristic of that generated by his video monitor and/or video card, which would have been evident from a more thorough reading of the WiNRADiO handbook. In the handbook, we went to considerable trouble to make the user aware of the problems which can be caused by noisy monitors, and offered a range of proven solutions to minimise this sort of interference.

The same interference would be observed if any professional receiver were to be placed next to the PC and connected to it, for example via an RS-232 control cable, which is a common situation. In all cases, the solution is to install a properly matched antenna located some distance from the PC, and isolate it from conducted interference using techniques such as suggested in our handbook. WiNRADiO itself is extremely well shielded, using a special composite material which we developed ourselves, to provide both magnetic and electric shielding. Furthermore, good design techniques are used to prevent conducted interference finding its way inside the shield.

The level of any residual PC-generated noise is usually well below the external background noise. If there is an observable interference, the most likely path is via the antenna, which is not the fault of WiNRADiO. Even with very noisy computers, problems can be overcome using various methods suggested in the WiNRADiO handbook. The author's observation of noise peaks with the antenna disconnected must be therefore treated with some reservation: As soon as an antenna is connected, the background noise on the a.m. broadcast band (due to atmospheric and other normal environmental noise) rises substantially, to the point where any stray noises from the monitor and/or PC become insignificant. This is our experience, and according to feedback from our many customers, their experience as well.

...most likely path is via the antenna, which is not the fault of WiNRADiO.

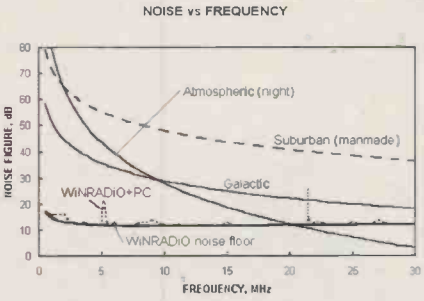
Some curves of external noise for the critical 1 to 30MHz range are shown below, converted to the equivalent noise figures. This data was obtained from *CCIR322 World Distribution and Characteristics of Atmospheric Radio Noise*, published by the ITU. Superimposed on this graph is a curve of typical noise figures, obtained from measurements on several hundred WiNRADiO cards. This parameter is measured on a variety of frequencies from h.f. to u.h.f., and comprises one of our final quality checks on all WiNRADiO cards. Cards exceeding the curve shown here by more than 3dB are automatically rejected, and not released until satisfactorily reworked and realigned.

We have also performed many measurements of the noise contributed by a typical PC, and superimposed this on the WiNRADiO noise figure curve. The results were obtained by averaging the measurements on a number of WiNRADiO cards installed inside a wide range of PCs. The antenna inputs were terminated in 50Ω. As seen in the graph, in suburban areas WiNRADiO is externally noise

limited by a significant margin, on all but a negligible number of frequencies. This margin is naturally less for quiet (e.g. rural) locations, but is still more than adequate. These curves are ample proof that WiNRADiO is perfectly viable inside a personal computer.

It would appear that Mr. Wilson expected a decrease in noise upon connecting a matched resistor load to the receiver input. This should not be so on any receiver. Virtually all receiver textbooks present the classic equation P=kTB, which describes the thermal noise power delivered to a receiver by such a resistor. For a low-noise receiver, this noise power is easily heard when an open circuit at the input is replaced with a resistive load. This noise increase, in fact, leads to a useful method of measuring the equivalent noise temperature of the receiver, from which the noise figure is easily calculated (see *ARRL Handbook 70th Edtion*, page 12-2).

The problems mentioned by Mr. Wilson are unusual and do not echo the practical experience of our customers and ourselves. If Mr. Wilson indeed encountered difficulties which he was unable to resolve, we would have hoped that the first natural step would have been to contact us to discuss them. We always prefer to co-operate with our customers to overcome problems, rather than letting the problems defeat us.



Other Instances of Noise

Isolated instances of noise on frequencies such as 12.8MHz are internal 'birdies' or products of internal oscillators, the likes of which are present on all except the most expensive receivers. WiNRADiO is certainly no worse, and in some cases is considerably better, than many popular mid-range scanning receivers.

The 12.8MHz signal is that of the internal p.l.l. reference oscillator. Every digitally-controlled receiver has one or more of these.

It would have been reasonable to expect Mr. Wilson to be at least as familiar with birdies as the average wide-band scanner user, so that he could make an objective comparison. We are disappointed that this does not appear to be the case.

For the benefit of those with limited experience, we have included a chapter on birdies in the WiNRADiO handbook.

Sensitivity

The reported sensitivity of 0.3µV (s.s.b.) and 0.9µV (a.m.) is within the published specification of 1µV nominal. The typical sensitivity on f.m. (another good point overlooked by Mr. Wilson) is 0.35µV, nearly 10dB better than specified.

Dynamic Range and Antenna Size

The author does not mention how he arrived at his dynamic range figure, in particular what was the separation of the two test signals. In our tests, using a 1MHz separation (usually used for such measurements), the dynamic range figures have been consistently better than 65dB.

While not as good as a more expensive dedicated h.f. receiver, it is nevertheless a typical figure for a 1.3GHz wide-band scanner.

The Local/DX button is provided specifically to counter the deleterious effect of many strong signals, such as exist in Europe at night. The handbook explains the use of this control in some detail.

It is a common fallacy that large receiving antennas always work better than small ones. In fact the opposite often applies, for two reasons: Firstly, it is easier to locate a small antenna away from potential noise sources than a large one. Secondly, the high efficiency required for a transmitting antenna is not needed for a receiving antenna. As Mr. Wilson himself implies, the levels of signals and noise in most urban locations (and certainly in Europe) are so high that the higher coupling loss of a small antenna is easily tolerated,

...WiNRADiO consistently delivers equal or better performance.

without affecting the signal to noise ratio. The reduced levels are in fact desirable, to minimise the chance of r.f. overload. We therefore stand by our advice not to use an antenna of excessive size.

Unlike many receivers, WiNRADiO comes with a basic start-up antenna supplied. Its three-metre length at the end of an equal length of a coaxial cable represents a good compromise between the requirements for m.f./h.f. and v.h.f./u.h.f. listening. While this antenna was never intended to be much more than a start-up facility for an immediate gratification of a new WiNRADiO user, it sometimes produces surprising results: at a recent communications exhibition in Singapore, an incredulous visitor thought we were cheating when we showed him a CNN satellite on 1.2GHz received loud and clear by WiNRADiO on this simple piece of wire, instead of the usual satellite dish.

Summary

WiNRADiO has been reviewed many times in a broad range of publications. The reviews have been generally very positive.

It is a pity that Mr. Wilson's statement regarding "performance not untypical of v.h.f./u.h.f. scanners" was not placed earlier in the article, and kept in mind when making bland assertions about the short wave performance and other negative comments in general. The specifications for WiNRADiO were in fact based on those of highly regarded mid-level scanners, and in side-by-side comparisons with such receivers, WiNRADiO consistently delivers equal or better performance.

Placing a receiver inside a computer is certainly not "a recipe for disaster". The whole viability of the product, established very early in the design cycle, depended on interference from the PC being negligible for all practical purposes. This aspect was thoroughly investigated, and our subsequent experience, together with feedback from many satisfied users, confirms the correctness of this view.

Problems with e.m.c. are certainly possible, but in the great majority of cases are easily resolved by following the recommendations in our handbook. Since nearly all modern receivers now contain an internal microcomputer, there is nothing inherently wrong with reversing the situation and placing the receiver inside the computer. In fact this seems a very logical step, considering the enormous flexibility of control provided by such a combination. We are sure that in the future, we will see many more examples of this sort of integration, and are proud to be at the forefront.

PC Magazine selected WiNRADiO as the Best New Hardware Product of the Year; the respectable US *R&D Magazine* gave WiNRADiO its coveted annual award for being one of the year's technologically most significant products; the *Internet* magazine wrote that "WiNRADiO is the coolest card you can stick inside your PC".

Specialist radio magazines are equally supportive. The German *Radio-Fernsehen Elektronik* wrote "WiNRADiO impresses first of all by the shielding of the high noise levels of a personal computer, and its above average sensitivity." At the conclusion of an exhaustive two-part review, US-based *Monitoring Times* wrote "WiNRADiO is a unique and useful monitoring product. If you are in the market for a very wide coverage, computer controlled, utility receiver below US$800, WiNRADiO is worth a serious look."

Apart from the many "computer enthusiasts who appreciate pretty pictures", WiNRADiO has found its way into many amateur and professional applications. It is also being used successfully by a number of well-known security and defence agencies, who are well aware of the advantages of having a radio receiver integrated with a PC, for various surveillance and monitoring applications.

I would like to express my sincere thanks to the Editor for being kind enough to publish this reply.

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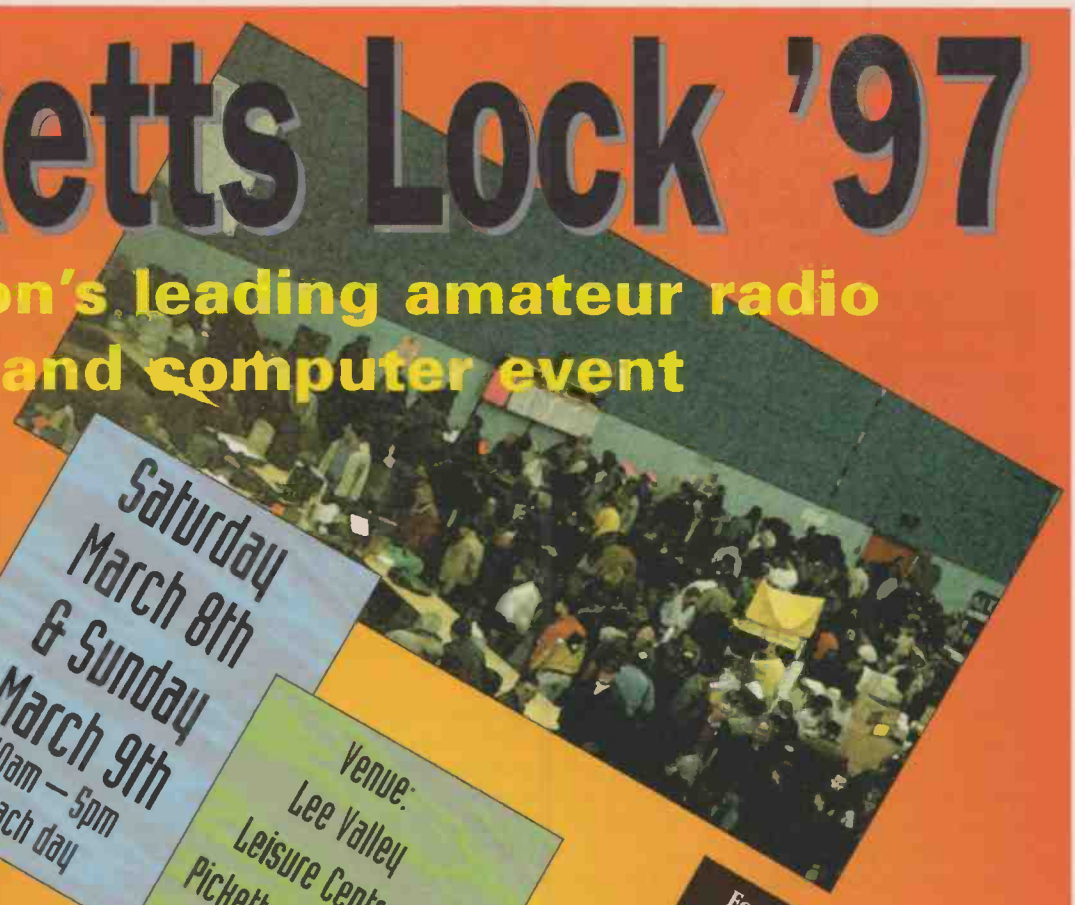

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Satellite TV News

Heavenly Sightings.....

This month's column differs completely from the norm. Over late January/early February I'm experiencing the trauma of a house move which means sorting out over 25 years of accumulated 'useful' things and discovering other artifacts long lost, dismantling antennas and transporting them to the new location. A 'normal' column at this time is impossible but in answer to numerous questions on entering satellite TV reception as a hobby it seems an ideal moment to expand the subject.

The query usually starts - "How do you start satellite TV reception?" or "What do you need to start satellite DXing?" I'll try to answer.....

Starting at the dish, I would advise nothing smaller than 900mm, a 1m dish is luxury and with 1.2m you're up with Goonhilly! Assuming you're in the UK you need to see as much of the sky as possible along the Clarke Belt, that's the imaginary line across the sky some 36 000km high over the equator where all the geostationary satellites are slotted, so looking from, say, Oxford it's a line very approximately rising from the horizon to the south east and lifting to about 30° elevation south and falling to the horizon in the south west. If a tree or building obstructs this line you lose signal - we're dealing with a 'line of sight' signal path. Fortunately the dish can sit on a stand at ground level or on the wall and not upset the neighbours, council planners, etc! Provided you keep your tracking dish in the back garden or rear/side walls then there is usually no problem of 'visual impact'.

Our dish can be either an offset (like the common Sky dish) where the LNB electronics are on a stand-off arm below the dish, or a circular prime focus where the dish seems to look higher in the sky with the electronics in the centre (focal point). To track across the Clarke Belt you require either a polar mount which moves the dish usually with an offset actuator arm, or an horizon to horizon (H-H) mount, an integrated motor/tracking mechanism. H-H mounts are commonly found on smaller dishes to say 1.2m. Clarke Belt tracking systems are adjusted with an indoor tracking controller with manual 'East-West' + 'West-East' buttons or pre-programmed memories. If you opt for wall mounting remember that the motor noise may be carried along the wall/building structure and produce unsocial noises in your neighbours rooms, terrace/semi owners please note. The larger the dish the sharper the beamwidth which will require care in dish tracking setting. I found the most difficult task in installing a tracking system was actually making the beast track across the Clarke Belt accurately. The books tell you how simply it can be done in 30 minutes though it took me three frustrating evenings! My advice is to read the book recommended at the end of this article.

Ku-band extends from 10.7-12-75GHz which subdivides into FSS 10.7-11.7GHz; DBS 11.7-12.5GHz and Telecom 12.5-12.75GHz. FSS traditionally covered 10.9-11.7GHz but Astra 1D added an extra 200MHz downwards!

The head electronics comprise an LNB (low noise block downconverter) + polariser - usually a magnetic (ferrite) polariser which adjusts from the receiver to either vertical or horizontal polarisation. Facing the dish will be the feedhorn that optimises the LNB signal input levels by ensuring that dish illumination is the dish surface and not beyond the sides (thus reducing efficiency and increasing noise pickup). Offset dish usually feature horn shaped feeds and prime focus use scalar rings. Use the feed assembly as recommended by the dish manufacturer.

Up to recently, individual band LNBs were used, but now highly efficient wideband/triple band/universal LNBs are available which switch with an applied voltage (typically 13 and 18V) from lower band coverage to higher band coverage and provide access across the whole Ku-band. To optimise reception on the smaller dish, ensure that the LNB has a low noise performance typically 0.8dB. or lower. Tracking systems usually have a separate polariser where-as Astra (Sky) systems have an integrated LNB/polariser, it's adjusted for optimum signal reception in one polarity then tightened in that position, the applied 13/18V then switches between vertical or horizontal. The individual polariser for the tracking system will normally be current controlled via a 2-wire cable from the receiver to switch and fine tune (skew) polarity. Fine tuning polarity (skew) is necessary because as the dish tracks it tilts the LNB assembly and slight correction is necessary to retain correct vertical and horizontal angles. Racal wideband polarisers are popular. Check also that flanges mate correctly, the feedhorn will have an output circular (C120) flange, ensure that this mates correctly with a C120 input flange on the polariser. The LNB input will probably be rectangular (WR75), so ensure the output polariser flange is WR75.

The LNB converts the incoming 10.70-12.75GHz signals down to an i.f. band typically between 950-2100MHz. The receiver specification will normally indicate i.f. coverage which is usually 950-2100MHz. An early receiver may offer 950-1750MHz. Ensure that the coaxial cable is standard satellite feeder, double screened with both a foil and a thick braid. Do **not** use low loss coaxial u.h.f. cable, it will still work, but you'll be unaware of the signals thus lost prior to the receiver! Even when the receiver is switched 'off', it's still partially 'on' providing power continuously to the LNB via the downfeeder. All r.f./i.f. sockets on the LNB, receiver, line amps, etc. use the horrible American F plug. For efficient plug termination you must use a proper F plug crimping tool, using large pliers just won't work.

Receivers

Receivers are a difficult requirement to discuss and I will not recommend any specific make or model. Most receivers are now handset controlled. It is still possible to acquire very cheap manual receivers from surplus haunts, radio rallies and part exchange units from satellite retailers. Manual receivers usually have a highish threshold noise level at around 7-8dB. But they tune rapidly and can scan over a band in a few seconds. I have and use Echostars' SR-1000 and SR-50 plus a Ruston Rees RR-50. A modern remote control equivalent may take up to 2 minutes each way! (Tuning a band means tuning 10.95-11.70GHz up in vertical and then retuning down in horizontal). With many satellites operational, in parts of the sky with only 3° separation, you could be into a long time tuning! I use 'electronic' handset tuning receivers such as Echostar LT-730 and Chaparral M60e. All of my receivers are not top of the range, all-singing, all-dancing models but much more basic and a lot cheaper - it's a hobby and an entertainment!

Manual receivers lack refinements such as decoder looping, they often have a low i.f. (70MHz) which can produce i.f. image problems with very strong input signals - from a large dish for example - and perhaps most important there's no accurate frequency readout. They can be improved by fitting threshold extension boards, adjustable i.f. bandwidth controls once simple i.f. looping has been inserted, other modifications such as wider i.f. tuning to make for a much hotter DXing tuner. A single i.f. input F socket is the norm, but will feature both baseband video/audio out + u.h.f. out between say ch.30-40. Polariser connections (usually mechanical which will require an easily obtained interface box to match into a ferrite polariser) and 12/18V switching is also a norm.

Remote control receivers should provide frequency readout on the receiver (tuner) itself or via OSD (on screen display). The OSD function can be a nuisance since it will mix with weak signals preventing lockup. It's essential that on tuning (searching for) weak signals (i.e. shash) that the screen remains a snowstorm rather than blanking (going blue), we're seeking both strong and very weak signals and need to check the screen for any hint of exotic reception. Often the OSD menus cannot be switched off the screen and feeding a TV may be necessary via SCART cabling (OSD is normally deleted from baseband SCART sockets). OSDs will include parameters such as decoder switching, LNB oscillator offsets, bandwidth settings, audio/video carrier frequencies, audio subcarriers frequencies, 22Hz switching, signal polarity, polar mount dish settings and many other functions. They need to be accessed quickly. Memories can be useful for known (favourite) channels but keep a few for basic search starting points. Remember that the hobby is that of tuning the Ku-band looking for signals, not spending the time hammering buttons on an infra red remote control!

Connection to your TV is simple. All satellite tuners have an r.f. (u.h.f.) output usually variable on a channel between 28-40, though an increasing number of tuners have fully wideband modulators with an adjustable channel output across the whole u.h.f. band. This may have an increasing importance with the arrival of Channel 5 at Easter '97. All tuners have either SCART output or RCA phono baseband output sockets to connect to your TV (if baseband options are available) or for direct connection to your VCR and hence into your TV.

An ideal source for satellite equipment information, suppliers and advertisments is *What Satellite TV*, a monthly consumer magazine. Further recommended reading is *Satellite Television Installation Guide 5th edition* by John Breeds from the *SWM* Book Store! The advent of digital satellite television currently suggests that 'DXing'as we know it today is somewhat more difficult. Technology is advancing rapidly and within the next 12-18 months it's likely that digital receivers ex-Taiwan will become much more flexible and user friendly.

Equiping a receiving 'station' for satellite TV at first looks difficult, but once the basics are understood it all becomes much simpler. I was once told that "TVDXing is an art, whereas satellite reception is cheque book technology". Certainly if you can see the Clarke Belt then you can just throw money at equipment to eventually see any signal. It is possible with careful purchase to assemble a receiving installation inexpensjvely - it's a hobby for seeking out signals - entertainment and enjoying yourself, not a crusade in spending the domestic budget on the ultimate mega-bucks receiving machine! (*An equally valid statement for **all** aspects of the listening hobby! **Ed***).

Kevin Nice G7TZC

FREQUENCY EXCHANGE

MHz	Mode	Time	Call	Location	Monitor	Notes
8.473	c.w.	1320	A7D	Doha R.	lvt	Qatar.
8.485	c.w.	0725	HZG	Damman R.	lvt	Saudi Arabia.
8.505	c.w.	1325	TBO3	Izmir R.	lvt	Tuurkey.
8.515	c.w.	1330	5AT	Tripoli R.	lvt	Libya.
8.577	c.w.	1340	HLO	Seoul R.	lvt	South Korea.
8.598	c.w.	1335	OXZ	Lyngby R.	lvt	Denmark.
8.600	c.w.	1345	XSV	Tianjin R.	lvt	China.
8.622	c.w.	1345	PCB41	Schevenigen R.	lvt	Netherlands.
12.709	c.w.	0720	A9M	Hamala R.	lvt	Bahrain.
12.843	c.w.	1325	HLO	Seoul R.	lvt	South Korea.
12.853	c.w.	0800	GKB	Portishead R.	lvt	UK.
12.856	c.w.	0700	XSG	Shanhai R.	lvt	China.
12.953	c.w.	0730	VIP	Perth R.	lvt	Australia.
12.969	c.w.	1010	XSW	Kaohsiung R.	lvt	Taiwan.
12.970	c.w.	1310	PXK	Jakarta R.	lvt	Indonesia.
16.868	c.w.	0735	9VG	Singapore R.	lvt	Singapore.
16.879	c.w.	0725	XSQ	Guanchou R.	lvt	Chino.
16.911	c.w.	0615	JNA	Tokyo R.	lvt	Japan.
16.950	c.w.	0745	9MB	Georgetown R.	lvt	Malaysia.
68.4875	n.f.m.	8-5	'S' Base	Donacaster	ya	Delivery Co.
79.0	n.f.m.	-	'Eagle'	Leeming	ya	11 Sqn Net.
84.3	n.f.m.	-	'Romeo'	Leeming	ya	RAF MRT Team.
120.825	a.m.	1028	GAFO33	-	mp	Dutch a/c requesting v.h.f. radio as no u.h.f. on board.
142.375	a.m.	1510	SATURN	Lincoln	bm	56(R) Sqn air/air.
142.875	a.m.	1620	SATURN	Lincoln	bm	56(R) Sqn air/air.
166.025	n.f.m.	24hr	-	Doncaster	ya	Mick's Taxis.
166.1375	n.f.m.	24hr	Brown Base	Doncaster	ya	SYCC Highways.
168.0125	n.f.m.	24hr	'A' Base	Doncaster	ya	A1 Taxis.
168.875	n.f.m.	24hr	-	Doncaster	ya	DSS.
168.875	n.f.m.	24hr	-	Doncaster	ya	Royal Mail.
233.8	a.m.	1101	AF8512A	Clacton	mp	Heading to Lakenheath.
233.8	a.m.	1343	5742	Clacton	mp	Own navigation direct to Lossimouth. Sqk 6137 QSY to 251.625MHz.
236.075	a.m.	1102	STING55	-	mp	F16 QSY to 337.6 Mildenhall.
242.15	a.m.	1442	COT196	Netherlands	mp	German voice - TTTE Torn.
242.275	a.m.	1004	CARBON 2	Neatishead	mp	In QSO with CARBON11, F3s in air to air comms.
251.625	a.m.	1017	GAFSW55	East UK	mp	Decent FL240 and radar advisory. Request for WX from Lakenheath.
254.825	a.m.	1228	RRR501A/8	East UK	mp	Torns - "we are on the way to Donna Nook following 501C".
263.075	a.m.	1102	AF8512A	-	mp	
263.075	a.m.	1241	RETR53	-	mp	F15? RETRO 52, 54 and 56 are Flight Leaders and are in eagle trail.
275.35	a.m.	0841	RANSACK2	Central UK	mp	Checked in to return to Conigsby.
275.35	a.m.	0912	SPIDER	Central UK	mp	Request to Buchan after corridor then to ARA.
275.35	a.m.	1426	GOLD51	Central UK	mp	KC135? wkg Landsend FL350 estimated 23 mins to landing.
275.475	a.m.	0907	SPIDER	Western UK	mp	British accent, not previously heard as British c/s.
277.125	a.m.	0833	RANSACK1	East UK	mp	29 Sqn F3, requesting to climb to clear icing. "RACSACK has a problem can you take hime over the tap, back to Coningsbury?".
293.475	a.m.	0820	MARCOTTE70	East UK	mp	KC135 requesting radar to Cottesmore.
293.475	a.m.	0831	AF8209	East UK	mp	F16 - requesting WX for Leuchars, Conningsby and Lakenheath.
293.475	a.m.	1316	BLUE72	East UK	mp	KC135? to Barkway on 127.42MHz.
293.475	a.m.	1444	COT196	East UK	mp	Requesting Marham WX.
328.475	a.m.	0950	CWL51	-	mp	Destination Bruggen.
337.6	a.m.	1300	-	Lincoln	bm	Laenheath Approach.
361.95	a.m.	1430	-	Lincoln	bm	Aux frequency.
373.1	a.m.	1005	RED1	-	mp	Air to air with RED2. duplex with 265.9MHz
410.05	n.f.m.	-	'Maple'	Sleaford	ya	5 Sqn Net.
410.725	n.f.m.	-	'Triplex'	Sleaford	ya	29 Sqn Net.
422.875	n.f.m.	-	'Phoenix'	Sleaford	ya	56 Sqn Net.
456.375	n.f.m.	-	-	Doncaster	ya	DSS.
457.0	n.f.m.	1350	-	Doncaster	bm	Fire Brigade h/held.
457.0375	n.f.m.	1352	-	Doncaster	bm	Fire Brigade h/held.
459.475	n.f.m.	9-5	Papa Base	Sleaford	ya	Padleys Poultry Factory.
459.55	n.f.m.	8-8	'Degler'	Doncaster	ya	Pegler Factory.
459.8	n.f.m.	-	-	Sleaford	ya	BAE ACMI Team.
461.4	n.f.m.	24hr	'X' Ray	Doncaster	ya	Yorkshire Outlet.
462.0	n.f.m.	24hr	-	Doncaster	ya	Tesco.
462.25	n.f.m.	8-6	'Mike'	Doncaster	ya	M&S.
462.4875	n.f.m.	9-5	-	Doncaster	ya	Clarks Shoes.

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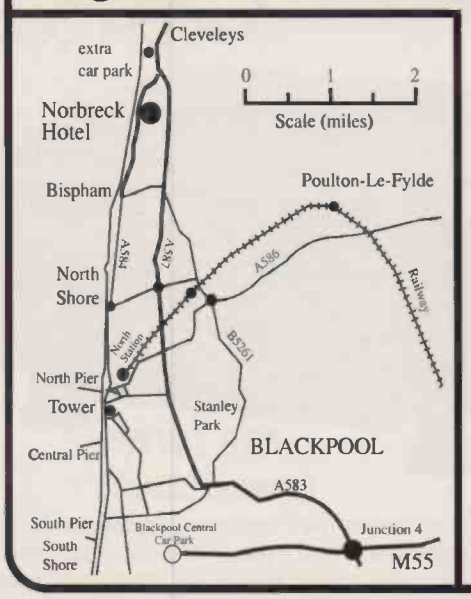

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Specification:

Receiver coverage	100 kHz ~ 2036 MHz
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Receiving modes	AM, WFM, NFM, USB, LSB & CW
Memory channels	400 total (4 x 100)
Search banks	Four
Aerial connection	50 OHM BNC
Audio output	0.7 WATTS 8 OHM load @ 10% distortion
Power requirement	External 12V DC @ 0.5A (nominal 13.8V) negative ground approx
Size	138mm (W) x 80mm (H) x 200mm (D) Approx excluding projections
Weight	1.2kgs

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CR8000 tape control interface £44.90

Graham Tanner, 64 Attlee Road, Hayes, Middlesex UB4 9JE. Internet: gmt@delphi.com

SSB Utility Listening

Africa

For the last few months, another new h.f. frequency has been in use by aircraft operating around northern Africa and the Middle East. A few weeks before last Christmas, I noticed that a number of aircraft working Cairo and Addis Ababa on 5.658MHz were being asked to change to a new frequency. I tuned down to the new frequency, 5.517MHz, and found it extremely active with many flights working some of the ATC ground stations usually heard on 5.658.

Since then, I have had the time to analyse the traffic, and it seems that the almost all the ATC stations on 5.658 have made 'appearances' on 5.517 at one time or another. There are some stations which I have not heard, but I have heard other stations calling them, and eventually passing flight details. One of the more active stations on 5.517 seems to be Tripoli ATC, which was always one of the rarer stations on 5.658.

This is a new frequency for the AFI-3 network, and seems to been an additional frequency, not a replacement as 5.658MHz still carries a lot of traffic. As ever, with these African stations, the best time to listen is during the evening.

Staying with Africa, but moving down to the other end of the continent, I have been told that a very good time to listen for southern African stations is also during the evening. The time of 19.00 has been suggested as a good time to start listening, and the frequency to listen to is 8.903MHz. This is part of the AFI-4 network, so you can hear numerous ATC stations including Brazzaville, Entebbe and N'Djamena.

If you interested in hearing some 'out of the way' stations, or rare countries on h.f., or even rare airlines and aircraft, this is one of those frequencies which is certainly worth listening to.

Antarctica

Over the Christmas and New Year period, much of the UK was covered in snow and ice, and the temperatures hovered around the 0°C mark. This set me thinking about signals from warmer climates. I then thought about other signals from the southern hemisphere; I did some research into frequencies and signals from much colder climates, and came across a listing of frequencies for the various stations in and around Antarctica. A few years ago, I remember listening to some weak signals from one of the British stations late one night, but I never realised that there were so many nations involved in research in the inhospitable terrain 'down there'.

Elsewhere on this page, **Table 1** gives a listing of the Antarctic stations, which country operates them, and some of their known frequencies. I must admit that this list might be out-of-date, but the only way to find out for sure is to listen for signals on the listed frequencies. When I listened a few years ago, I heard signals from Signy at Rothera on 9.106MHz, but that frequency does not appear in the list. Does anyone know if it is still an active frequency? It is important to remember that these are not 'military' set-ups, so they are 'stations' rather than 'bases'.

Table 1: Antarctic frequencies.

Station Operator	HF frequencies (all in MHz u.s.b.)
Marambio, Argentina	4.490 and 8.864
Casey Australia	5.400
Davis Australia	5.400
Mawson Australia	5.400
Comandante Ferraz, Brazil	500kHz, 2.128
Great Wall, China	13.158
Aboa Finland	4.119, 6.264
Neumeyer, Germany	6.264
Scott Base, New Zealand	2.773, 5.400, 11.570
Molodezhnaya, Russia	7.665, 13.385
Mirny, Russia	7.665, 13.385
Vostok, Russia	7.665, 13.385
Novolazarevskaya, Russia	7.665, 13.385
Bellingshausen Russia	7.665, 13.385
Rothera, UK	5.080 (l.s.b.), 7.775 (u.s.b.)
Faraday, UK	4.067, 11.453
Halley, UK	?
Signy, UK	?
McMurdo, USA	4.242, 8.998
Palmer, USA	4.067, 4.125, 11.553

Questions

Via the Internet, I have received a question from a **Mr Yavuz** (I hope that's right) in Turkey. He says that he is a keen short wave utility listener, and hears plenty of signals on all the usual USAF and RAF frequencies. He wants to know about any utility stations transmitting from Turkey. I have a limited amount of information concerning air traffic, but I wonder if any readers can suggest any suitable frequencies for Mr Yavuz to listen to. I am sure that there must be some coastal maritime stations, but I do not have any information that I can pass on.

Checking in the relevant RAF *En-Route Supplement* covering Turkey, it seems that most of the major ATC centres have the international Search & Rescue frequencies available (3.023 & 5.680MHz), while the Turkish Air Force at Izmir/Cigli are listed as using 6.6345MHz during daylight hours and 2.896MHz during the night.

Does anyone have any other suggestions which I can pass-on to Mr Yavuz?

Balloons

Last month I wrote about the various attempts to pilot a balloon around the world. By now, everyone will have realised that three attempts got off the ground (literally speaking). One of the most interesting (for UK readers, at least) was the flight by Richard Branson in the *Virgin Challenger* balloon.

It seems that many people stayed-up to hear communications between the balloon and Portishead in the early hours of the morning. In fact, several people report hearing a Virgin aircraft talking with Portishead and calling the balloon on 5.610MHz as the aircraft was returning from Morocco, having taken the Press to cover the launch.

One letter covering this item deserves a mention. **George R.** in Edinburgh wrote to say that he never had any success catching 'those faraway stations and was resigned to listening to VOLMET stations'. He goes on to say that he saw the balloon launch on TV, and then started to look for details of the most likely frequencies. He had no luck with that, and went to bed for the night. In the early hours he awoke, found the relevant article, and tuned to 5.610MHz, and immediately heard Richard Branson in the *Challenger* Balloon talking to Portishead radio. It is so good to hear from people who find this column useful, and are able to use it to listen to interesting signals.

The next attempt at the flight was just a few days later, the following weekend, in fact. The *Breitling Orbiter* team set-off from Switzerland, but ditched in the Mediterranean Sea just a few hours later. As yet, nobody has reported hearing any communications between the balloon and ground stations, but since it was only airborne for a few hours they may not have had time.

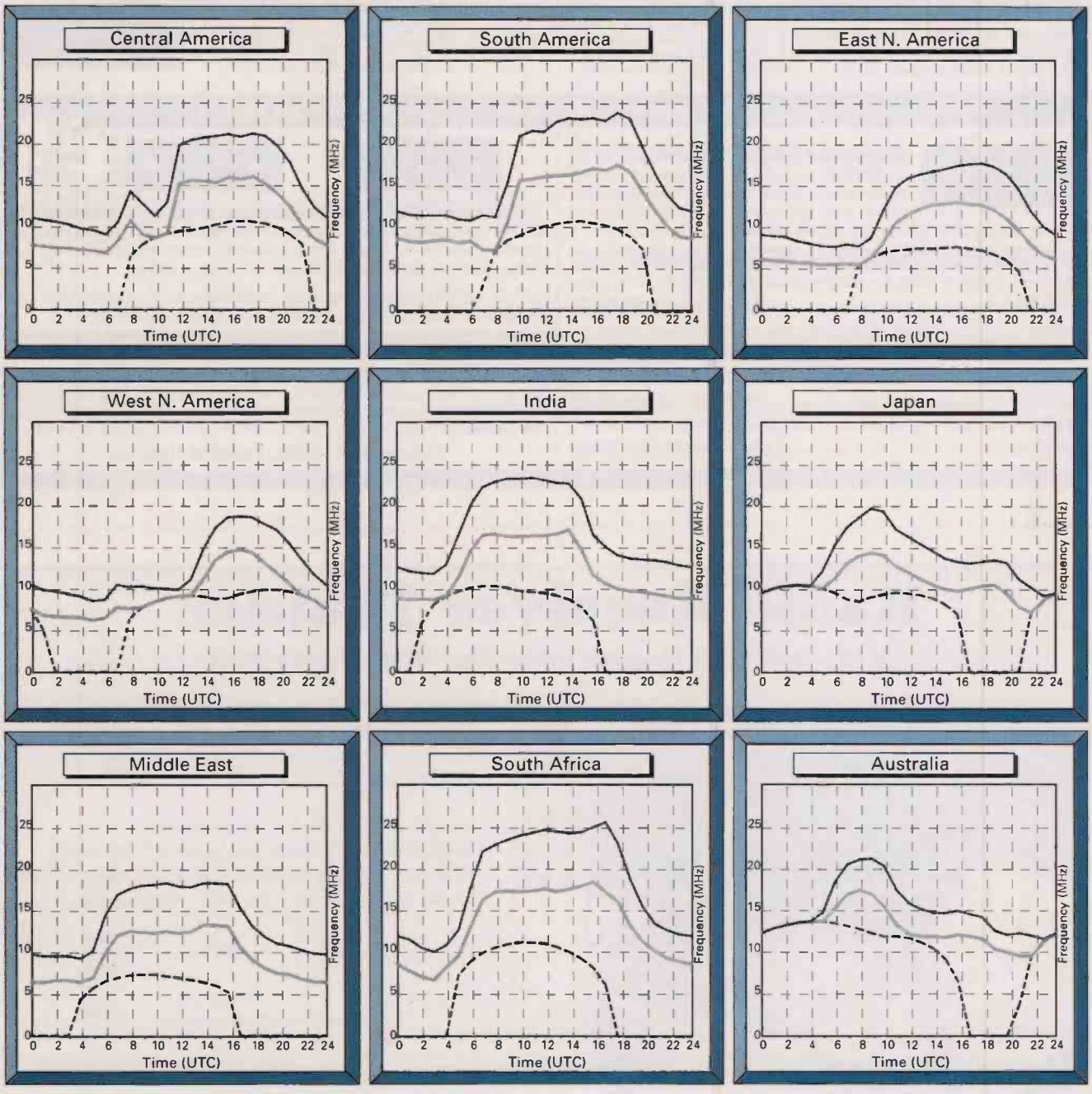
Finally, just three days later, Steve Fossett launched his balloon from Chicago and headed towards the Atlantic. This is the flight which ended in India over a week later. According to the information on the Internet, his balloon was equipped with h.f. radios for "communicating with ATC stations", however I have not seen any confirmed reports of this. He must have been in contact with somebody as he crossed the Atlantic, but I have not read anything about this yet. His balloon crossed from the USA to the Straits of Gibraltar, so maybe he was in contact with the Portuguese ATC at Santa Maria; the closest that I have to an actual report is from somebody who said that they heard a normal transatlantic flight briefly mentioned the 'solo balloon' in one of his regular contacts with ATC.

I have heard nothing at all about the other two attempts listed last month, and since the launch season is nearly at an end, it seems unlikely that they will fly now. According to the BBC, there could be as many as eight flights planned for early next year, so keep those radios glowing and ready for action!

Jacques d'Avignon VE3VIA

World Propagation Forecasts March

Circuits to London



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.

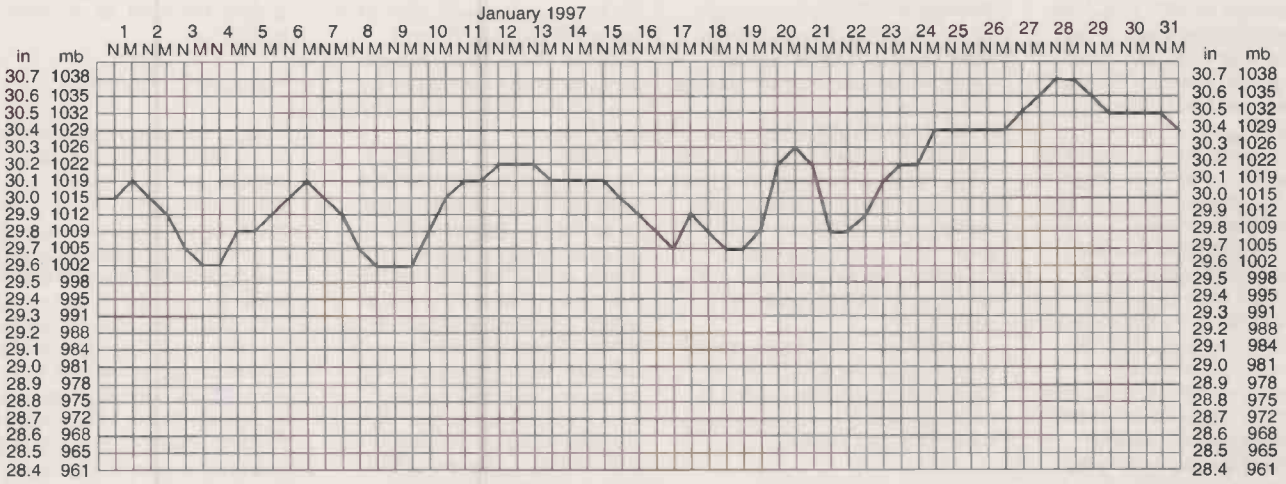
Good luck and happy listening.

Dick Ganderton, c/o *SWM* Editorial Offices, Broadstone

Propagation Extra

I believe that it is still essential that those readers who have an ongoing interest in propagation still have access to the various pieces of information collated by Ron Ham. I have asked Ron to continue to provide his monthly barometric pressure charts in the same format as before. In the meantime I am trying to arrange for a regular supply of sunspot charts and other similar information. If there are any readers who would be prepared to provide such information **on a regular basis**, please get in touch with me at the Editorial Offices, Broadstone.

Ron's barometric pressure chart for the month of January 1997.



Paul Essery GW3KFE, PO Box 4, Newtown, Powys SY16 1ZZ

Amateur Bands Round-up

Listening to the Amateurs

Let's have all your news and comments, sent as usual for the start of the month.

This is being written as the first exercise of 1997, so our first task is to thank you all out there for your many and various greetings for Christmas and the New Year - and, of course, to reciprocate.

It does seem that we are indeed past the bottom of the sunspot cycle, though we won't know for sure until the 'smoothed' numbers show it. I understand that the sunspot number got down to below 2 and there is an adage that says that historically it always goes below 5 before the bottom. In addition there has been a noticeable trend to improved flux numbers in the last few months. Who knows? Maybe the W6 sundancers are having an effect!

A friend mentioned to me a few days ago a new and unexpected advantage of having an antenna tuning unit in the system. Bob has the tuner settings logged for each amateur band from 1.8 up to 29.7MHz, and noted on the cover of his log. When he goes to a band he first sets the tuner to the logged settings; if the band is 'live' he checks to see if the tuner setting is right by finding a good signal and swinging the tuner. If the band seems dead he does a similar check on noise. Now, on this particular day the settings seemed 'all to pot' though signals were audible. A look outside revealed parts of his ground radial system covered in snow, and the antenna part of the system largely on the ground. A quick repair and snow-clearance, and everything went back to normal. For a listener, in his position, the band would in fact have seemed to be OK as signals were being heard - but when things were put back to normal the same signals were many decibels better. For a transmitting amateur such a mishap could be costly.

The International Listeners Association, better known to us all as ILA, have their HQ at **1 Jersey Street, Hafod, Swansea SA21 2HF**. In their December issue they mention the Heard All Britain Awards. Essentially the idea is to log a station in each of the small squares of the National Grid(NGR) for example, the Irish Grid for Northern Ireland and the Universal Transverse Macerator Grid for the Channel Islands. However, since many a square contains part of more than one county you need to log the county as well as the Square reference. For example NN25, on Rannoch Moor or TL52 in Bishops Stortford where there is a little chunk of Essex and a bigger of Hertfordshire. So, you log the WAB Squares, and perhaps it's worth noting that the WAB nets are often to be found around 1.94, 3,760, 7.060, 14.260, 21.320 and 28.655MHz always, of course, ± the QRM. For WAB purposes the report and reference must be confirmed by both ends. While you don't have to be a member to start collecting, one suspects you will soon decide that the ends are worthwhile.

Incidentally, such loggings are also good for the ILA's Counties Award which requires logging at least one station in each county of the British Isles and Eire.

Letters

Our anonymous reader asks about the history of national prefixes for amateur stations. Originally, in the USA and Europe for example, there were no prefixes, just a number and the suffix letter for example 1AW, 1BCG and so on. Indeed, pre-WW1 UK licensees had three letters only, for example, Carter, IRX. Radio waves are no respecters of frontiers, so very soon something had to be done and the Transatlantic tests of 1923 of course forced the issue. So, a letter indicating nationality was tacked on to the front of the callsign and the number. As the number, in the USA and elsewhere had geographic significance it was considered also part of the prefix. In due course this system extended world-wide. It is amusing to note in this context that the 'yell for help' from Rene Klein published in the *English Mechanic* of June 6, 1913 resulted in the formation of the Wireless Society of London, later to become RSGB. The letter indicates that already there were clubs in Derby and Liverpool, and the records suggest Barrow and Birmingham also. However, we get ahead. Up to 1910, licensed amateurs in this country had no callsigns at all, the three-letter ones being brought in to play in May 1910. After the war, in 1919 the USA led off by permitting full activity again, but only after securing an exam pass and an operator's licence too. It was May 1920 before UK activity recommenced, with low power and for no more than two hours a day, with no more than three specified other stations. Even to achieve this was quite a stiff fight for the young RSGB but it was at least a foot holding the door open. With all its faults, RSGB is still the only guardian of our bands, and the pressure to take them away and hand to the commercials is plainly horrifying.

At the outbreak of WW2 all licences were 'determined' and equipment impounded though some German signals using amateur callsigns remained on the bands. At first the post-war callsign structure comprised one or two letters, a number, and up to three letters, like for example my own GW3KFE. During the post-WW2 period we have seen callsign format varying somewhat, the first variation being for example of the form 9G1HE, and later we find such as D44BS or Z23JO. In the post-war period the ITU has issued blocks of callsigns to countries, who then issued amateur-form calls within their allocated block to their applicants.

Next we must turn to **Ted Hearn** in Newcastle, Staffs, who looked at Top Band for I1BQV, LA5FHA, OZ1DPR, SP2QCH, UR5ZRJ, UT0MY and UX0ZZ. Looking in to 3.5MHz Ted found AP2AR, BV2FI, C53HP, C31SD, CT3DZ, CU2BQR, DS5RNM, ER5DX, HL5NBM, HK6BRK, IC8JCH, JA2KIW, JF7DZA, JA1EOY, LU2ANN, OH5LF/P4, OI0RJ, OY9JD, PY2BW, PY3TD, T77WI, UR5EDU, VY2ROB, VZ9SW, XE1VIC, ZL1IU, ZL4BO, 9A4A and 9K2MU. Down again to 7MHz and here we find CO6RJ, CN8VB, HL5NDQ, IT9JCB, JA3AZD, PZ1EL, SU1GS, UR7HC, UT5UDC, VK2CP, ZB2IF, 9A1BST and 9H1GT.Finally, to 14MHz for CU2BS, D44BS, EL2DT, EL2EB, HI8CR, JI8AQC, JR3PEP, JT2AP, OD5MM, PY6JJ, RZ9MYL, V51BO, VK3AJJ, VU2XLZ, ZL3RG, Z22JE, 4K6CM, 5R8ET, 5B4AFZ, 9H1DL, 9Q5TR, and 9V1UD.

From Barnsley, **Colin Dean** reports on his doings on 3.5MHz with AP2N, C53HP, DU1KT, D25RNM(=HL 'special'), D44BC, EX8M, EY8MM, EZ6DN, HL1JV, JA1ELY, JA4KIW, JA6BEE, JA6BJT, JA0BYS, JT1BG, J68ER, NP2FL, OD5NJ, TA3BN, TG9IGI, TI4CF, UN0AA, VE2DS in CQ Zone 2, VK3DQW, VK3DZM, VK5PO, V29SW, V31DE, W6s, W7s, YB5QZ, YB6INU, YK1AO, ZL4BO, 4L4KK, and 9K2/YO9HP. Turning up to 7MHz we see A45ZN, A92FZ, C53HP, FT5WE, HC4L, HP1XVH, J68AS, NP4A, P43HM, R1ANZ, TA3BP, TI4CF, T77WI, UN5F, VU3SIO, XT2DP, YB2PBX, 3E1DX(=HP),4L5O, 5A1A, 7O1A and 9G1YR.

Here and There

Perhaps the most important news is that those of you who were awaiting the Heard Island expedition's visit to Crozet *en route* are, alas, going to be unlucky. A French seamen's strike caused the time-scale to be tightened and led to the decision that Crozet would have to wait for another time. On the other hand, Top Band addicts will know that, as planned they went QRT as TO0R from Reunion on January 5 after 411 contacts in 50 DXCC countries They intend to stop at Kerguelen on the return trip, but the time available will be minimal so they may not be active.

If you're looking for Malawi, from the beginning of February for four or five weeks, watch for 7Q7KH, with QSLs to the home address of WF5A.

Another one to watch out for is Jan Mayen. JX7DFA will be there until April. In Antarctica, KC4AAF Upstream Charlie Base, may be noted when the band is open.

Modes

Don't hesitate to look into other possible modes of activity on the bands. For example, Slow Scan Television; my first SSTV listening was done using a little old Sinclair Spectrum computer and freebie software, looking at the output on an old TV used as the monitor. You might, for example, find 4X4FD or 4Z4UT who are both active on slow-scan particularly on 14MHz.

Finale

Thanks to all of you for your letters and comments. Some information has been culled, as usual, from the weekly RSGB's DX News Sheet and DX Magazine. Other snippets thanks to the *59(9) DX Report* of PO Box 73, Spring Brook NY 14140 who have taken over Chod Harris's *The DX Bulletin* and merged them.

Letters as usual, to arrive by the first of the month to me please at PO Box 4, Newtown Powys SY16 1ZZ and meanwhile Good Hunting for the rest of 1997.

John Griffiths, c/o 22 Ffordd Beibio, Holyhead, Gwynedd, North Wales LL65 2EH.

Scanning

This month, as promised, we'll take a brief look at hand-helds. I say brief because I haven't the space to go into technical detail about the particular hand-held you may own. It's best for you to read the technical reviews previously written here in the mag and you can request a list of the reviews from the Editorial Offices - there you will find a more complex piece on a particular set written in far more depth than I can hope to cover here!

Before we look at radios, however, I'd like to address some criticism levelled at the column by various people both in the 'Letters' page and in personal mail. Maybe the column isn't to your liking, but it's all things to all people. I cannot write the first-place and definitive piece because I don't have the entire database of information you request!

I rely on the mail and try to answer the questions raised while also trying to make the hobby more understandable to all. It was said that I'd done some damage after my piece of *Emmerdale*. I'd disagree with that because I felt it presented scanner owners in a very negative light. That was my opinion - and one shared by other readers. I'm afraid to have to inform my critics that you are currently outnumbered on the popularity and content score by many more who welcome a) my non-technical approach and b) what I offer.

However, I do welcome criticism! I will state though that I cannot be everything to everybody. That's an impossibility. I reiterate that it is you, the readers, who write the piece. I do really only collate it! Lastly, I know that heavily technical pieces on conversions and radio-jargon do not please everybody as the majority of owners are not tech-bods! So, I say sorry to those who feel I'm not doing a good job and thanks to those who enjoy the simplistic and somewhat personal style of my writing! You can't win 'em all, I'm afraid!

Mail First

K. J. Helmsley of Nottingham asks what antenna is suitable for both Civ. and Mil. airband. His problem is that he lives in a hollow! He's sought advice from two manufacturers who, obviously, push their products and asks what I think. Well, without being biased, I'd say that as you are into the airband, and that is your area, I'd be inclined to go for the most suitable antenna available. To me - and this is personal - that has to be the Air 44N.

Why? Because it is built for airband and will have a higher gain - or less loses - than a more broadband antenna. Using your pre-amp will help as will getting the stick up as high as you can. I hope that gives you some ideas!

An interesting E-mail from **T. Trentfield** tells me about an unusual broadcast by Birmingham ATIS over Christmas and stating that ATIS wishes a 'Happy Christmas to all our listeners!'. Mr TT asks "is this what was meant for those who monitor the frequency as a hobby?". Who knows? Probably though! It would also be broadcast to all aircraft on that frequency as a sort of general messages wishing all well. However, it's well known that it isn't just the aircraft who listen in to the ATIS broadcasts! Nice touch, though!

What is MOULD, asks someone from the south of England. Briefly, MOULD is a military system, operating on v.h.f./u.h.f. It allows multi-access as well as divisional contact to be made to troops in the field. It is narrow band f.m. and uses over 100 static repeaters and talkthrough throughout the UK. Mobile repeaters can enhance coverage. Bands it operates in are: **73.925 - 74.100, 75.300 - 76.700, 149.000 - 149.900MHz** on v.h.f. and **410.000 - 425.000MHz** on u.h.f.

Also asked is how do they provide links to studio from programmes like *Treasure Hunt*? To the best of my knowledge, a second helicopter would be used as a comm's ship. I don't really know. Anyone out there got a better idea than that?

P. Ford poses a question that I'm going to throw to the floor. Why is it that a converter can produce a cleaner and stronger signal than some scanners on the market? Now, tech-bods, answer me that one!

He also asks why an a.t.u. can tune a length of wire from 500kHz, etc., up to 30MHz and why can't an a.t.u. be manufactured to tune from 25 to 1300MHz! This is another I'll leave to the manufacturers! If you have any ideas, then please write in. Rather tricky, I think, that one!

A. Burnett-Provan writes asking if I have an address for Paul Jones, who produces scanner lists on the Internet. I don't, I'm afraid. However, if Paul wants to get in touch then I'm sure I can pass on details for the written, or printed out, lists he may have available.

S. Brown writes and asks if anyone can help him with frequencies for the following callsigns heard on his set: **Starburst 1 - BBC North - Sky Sports**. He is interested in studio talkback and traffic, OB frequencies and *Match of the Day* talkback from St James' Park (Newcastle Utd.) and anything using talkback from this ground. Any good ideas from scanner/football fans?

Paul Mudge writes in with frequencies heard whilst Greenpeace were in the Liverpool area trying to blockade the berthing in Liverpool Freeport. Channel 12 - 156.300MHz was used, with callsigns overhead being 'Delta', 'Blossom' and 'Rover', these being the inflatables launched from the vessel herself. It may be worthwhile remembering these if you monitor any Greenpeace activity in or around seaports or other areas where this worthy organisation gets involved.

I'd like to say thanks to **Mike P.** for his logs. I do think, however, that you should now send them into the military airband column. I appreciate seeing them, of course, but don't want to stand on anyone's toes on this! So I will pass them on.

Lastly, I'll answer a question from **Mr G. Dickinson**, but within the next bit about hand-helds.

Firstly, What's Out There?

Buying a hand-held can be expensive and, as I have so often seen, a bit of a disappointment! I've known people buy the latest all singin', all dancin' hand-held who want to use it only for marine v.h.f. and have ended up with a bit of kit that is terrific, but over-kill for such a specialist area of listening!

Before committing yourself to buying one, ask yourself what it is you want to listen to. Also, ask yourself whether you want to auto-step with the in-built (and usually) 5kHz steps contained in the machine or would the ability to work 1kHz at a time be better? I'd say have the 1kHz step and the ability so do so manually. Why? Because frequencies change and the ability to step one kilohertz at a time is better than having it done for you!

So, what should you look for? Scanners work at v.h.f./u.h.f., so a starting point of 30 to 1300MHz is a good one. Above 1300MHz and you're looking at problems with reception as you'll need specialist antenna to go chasing what's up there! Again, scanners offering short wave coverage are a bit of a compromise and unless they have s.s.b. are not really worth it! I would prefer to have a cheaper, dedicated short wave receiver and a.t.u. rather than a scanner promising me the world, but, by virtue of what it has to do, less able than a separate set.

My Personal Choices

If I had a choice, what would I go for? - Hard one! - There are many good sets on the market and I have yet to play with all of them. However, over the years, I have made a list of those I think are good value and built for the job. I'm not going to upset anyone here - I hope! - but here I go with my personal choices and why.

Airband: Two sets! First, the venerable **Yupiteru VT-225**. This is a really good piece of kit. Why? Mainly because it offers dedicated r.f., i.f. and a.g.c. circuits for the optimum performance required on airband, while also still offering excellent marine band performance - vital if using the set for SAR listening between rescue helios, lifeboats and so on. After that comes the **Black Jaguar MkIV**. This is now a bit long in the tooth, but offers such excellent coverage on some bands. Owners enthuse about this set and, having used one, I also found it to be quite good. It sets from 28-30-60-88-115-178-210-260-410-520MHz, so it is a bit 'gappy' on other aspects of scanning. However, for airband, it is good. It has a.m/f.m. modes as standard and 16 channels as standard.

General: The old lady of scanners, able to tune to the lower end of the short wave band and still provide limited cover on v.h.f./u.h.f. is the **Sony PRO-80**. I've had mine for years and it is excellent on short wave! It covers widely from 150-108MHz, with selectable modes (a.m., f.m., n.f.m. and s.s.b.) and then, via an untidy and ancient looking converter, which you have to screw on and re-set the steps within the set, from 115-223MHz. However, it does allow you to scan through the seldom used bands

Continued p.69►

Keith Hamer & Garry Smith, 17 Collingham Gardens, Derby DE22 4FS.

DX Television

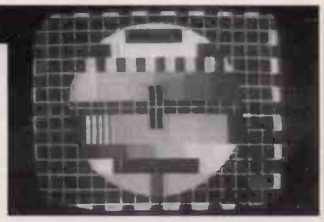


Fig. 1: A rare sight these days! TVP-1 Poland using the PM5544 with a dark-background. High-power Band I transmitters are no

December proved to be a reasonable month for long-distance television signals with instances of reception via meteor-shower, Sporadic-E, tropospheric and even Auroral activity. Reception is less frequent during the winter months so lots of patience and regular checks are essential. As one enthusiast recently remarked: 'Seek and ye shall find!'.

Reception Reports

Peter Barber (Coventry) witnessed a Sporadic-E opening to southern France on December 7th with ballet and general dancing from Canal Plus on Channel L3 (from the transmitter located at Carcassonne). Iceland (RUV) appeared on the 21st around 1400UTC with programme schedules and sample text pages on Channel E4. Unidentified signals via Sporadic-E occurred on the 4th and 8th on Channels R1 and E3 but these were short-lived.

Meteor-Shower activity was plentiful during the month with many unidentified 'pings' on various Band I channels. Tropospheric reception in Band III was possible on the 8th, 9th and 10th with France (Canal Plus on Channels L5 and L7), Germany (SWF on Channel E8), Belgium (RTBF-1, Channel E8) and Luxembourg (RTL Plus, Channel E7).

Stephen Michie (Bristol) also encountered many Benelux and German transmissions in Band III and at u.h.f. between December 8th and 11th. The best signals were Denmark on Channel E7 (Soenderjylland) with its distinctive PM5534 test card with 'DR TV' at the bottom, and the German FuBK test card from the Hessen Drei network on Channel E52 (Biedenkopf) with 'Hessen-3 FFTM' identification and digital clock and date.

Shaun Taylor (Goole) reports several unidentified Band III tropospheric signals which were present on the 2nd, 3rd and 12th. Further south, **Andrew Burfield** (Braintree) had a beanfeast during the evening of the 8th with a host of strong u.h.f. signals from France, Belgium, the Netherlands, Germany and Denmark. Signals lasted well into the early hours of the 9th. Andrew queries a signal from the west on Channel E59 with a G-shaped logo inside a box in the top-right of the picture. The sound spacing was 5.5MHz. The broadcast was in a foreign-sounding language, although some of the adverts were in English.

Channel 5 test transmissions from Belmont on Channel E56 are providing a source of 'firsts' for DXers. In early December, Stephen Michie saw colour bars with the slogan 'Give Me 5' emblazoned across the centre. **G.Tate** (Luton) also discovered strong Channel 5 signals from Belmont during a tropospheric lift on the 8th and 9th. The e.r.p. of the Channel 5 outlet is 50kW, a tenth of the power of the other four channels. For u.h.f. reception, a ten-element set-top antenna is used together with a Grundig colour receiver. For v.h.f. DXing, a reduced vision i.f. bandwidth system is used which comprises of a D-100 converter feeding a Ferguson 1690 monochrome receiver. G. Tate comments that living on the Chiltern range of hills, reception from all directions is favourable. UK stations received on a daily basis include Tyne Tees (weak on Channel 29) from Bilsdale West Moor, Central West from Sutton Coldfield (fair on Channel 43), Central East from Waltham (fair on Channel 61), Carlton TV from Crystal Palace (good on Channel 23) and Anglia TV from Sandy Heath (his local on Channel 24).

David Glenday (Scotland) has moved to the banks of Loch Fyne where there are beautiful views but very few DX signals! David says it is a challenge to receive the local four signals in noise-free colour and there are times when he wishes he was back in Arbroath notching up goodies such as TVP-2 (Poland), SWF (Germany) and SSVC (British Forces in Germany).

Pertti Salonen (Finland) reports Auroral activity on the 4th between 2122 and 2126UTC on Channel E3. A Danish movie with Icelandic subtitles was being shown and the sound channel could be heard at times. An unidentified Russian station using colour bars and a stylised 'PC' logo has been received on Channel R40 during two recent tropospheric openings.

Riccardo Mariotti (Italy) informs us that permission has been granted for a 6m amateur band from 50-51MHz. There is also a growing interest in the DXTV hobby in Italy despite the overcrowding of the v.h.f. and u.h.f. bands. Private TV stations are everywhere!

Finally, **Todd Emslie** (Australia) reports a gradual start to the Sporadic-E season (November to March down-under). The main highlight so far has been 525-line reception from the Philippines on Channel A2 (55.25MHz).

Fig. 4: Satellite and microwave installation for private TV transmitters in the mountains above Bergamo, Italy

Auroral Reception

Auroral reception is possible in the UK but with a greater success rate in Scotland than in the south of England. Antennas should be directed to the north for best results. The vision can be extremely distorted and is accompanied by severe hum bars and noise bands. Listening to the carriers will often reveal a characteristic sleigh-bell sound. Although Band I is mostly affected, Band III carriers can also be propagated. USA and Canadian carriers in both of these bands were monitored in the UK many years ago.

Fig. 2: A chocolate advert from the Estonian private TV station EVTV operating on Channel R30. This was received by Pertti Salonen in Vaajakoski, Finland.

Fig. 3: A Russian TV station received on u.h.f. Channel R23 by Pertti Salonen. This is 'RTR' (PTR in Cyrillic) transmitting from Vyborg. Test transmissions consist of colour bars with the 'RTR' logo in the top left-hand corner.

Channel 5 Tests

In addition to the colour-bar test signal radiated by Belmont, some of the main transmitters using Channel 37 have occasionally radiated a greyscale test pattern for short periods only. This is to ensure that interference is not caused to video recorders which have so far not had their modulators retuned.

Channel 35 transmitters include Bilsdale, Darvel, Fenton, Kilvey Hill, Sudbury, Hannington, Ridge Hill, Waltham and The Wrekin. The last two transmitters are so close together geographically that there is

DXTV Continued from p.67

bound to be some interesting co-channel interference effects in certain areas.

Eastern European Changes

Gösta van der Linden (Netherlands) advises that TV Nova (Czech Republic) have introduced a teletext service. Stereo and dual-language broadcasts will not be introduced until transmitter replacement is feasible. The Slovakian second-network (SVT-2) is now broadcast only via satellite. A private company will use the terrestrial transmitter network vacated by STV-2. All TV transmitters, including low-power outlets, which used Channels R4 and R5 (located within the CCIR f.m. band) have now been transferred to u.h.f.

Digital Tests

Using a spectrum analyser, **Dave Lauder** (Barnet) has discovered a local digital TV test signal on Channel 28. The signal is about 7MHz wide with a sharply defined upper and lower cut-off. Dave adds that it is difficult to detect whether a signal is present by examining the TV screen because it is indistinguishable from the normal off-air noise. A signal on Channel 34 has also been detected.

Fig. 5: The Thailand 'Channel 3' network received on Channel E2 by Lt. Col. Rana Roy in India. This was photographed during an F2 opening in 1990.

Iberian AFRTS TV

The reception of an AFRTS f.m. (American Forces Radio & Television Service) radio station in Spain by **Mike Gaskin** (Cornwall) has refuelled a mystery surrounding two AFRTS TV transmitters which are both listed in Band I with an e.r.p. of 2kW. One is located at Rota near Cadiz in southern Spain and is listed as operating on Channel A2 while the other is sited at Torrejon near Madrid and is listed as being on Channel A4. Neither station has been received outside of Spain which does seem strange considering their e.r.p. and also the number of intense openings from the Iberian Peninsula. We wonder if these stations have ever been operational?

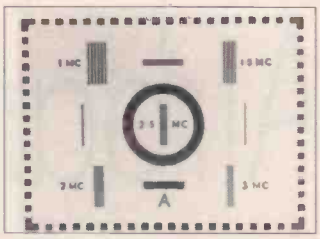


Fig. 6: This month's delve into the archives features the very first test card to be radiated on a regular basis - the BBC Test Card 'A'.

Keep On Writing!

Please send DXTV reception reports, equipment news, off-screen photographs and general information to arrive by the 3rd of the month to:- Garry Smith, 17 Collingham Gardens, Derby DE22 4FS, England.

Scanning continued from p.66

between 30 and 88MHz and, with an a.t.u. and an external antenna, is a bloody good performer.

Yupiteru MVT-7100 - A remarkable and absolutely brilliant performer! It has a 1000 channel ability, uses a.m./f.m. wide f.m./s.s.b. and is a wide frequency coverage set. It has a drawback in that it has a telescopic whip, but keen enthusiasts will always change the whip for 'rubber duck' types on their own particular area of preference.

Lastly, I'd also endorse the **AOR AR1500**. Again, one of the better sets on the market, this little gem has a good following and an enthusiastic press. It tunes from 500kHz to 1300MHz in a.m./f.m. and s.s.b. with an in-built b.f.o. (beat frequency oscillator) and, again, is a good performer on the short wave bands.

These sets are not, I hasten to add, a definitive listing! There are new sets on the market which are equally as good but I'll only talk about what I know! Of all the recent sets I received, the **Maruhama** set was also a surprise to me as it performed well and I didn't want to give it back! I don't seem to get sets to review anymore, so I have to look at what I know! However, having said that, I'm also cost-conscious and know that you can pick these sets up at a fraction of their new price in the magazine and they will both serve you well and perform excellently.

Buyer Beware

Again, because of the space available to me I cannot be any more definitive than just at a basic level. Hand-helds are always a good idea if you like to get out and about with a radio and also have the ability to be stood on a charger stand and connected to an external antenna for monitoring in the shack. They are confusing, when one looks at the coverage available, but it's really down to what you want to pay for. There are a few 'dogs' on the market too, but I can't list those I feel are not quite right for fear of legal action! My advice? Consider buying second-hand before new and remember, the sets are all things to all people! You are advised to consider the areas you are interested in rather than buying something that, in a few months time, you will find is too much for you! *Caveat Emptor*, as they say. Let the buyer beware!

I guess that wraps it up for this month. I'll do the same next month with mobile sets, so keep your eyes peeled on the magazine! After that, I think we should move to frequency bands and a general listing of what you can hear and where. Until then, please keep the letters coming in and thanks for the encouragement and the criticism!

Which one would you choose ?

Godfrey Manning G4GLM, c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS

Airband

By the time this gets to you, I hope that the weather will have improved enough to encourage you to start planning which airshows to go to. Chris (with camera in her hand, as ever) and I are certainly looking forward to the new season! **Arthur Budd** recommends his local show in Southport which isn't yet finalised, so keep August 30/31 and September 13/14 reserved in your diaries if you intend to go. Control by Woodvale 119.75MHz.

Procedures

Reg Dunkley (Havant) is understandably confused by band-boxing. Pilots working a controller can hear any other aircraft on the same frequency. If this didn't happen, two aircraft could unwittingly transmit at once - causing confusion. The problem is worse when one controller works two separate frequencies, as happens during quiet periods such as late evening. In this case, a pilot transmitting on the first frequency is also relayed on the other frequency.

Anyone (any pilot) listening on that other frequency hears the first aircraft and doesn't realise that it's on a different channel. As all aircraft on both frequencies can hear each other, this avoids two pilots transmitting at once. That's what band-boxing is.

Navigation

Global Positioning System (GPS) is a satellite-based navigation system that offers great precision from equipment advertised in this magazine at under £200. **Peter Wade** (Sevenoaks) has seen an article that questions its use for flight. It's too accurate! If there was a mistake, two opposite-direction aircraft could collide head-on as GPS would keep both in the centre of the airway with great accuracy. If the flight management computer could offset the track slightly to the right of the centreline, the aircraft would still remain in the airway but an error would result in a near-miss.

When following straight-line features during visual flight, pilots keep to the right of the line (not directly overhead) so as to reduce the chance of hitting someone coming in the opposite direction. So it seems sensible to offset GPS navigation in the same way.

Conventional instrument navigation still relies on ground-based aids, though. The accuracy of these can only be checked by a suitably-equipped aircraft flying under their guidance while a ground crew observes that the correct flight path is actually followed. For many years, the CAA (and the Board of Trade before them) have flown Hawker-Siddeley 748s G-AVXI/J in this role. **Chris Brenton** (Plymouth) has found that the aircraft communicate with the ground party on 122.275 (or 126.15 and 134.65MHz for the RAF equivalent).

Callsign is Calibrator (CAA) or Flight Checker (RAF), not to be confused with Checker vehicles that inspect runways for debris. The RAF gave their Andovers to Hunting in a privatisation deal but I believe the contract has moved on yet again! I want my Andover back - I paid for it out of my taxes, why did they have to give it away?

Information Sources

Concorde has had plenty of coverage in my recent columns. Don't forget the supersonic routes chart on my *Airband Factsheet*! If you want a copy, see the instructions at the end of this article. Meanwhile, you might be interested in a video about a flight on the aircraft. **Bob Burdick** (Connecticut) certainly was! At five hours long, you can obtain it from **Intelligent Television and Video Ltd., 77-78 Westborough, Scarborough, North Yorkshire YO11 1TP** (presumably PAL-VHS) or in the United States from a distributor known as JP (hope it's in NTSC).

When exchanging QSL cards with a radio amateur in the Azores, **Ian Whiteford GM-20847** (Irvine) was pleased to receive information extracted from the Portuguese *AIP*. It shows Santa Maria's h.f. oceanic control to be on (all MHz): Nat-A 3.016, 5.598, 8.906, 13.306; and Nat-E 2.962, 6.628, 8.825, 11.309, 17.946.

Follow-Ups

In the December 1996 'Airband' under 'Rescue' **F.J. Hermann** (Hull) asked for the dividing line between Kinloss and Plymouth Rescue Co-ordination Centres. **Martin Sutton** (CAA) and **Keith Campbell** (Carterton) tell me that this is the N52°30' latitude line over Great Britain. Plymouth gets a smaller area but more work due to the nature of south coast shipping. The boundary is different over the north Atlantic and Shannon also has an area of responsibility. Keith: are you able to provide air-to-air refuelling frequencies for publication?

Bristol 170 Freighter 31M. Sadly it crashed a few weeks later. *Christine Mlynek.*

January's question from **Lee Collins** (Leeds) about the Sovereign callsign is answered by Martin. It's Imperial Air Charter Ltd., a company I know nothing about! Will someone tell me what they fly?

Also in January's column ('Frequency and Operational News') I asked about the Manchester MCH n.d.b. that Arthur Budd tells me is on 428kHz. As it's been in existence for a while, I'm not sure why the official information from the CAA makes it seem like a new one.

Was the photo caption correct in January? **John Alton, Sqn. Ldr. Retired** (Salisbury) wonders if the Stampe is really a Tiger Moth. This is a well-known confusion. The fin's rounded trailing edge and the prominent oil cooler intake on the left cowling confirm that this is indeed a Stampe. I'm glad I got it right. I'd announced it as a Stampe for all to hear at the airshow last August!

Frequency and Operational News

Information from the CAA via *GASIL* 6 of 1996, *AIC* 111/1996 and the good offices of Martin Sutton.

Aerodromes: Barrow (Walney) loses its ATZ. Beccles really does have Air/Ground ('Ellough Beccles Radio') on 134.6MHz (see January 'Airband'). Brough loses its ATZ. Coventry really has a.t.i.s. on 126.05MHz so the Aerodrome FIS service (also January) is wrong. A simple misprint in the source information makes such a difference!

Flotta loses its ATZ. Glasgow a.t.i.s. remains on 132.175 but is no longer heard over the GOW v.o.r. beacon 115.4MHz. Remember that some other v.o.r.s still broadcast a.t.i.s. and so airband receivers that omit coverage of these (108-118MHz) can therefore be a disappointment. Stubton Park is a new aerodrome with ATZ near Newark-on-Trent, Lincolnshire, Air/Ground 119.425MHz (see last month's 'Frequency and Operational News').

Airways: London frequencies changed for: A1, A2, A20, UA20, A25, UA25, UB1, UB3, B4, UB4, B5, B10, B11, B317, UG27, UG39, UH52, UH53, UH54, UL3, UL74, UL607, UL613, UM14, UP2, UP4, UR25, UR37, UR123, UR126, UW70, UW501, UW502, UW532, UW534, UW536, UW538, UW550.

All change at Scottish Air Traffic Control Centre! Although the picture still leaves me confused, I believe the current frequencies (all MHz) to be: 119.875, 123.775, 125.675, 126.3 (was 123.375), 127.275, 129.225, 132.275, 133.675, Northern Radar Advisory Service Area 133.875 (was 124.5), 134.775. On the FIS, uncertain if 131.3 still allocated, possibly replaced by 124.825 and 126.25; 134.7 probably remains. Please let me know if you can clarify any of this.

Affected routes: A1, A1D, A2, A25, B2, B2D, UB2, B4, B5, B226, UG11, UH70, UH71, UL7, UL613, UN562, UN571, UN572, UN580, UN581, UN584, UN585, UN590, UN591, UN601, UN603, UN610, UN612, UN614, UN615, UR23, UR38, W3D, W4D, W5D, W6D, UW532, UW534, UW536, UW538, W911D.

Affected Danger Area Information Service (now 126.25, was 131.3MHz): D702, D801, D802, D803, D809(C), D809(N), D809(S).

Re-routings have taken place on UA25, UB2, UL607, UN572, UN581, UN583, UN584, UN593, UN603, UN610, UN614, UP2, UW501, UW502, UW701. Withdrawn airways: UH73, UN564, UN573, UN582, UN602, UN611. New airway: Y3.

Spitfire. ***Christine Mlynek.***

Instrument procedures: New Standard Terminal Arrival Routes (STAR): Astra 1H for London (Gatwick), Lorel (or Askey) 1P for London (Stansted) & Luton, Ockham 1F for London (Heathrow), Willo 1H for London (Gatwick).

Military airspace: Ternhill Area of Intense Aerial Activity (near Stoke-on-Trent) withdrawn. Air-to-Air Refuelling Area 6A withdrawn; activity information Area 8 available from London Radar.

Oil/gas platforms: Amend your copy of the RAF *En Route Supplement* as follows. Withdrawn platforms: Ailsa Craig, Emerald Producer, Frigg CDP1. Frigg QP 118.05 (was 129.75MHz). Arpet A n.d.b. HWQ 426kHz (was GU). Arpet C n.d.b. GC withdrawn. Murdoch n.d.b. MUK now 335 (was 334.5kHz). North Sea Forth renamed Harding, n.d.b. now HRD (was FRH).

Reporting points: New ones: BILLY, BUNCE, RONVI, TINAC. Withdrawn: ASPIT, BATSU, BORMA, MORIS, PORLA, RONAK. New visual reference point Warburton Green just west of Manchester.

These changes are unusually extensive. Trying to print the details in a short magazine article is impossible! If you need clarification on a specific change, write in. If you are badly affected by these changes then I can only recommend buying the latest radio-navigation charts and supplements. Suppliers are listed in my *Airband Factsheet*; send a pre-paid, self-addressed envelope (to hold two A4 sheets) to the Broadstone Editorial Offices (**not** to me!) for your free copy.

R. Chapman (Durham) please note the above! Readers might like to purchase RAF chart EU(H)12 because it shows TACAN routes and military reporting points (in faint grey print) as referred to on page 70 of the January issue under 'Mil Air.' Again, the *Factsheet* tells you how to get this.

Abbreviations

AIC	*Aeronautical Information Circular*
AIP	*Aeronautical Information Publication*
a.t.i.s.	automatic terminal information service
ATZ	Aerodrome Traffic Zone
CAA	Civil Aviation Authority
FIS	Flight Information Service
GASIL	*General Aviation Safety Information Leaflet*
h.f.	high frequency
kHz	kilohertz
MHz	megahertz
n.d.b.	non-directional beacon
TACAN	TACtical Air Navigation

Telephone Facility

I'm sorry that I've finally had to withdraw my telephone facility for urgent enquiries. This is because I have received no urgent 'phone calls!

Unfortunately, over the last few months, there has been a sudden tendency for readers to ring me up and ask for routine information. Regrettably I am unable to provide this service as writing this column has to be squeezed in to my spare time. Columnists are **not** employees of the magazine. A first-class letter should reach me overnight from most parts of the UK and you'll see your answer in the next issue. If your problem is **genuinely** urgent, then state your evening 'phone number on your letter.

Don't miss next month's 'Airband Special' issue. The next three deadlines (for topical information) are March 17, April 14 and May 19. Replies always appear in this column and it is regretted that **no** direct correspondence is possible.

Peter Bond, c/o Editorial Offices, Broadstone

Mil-Air

GPS Update

As a follow-up to my previous comments regarding the use of a GPS as an aid to the military enthusiast, **Andy** from Essex writes to me to say he is currently writing a book on the airfields of the former East Germany. Last October he travelled around for three weeks attempting to seek out the military fields originally operated by the East German and Russian air forces. Apparently, some of the airfield locations were well documented whilst others were extremely difficult to find - especially as some are now derelict. Consequently, armed with a borrowed GPS and a listing of Latitudes and Longitudes provided by a UK source he achieved a 100% success rate locating the elusive airfields. It's amazing what you can do with a bit of ingenuity.

USAF 50th Anniversary

The year 1997, is the 50th anniversary of the United States Air Force. It seems that quite a few British enthusiasts are making the pilgrimage to Nellis Air Force Base, near Las Vegas, Nevada, to attend a special 50th birthday airshow to be called the Golden Air Tattoo. The show takes place on the 25th/26th April and is expected to attract a large number of participants including several aerobatic teams the most notable of which is the 'Blue Impulse' from Japan. I have had a request from one of the 'MilAir' readers, who is taking his scanner to the USA and wondered if I knew any frequencies for Nellis. A couple of 'phone calls to those in the know produced the list of frequencies (top right)- The list is about a year old, but I am assured that most were heard in use last October.

I hope the list helps - Don't forget that you should use your radio with caution in any foreign country, their security and Police forces may not be as liberally minded as those in the UK! Scanners are readily available in the USA so you should not have any problems but your own radio will not have the cellular frequencies deleted as required by American law, so you should still operate it discretely. Incidentally, the UK 50th anniversary airshow is to be held at RAF Mildenhall over the weekend of the 24th/25th May, plus this will be one of the major themes of the International Air Tattoo at Fairford in July.

Blackbird

The on/off/on/off story of the reactivation of the SR-71A took another twist at the end of 1996 with funding at last being approved for 80 flying hours per annum. Two aircraft are to be maintained at operational status, both have been fitted with a new ventral dome housing a computer data link. This new dome caused some instability in flight because of disturbance to the airflow but this has apparently been corrected. There has been much speculation as to whether the aircraft may be deployed to the UK. Both Mildenhall and Fairford have been suggested as the possible operating location, but the apparent installation of new fuel tanks at Fairford, which can take the special JP-7 fuel used by the Blackbird, seem to make it the favourite choice. As the rumours of its return have been circulating for about two years, I won't hold my breath, but it would be nice to have some new operations frequencies to search for.

Callsigns

A request has come from **Ian** who has just moved to Kings Lynn, wanting to know if I can identify the callsigns used by 56(R) Squadron who fly Tornado F3s from RAF Coningsby. A check with the records produced the following list, can anyone update or add information? CHARGER, DELTA, DRUMSTICK, HORSEMAN, LION, LUCKY, MADDOG, PHOENIX, RAMBO, SATURN, SCORCHER, SCORPION, VOODOO, WARLORD.

Nellis	
Tower	324.3/132.55
Approach	279.7/124.95
Ground	275.8/121.8
Departures	352.8/135.1
Clearances	289.4/120.9
ATIS	270.1
Comm Post	381.3/320.0
SOF / Ops	303.2
Red Flag Ops	257.35/259.95
Area Radar	295.0/ 33.95

Frequency Focus

Not a lot of new information this month. Lakenheath has a new approach frequency in operation, **337.6** has replaced 398.35. As the old frequency was also used by inbounds into Mildenhall I assume that the new frequency will also be used by Mildenhall movements. The small grass airfield at Ipswich has closed and the associated frequencies are withdrawn. After a couple of changes, Shawbury DATIS is now on **292.575**.

That's it for this month - I know it's the quiet winter period with not much happening, but please keep sending in the letters.

Lawrence Harris, 5 Burnham Park Road, Peverell, Plymouth, Devon PL3 5QB E-mail: lawrenceh@enterprise.net

Info In Orbit

Fig.1: GOMS on 21 January at 1204UTC courtesy Planeta.

A call from the Royal Liverpool Hospital came a few hours into the New Year, telling me that my brother John had just been admitted to the Heavy Dependence Unit suffering from a severe, unexpected internal haemorrhage. He rapidly deteriorated so I caught the first coach back to my home town to be at his side. Miracles do happen, and despite the doctor telling us that his chances of survival were tiny, he came out of a four-day coma unscathed, unable to believe that he had been unconscious for so long. By Saturday his crisis was over and I caught the coach back to Plymouth.

During this return journey the coach passed through (it seemed) nearly every town in Britain, and I found myself associating the names of *Short Wave Magazine* readers with many places. Letters have been received from Liverpool, the Wirral, Birkenhead, Chester, Crewe, all along the line. When we approached Birmingham, I saw Telford (Roger Ray territory), then further into the Midlands. Bristol, Exeter and the southwest bring many letters as well. Brother John survived his ordeal - I had a call from him yesterday - finding his family probably feeling the worse for the experience!

Current WXSATS

Many WXSAT monitors have a computer and run a satellite tracking program to check on the orbits and pass times of the various satellites. These show that METEOR 2-21 and METEOR 3-5 were under low solar illumination in late December and early January - which is why neither were operating. I logged METEOR 3-5 on 14 January at 1624UTC, but I am sure it was on for the earlier passes while I was in town!
The oceanographic satellites SICH-1 and OKEAN-4 (or 1-7) are in limited use. SICH-1 is nominally off until March, and OKEAN-4 remains transmitting for short periods according to the schedule published by Alex Ivanov.

GOES-8 Problem Fixed

The USA's geostationary GOES-8 WXSAT lost lock on the earth at around 1330UTC on 9 January and entered a 'safe-mode'. The controllers then put the spacecraft in a 'safe hold' and reported the system stable, pointing towards the sun, but not providing any meteorological data. At first, the engineers believed the satellite had experienced some type of electrostatic discharge causing attitude and orbit control electronics to malfunction.
NOAA found that the problem was unrelated to an electrostatic discharge. Data indicated that the attitude and orbit control computer was not receiving telemetry from one of two momentum wheels which keep the spacecraft facing the earth properly. A fix, which required using a back-up momentum wheel configuration, was performed.
NOAA brought GOES-8 out of safe hold at 2130UTC on 10 January, and data started flowing during the early hours of 11 January. During the GOES-8 outage, GOES-9 was switched to its backup mode in which GOES-9 full disc scans were disseminated on the GOES-8 data circuits.

Fig. 2: SICH-1 image from Steve Rake.

GOES-K (the next GOES WXSAT) is being prepared for a 24 April launch. NOAA will place GOES-K in an on-orbit storage mode, only to be activated in the event of a GOES-8 or GOES-9 failure. My thanks to Jamie Hawkins, GOES Product Manager of NOAA/NESDIS for this information.

GOMS Images In Near Real-Time

Michael Zakharov, a scientist working at the Space Monitoring Information Support Laboratory (SMIS) of the Space Research Institute (IKI) recently announced that RPA PLANETA is on the Internet, and that images are to be updated each day:
http://smis.iki.rssi.ru/goms/goms_d.htm
They expect to have updates every two hours in the near future. I had a look on 21 January and downloaded **Fig. 1**, an infra-red image taken just a few hours earlier at 1204UTC.

LRPT - The Time Scale For Changes

Further information concerning the time-scale of the change from a.p.t. (automatic picture transmission) to l.r.p.t. (low rate picture transmission) is now available. The new transmission format is planned for the new generation of WXSATS.
Wayne G. Winston of the NOAA/NESDIS Direct Services Division points out that l.r.p.t. will first fly on the European METOP-1 satellite, probably being launched in the 2001- early 2002 time frame. NOAA plans to continue flying the present analogue (a.p.t.) system aboard its spacecraft for some years. This means there should be several years when both systems (a.p.t. and l.r.p.t.) will be operational. Wayne tells me that the present system will remain available until NOAA-N fails or is decommissioned; launch of NOAA-N is not scheduled until 2007 - making it approximately 2009-2010 before -N might be decommissioned and replaced with a U.S. l.r.p.t. WXSAT.

If the pace of development in electronics, and price-to-benefit ratios seen in the past decade are any indication, Wayne suggests that the transition to digital LRPT reception systems might not be as costly as they seem today. My thanks to Wayne for providing this comment.

New METEOSAT Schedule During 1997

Some positive changes are planned by EUMETSAT for both WEFAX and PDUS data dissemination from METEOSAT this year. Currently, in addition to METEOSAT imagery, METEOSAT-5 transmits WEFAX images from GMS-5 (the Japanese geostationary WXSAT) and GOES-E (GOES-8) on channel A2 (1694.5MHz). Later this year high resolution images from GOES-E, GOES-W (GOES-9), and GMS-5 are to be included in the schedule. In addition, GOMS (the Russian geostationary WXSAT) infra-red images are to be re-transmitted eight times per day in WEFAX format. No dissemination of high resolution GOMS images - from METEOSAT - is foreseen yet.

Existing GMS formats (the area covered by each image) are to be changed; GMSA, B, C and D formats will be replaced by GMST (total disc), GMSS (Australia) and GMSN (the north-west continent as seen from the WXSAT). More details will be provided in future months.

Letters & Pictures

Take a good look at **Fig. 2** from **Steve Rake** of Tredegar. I could only identify it because Steve told me that it is Alaska! This stored SICH-1 image was retransmitted to the ground station while passing over the UK (earlier last year). The numbers sequence includes information on the elapsed time since mid-night in Moscow, as well as identifying which onboard systems were operating. The coastline is that near the Gulf of Alaska, and Kodiak Island is just in the picture, at the bottom left.

Brian Dudman has some late nights (or rather, early mornings) in order to catch the retransmissions of OKEAN-7 and SICH-1 which were active last year. Brian sent me a set of these images from which I selected **Fig. 3**, which includes part of Cuba.

John Fitzsimons of Sligo in the Republic of Ireland, uses the results from his WXSAT equipment for a novel purpose. His Martelec MSR50 WXSAT receiver is fed by their JVFII interface (which is used with the JVFAX WXSAT decoding software) to produce images. John works part-time, farming clams and oysters on the north-west coast, and told me that the a.p.t. often provides advance warning of the approach of Atlantic storms. These can devastate clam beds overnight. John is also into astronomy and uses the same make of telescope that I use - but that is another story!

STS Plus - Version 9650

Users of the satellite tracking program STS Plus are probably aware that the author **David H. Ransom** has continued to develop

Fig. 3: SICH-1 image from Brian Dudman.

his program throughout 1996. When the latest version - STS Plus 9650 - arrived on the internet I downloaded it and invited David to tell me about its development.

David writes: "STSPLUS started life as STSORBIT about seven years ago when I got frustrated at my place in Northern California where I could not receive NASA Television - no C-Band satellite dish there! Not being able to follow a Shuttle mission in progress made me hard to live with, or so my wife said, so I thought "Gee, I'll bet I could write a program to duplicate the wall map at

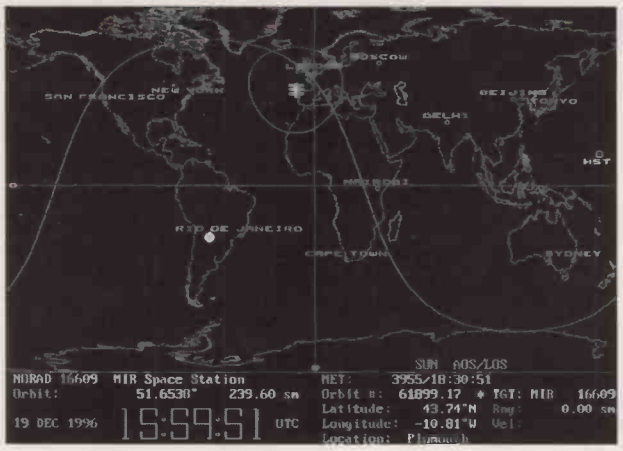


Fig. 4: Mercator display on STS Plus.

Mission Control in Houston!" Sure enough, several weeks of work brought forth the first (rather crude) version of the program.

STSORBIT had a rather simple 'flat map' and I came across a map database which had originated with the CIA in the early 1980s and which I was able to adapt for use as a map drawing program. More months of work later, and STSORBIT PLUS (STSPLUS) was born! Initially, it used a simple orbital model which had to be frequently 'adjusted' to track the space Shuttle. Then a friend, Paul Traufler, convinced me to adapt the program for US Space Command's Two-Line Elements (TLEs). Presto, I could track any satellite for which data was available.

The rest, as they say on television, is history. I posted STSPLUS on my own computer bulletin board system (RPV Astronomy BBS) and it started on its way around the world. Eventually, even the folks at NASA and USAF discovered it and five years later, STSPLUS can be found almost anywhere that satellites and the space programme are active. At one end of the user spectrum are the professional users like NASA, USAF, ESA, RSA, and so forth; at the other end are teachers and school children who get really excited to be able to track a satellite or the space shuttle in the classroom or outside at night and **see** it! Somewhere in the middle are the rest of us, amateurs, hams, and 'just plain folks' who are interested in satellites and our various nations' space programs.

This morning I just got back from a visit to Hollywood (Culver City) where I instructed some folks making a space and satellite related movie in some of the fundamentals of STSPLUS. With just a little luck, it will be in a theatre near you some time next year! Also next year, STSPLUS is due to fly on the Russian MIR Space Station and really get into space, another exciting adventure for my little gem!"

Version 9650 (it was issued in week 50 of 1996) is a features upgrade which also corrects a few minor bugs. A 'Night vision' option is added to allow use of the program on lap-top computers outside at night - where satellite spotting is done. Due to requests from geography teachers, Dave added a capability to specify the co-ordinates of the centre of the orthographic map in the Location Map mode. STS Plus is now millennium-proof - with the addition of code for proper operation past 1999! David also comments that "a number of small bugs have been fixed".

Any reader having difficulty in obtaining this new release from BBSs can have a copy from me by sending a secure 50p coin and one disk with return stamped envelope. Readers abroad should ensure that an international reply coupon is enclosed to cover return postage. I enclose a copy of current Kepler elements when readers request programs.

PDUS - Some Thoughts

Some years back I bought a receiver and high quality pre-amp for METEOSAT Primary Data (PDUS) - the high resolution imagery transmitted on channel A2 (1694.5MHz). My original system worked well, using a 1.6m dish fitted to a wooden frame. The frame eventually perished and I found it impossible to locate any supplier of suitable mounts within a tight budget. Meanwhile EUMETSAT encrypted almost all of METEOSAT's Primary Data image stream, charging 700ECUs - about £500 - for the decryption unit, so I made no further effort to restart the system.

Recent advertisements for suitable dishes price a 1.8m dish at around £550 including a mount. The idea of checking out large dishes for satellite television use came to me. Satellite television uses the 12GHz band for ASTRA and many other satellites now transmitting direct to home. My new project is to identify a dish, together with a polar mount (one suitable for driving between the satellites on the Clarke belt) and convert its feed to one suitable for METEOSAT telemetry.

Large dishes remain extremely expensive because of the surface accuracy required for 12GHz, and the delivery charge (about £70-£100) but have the added bonus of higher performance because they are figured for these higher frequencies. When the project is complete I shall mention the result in the column.

Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz
NOAA-12 transmits a.p.t. on 137.50MHz
NOAAs transmit beacon data on 137.77 or 136.77MHz
METEOR 3-5 (or 2-21) uses 137.85MHz
OKEAN-4 uses 137.40MHz
METEOSAT-5 (geostationary) uses 1691 and 1694.5MHz for WEFAX
GOES-8 (western horizon) uses 1691MHz for WEFAX
MIR 145.55 and 143.625MHz.

Kepler Elements - MIR and Shuttle

Before and during each Shuttle flight I receive a large number of requests for Kepler elements. This is how they are produced: Dave Simonson and his staff at the DOD C-Band Radar Network at Cape Canaveral, in Florida, generate and provide frequent state vectors (measurements of the Shuttle's orbit). These data are relative velocities quoted in 1/100s of feet/sec in their initial format They are processed by David H. Ransom (mentioned previously). The resulting two-line elements are sent via the Internet to a group of people, including me. Several sets may be processed each day. I print the latest set for each request that I receive. As an example of their value, some of the sets are about 60 minutes old when I post them!

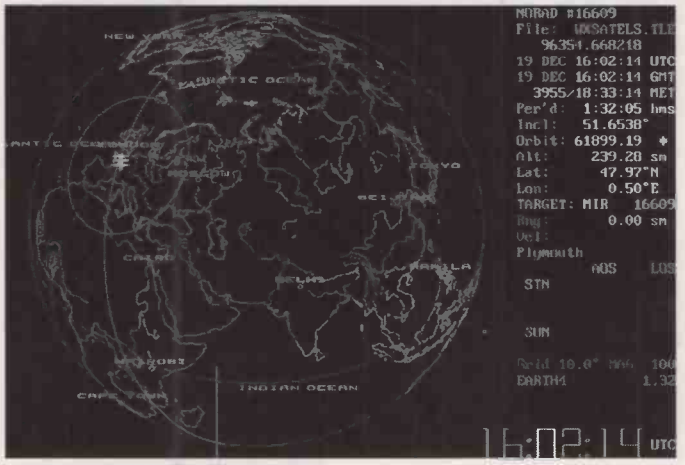


Fig. 5: Globe display on STS Plus.

MIR Monitoring

Like hundreds of other monitors, I regularly hear MIR voice on 143.625MHz during most daytime passes. **Jack Gore** reports hearing voice from MIR on the new 145.200MHz frequency (announced last month). Jack also reported that it was quite clear on a hand-held receiver.

Shuttle Launch Information

I am surprised by the number of people who tell of their recent trips to America during which they were able to see a Shuttle launch! One such explorer was **Tony Gutorski** who kindly provided confirmation of telephone numbers which I had obtained elsewhere, for finding out the latest launch information. The number 00-1-407-867-2314 is quoted, together with one for future launch dates: 00-1-407-867-4636.

A comprehensive listing of all Shuttle flights and payloads, together with associated information is available from me as the 'Shuttle pack'. Please include £1 and a stamped s.a.e. for the A4 booklet.

1. For a print-out of the latest WXSAT elements, MIR, and the Shuttle (if in orbit), send a stamped addressed envelope and secured 20p coin or separate, extra stamp. Transmission frequencies are given for all operating WXSATS.
2. I also send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (secured, plus four self-addressed, stamped envelopes) for four editions.
3. You can have the data as a computer disk file containing current elements for the WXSATs, and a large file holding elements for thousands of satellites. A print-out is included, identifying NASA catalogue numbers (for the WXSATs, Amateur Radio satellites, and others of general interest). This is ideal for automatic updating of your tracking software. Please enclose 50p with your PC-formatted disk and stamped envelope.

Mike Richards G4WNC, PO Box 1863, Ringwood, Hants BH24 3XD. Internet: mike.richards@dial.pipex.com

Decode

All the Data Modes

FAX Alignment

One of the problems facing listeners that use computers for FAX reception is obtaining nice square pictures that don't run diagonally across the screen. The problem is caused by the inaccuracy of the clock oscillators used in most PCs. Although they are crystal controlled, absolute accuracy is not necessary for normal computing applications. The secret of success in this area is to calibrate your FAX program so that it compensates for the clock oscillator frequency of your PC. Whilst you can carry out this calibration with an existing FAX station, a much better way is to use the highly accurate standard frequency transmissions that can be found on the h.f. bands. These stations are generally operated by government agencies and are usually based around a caesium clock that's locked to an international standard. As a result they are extremely accurate. Whilst I usually recommend using MSF Rugby on 60kHz, **Eric Lincoln** of Heighinton points out that there are many other stations that can be used. Eric recommends the RWM transmissions from Moscow that can be found on 4.996, 8.996 and 14.996MHz. The spread of frequencies offered means that the station can usually be received in Europe at any time of day. The transmission pattern used is: 10 mins unmodulated c.w., 10 mins of 1 sec pulses, 10 mins of digital code. This sequence is continuously repeated. To set-up your FAX program, first read the appropriate section of the operating manual, then tune your receiver to give a clear beat that registers on your FAX program's tuning indicator. Next set the FAX program to 60 or 120r.p.m. and any IOC. If you manually start the reception process you should start to see a pattern build-up you can now fine tune the receiver so that there is a very clear vertical stripe. If you have the facility to roll the image from side-to-side it's helpful to have the stripe running close to one side of the screen. This just makes it easier to spot any drift. All you need to do now is adjust the FAX program's timing correction factor so that you have a nice vertical stripe. You need to take your time when doing this - remember a typical FAX chart takes around fifteen minutes to send so you need to monitor the line for at least that length of time. Once you've completed the set-up you should receive well aligned pictures from all the standard weather stations. If the image is mis-aligned it's probably them!

Help.....!

I've received a couple of pleas for help from readers wanting to receive utilities using older computer systems. **Wilf Lycett** of Walsall has an Apple II computer and wants to be able to send and receive RTTY. A second request comes from **Alf Cartright** of Birkenhead, in this case he wants to use his Amiga 1200HD for utilities. If you know of any software sources, please drop me a line and I will print the details here and pass it on to the Wilf or Alf.

New Station Database

Jan Nieuwenhuis from The Netherlands has been a regular contributor to this column for many years now. In addition to being a very keen monitor he is well known for his excellent WX-FAX program that provides a computer based database of h.f. FAX stations. This has been available via a number of shareware distribution outlets, including my readers offers for some time now. The latest development is a new Windows program called Euro-TX which is a fascinating database of broadcast stations. The program is very well put together and makes excellent use of graphics to make the database easy to use. In addition to the basic frequency data there are addresses (Internet where available) and a DX-programme listing. If you'd like a registered copy of version 1.0 all you have to do is send Jan 10 Dutch Guilders **cash** or the cash equivalent. For this not only do you receive a registered copy but a very good deal on programme updates. The address to send to is: **Jan Nieuwenhuis, Vloedlyn 12, NL-1791 HH, Den Burg (Texel), The Netherlands**. My thanks to Jan for supplying the review copy.

Spectrum Analysis Tool

I've recently come across a brand new spectrum analysis program from **Kevin J. McWilliams** KW5Q. The program is called *SbFFT* which is an acronym for SoundBlaster Fast Fourier Transform. The basic principle relies on taking advantage of the digital signal processing capabilities of a modern computer sound card to carry out some sophisticated frequency analysis and filtering. Included within its range of features are selectable bandwidths of 2, 4, 8 or 16kHz and spectral resolutions of 1 to 16Hz per pixel. The spectral density can be displayed with any of 4 colour maps using either a linear or logarithmic scale. You can also use up to six filters simultaneously including band-pass, band-stop, low-pass and high-pass. The filters have 25Hz skirts, 3 to 50dB. Adjusting the filters can be done graphically using the mouse and the overall filter passband is shown on the main display. The program can take information from the CD-ROM and SoundBlaster line inputs so should interface easily with most radio kit. You can also use *SbFFT* to analyse .WAV files to process audio signals that have been previously stored on disk. To run a program like this you do need a fairly powerful PC and Kevin recommends a 486/66 or Pentium processor with DOS 3 or higher a SVGA VESA display with 640 x 480 and 1024 x 768 resolutions. If you would like to try a copy it's available on the Internet in shareware form at any of the simtel mirror sites in directory /msdos/hamradio/sbfft12.zip. I found my copy in: **ftp.funet.fi/pub/ham/simtel/msdos/hamradio/sbfft12.zip** If you like the program don't forget to tell the author and register. My thanks to Kevin McWilliams for creating the program.

Wefax For Win

Les Crossan has written with an update on this new software package that he's putting together. It's now at version 0.99C1 and he promises that when it gets to version 1.0 he will release it so we can all join in the fun. In essence this program is likely to be just about the first that will enable FAX reception under Windows. I've shown a sample FAX in the column so you can judge for yourself the quality of the received image. As soon as it's finished I'll let you know how to lay your hands on a copy.

Offenbach Weather Fax Schedule

This popular met station has just released its latest schedule of FAX transmissions so here it is for reference. The stations sends its output to three transmitters as follows:
DDH3, 3.855MHz, 800W
DDK3, 7.880MHz, 20kW
DDK6, 13.8825MHz, 20kW
Each station uses a shift of +425Hz for white and -425Hz for black. The detailed schedule follows:

Time UTC	Chart Detail
0430	Surface weather chart
0512	H +24 surface pressure
0525	Repeat of 0430 chart
0546	H +12, H +24 (EMV) 500 hPa H+T surface
0559	H +12, H +24 (EMV) 850 hPa T, 700 hPa f
0612	H +36, H +48 (EMV) 500 hPa H + T surface
0625	H +36, H +48 (EMV) 850 hPa T, 700 hPa f
0638	H +36, H +48 (EM) 500 hPa H + T surface p
0651	H +36, H +48 (EM) 850 hPa T, 700 hPa f
0704	H +60, H +72 (EM) 500 hPa H + T surface
0717	H +60, H +72 (EM) 850 hPa T, 700 hPa f
0730	Repeat of 0512
0745	Surface pressure analysis
0808	H +48 (EM) surface pressure
0821	H +72 (EM) surface pressure
0834	H +96 (GM) surface pressure
0945	Sea surface temperature North Sea
1007	Ice conditions chart
1029	Wave predictions
1050	Surface weather chart
1111	Transmission schedule
1124	Test chart
1520	Ice conditions chart
1541	Ice conditions chart
1600	Surface weather chart
1810	Surface pressure analysis
1832	H +24 surface pressure
1845	repeat of 0808
1900	repeat of 0829
1915	Sea ice observations
2115	Ice conditions chart
2136	repeat of 1029
2200	Surface weather chart

Missing Person

During the clear-up of outstanding readers offers I'm left with a package for a **Mr M. R. Gardiner** of Augustus Close but that's all the address I have! Would Mr Gardiner please make contact and I will forward his goods.

Utility Macros

Barry Stone enjoyed my recent feature on a specialist configuration file for Hamcomm and reminded me about the facility to record macros within *Hamcomm*. To many that are new to computing the whole idea of macros may well appear to be some form of black art that's best left to the experts.

This is an ideal opportunity for me to tell you about the benefits of macros and how to use them. If you look up the word macro in the dictionary you won't find much help as most explain macro as being used to refer to or describe things that are large in size or scope (the definition comes from the BBC English Dictionary which is really excellent). So what does macro mean in computing terms? The simplest way I can think to describe it, is a way of grouping together a number of instructions or keystrokes so that they can be automatically carried-out. Let's try an example to help make it a little clearer. If you use *Hamcomm* and want to change from AMTOR to 50 baud, 400Hz shift RTTY you would have to first set the mode to RTTY (Baudot), then set the speed and finally set the shift. You can do this quite quickly using the keyboard shortcuts i.e. Alt M B to set the mode. But it would be even better if you could just press one key combination to do all of this. By using a macro you can do just that and so save a lot of time.

So how do we set about creating a macro? With *Hamcomm* it's dead easy as there's a macro recorder included with the program. All you do is go to the File menu and select Record Macro and follow the instructions to start the recording. You then press the key combinations that you want to store. When you've finished you just press 'Alt' and the number key where you want to store the macro.

To replay the macro that you've stored you just press 'Alt' and the required number key. The best way to learn is to try it so why not have a go now.

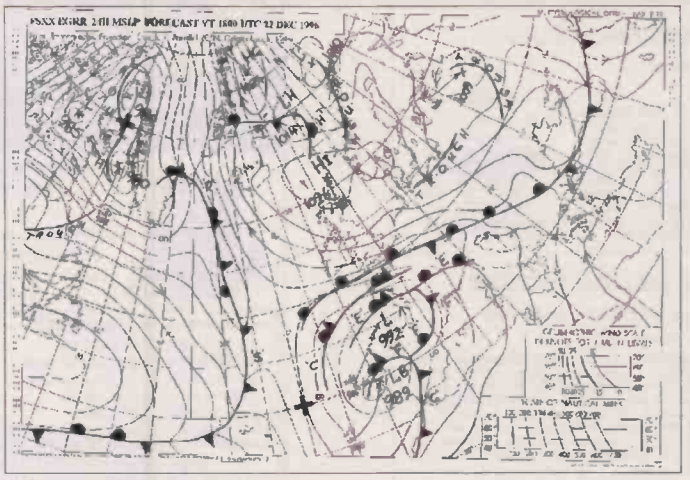
One of the first things you'll notice is the speed of the macro execution - it really is quick. Did it work? If not make sure you only used the keyboard to enter details of the macro as *Hamcomm*'s macros don't store mouse movements.

With *Hamcomm* you can store up to 10 macros using the combination 'Alt 1' through to 'Alt 0'. Of course, the next problem is remembering what macro you've stored where. A simple solution is to cut a strip of stiff card that you can mount just above the number keys on your keyboard. You can then write details of the macro on the card. Once you've created your macro *Hamcomm* has the facility to .....save it to disk for use on another occasion.

You can save as many macros as you like so you could get really clever and have different macros for different listening modes. If you do this you will need a number of different reminder strips to put above you number keys - don't forget to use both sides of the strip!

Just to get you started here's a few macros that I find useful:
45.5baud, 170Hz shift, RTTY = 'Alt mb' 'Alt sa' 'Alt k1'
50 baud, 400Hz shift, RTTY = 'Alt mb' 'Alt sb' 'Alt ks400'
75 baud, 400Hz shift, RTTY = 'Alt mb' 'Alt sc' 'Alt ks400'

Although I've concentrated on *Hamcomm*, the basic facility of being able to record often used keystrokes exists in lots of different computer programs. If you've put together what you think is an interesting combination of macros why not drop me a line with the details so I can print them here.



Wefax for window chart

New Klingenfuss Releases

The *1997 Guide to Utility Radio Stations* is now on general release. This book has become very well established and remains the single most up-to-date reference for utility listeners. Although it is most well known for its frequency listing, it contains a host of other invaluable information that should not be overlooked.. For example there's a full listing of FAX schedules that's shown grouped by country. There's also a real gem in the chronological listing of press stations. This splits the day into 30 minute segments and shows the stations that are scheduled to transmit.

As well as the station name and call, all the active frequencies are shown along with the language used. I've always found this section very useful.

The guide also contains a very comprehensive callsign listing along with the latest QSL addresses for all the major utilities. One thing that you mustn't do is expect to be able to hear all the stations that are listed! The guide is more commonly used as a reference to help identify a newly discovered station. Despite its rising price there is no real alternative for the experienced listener.

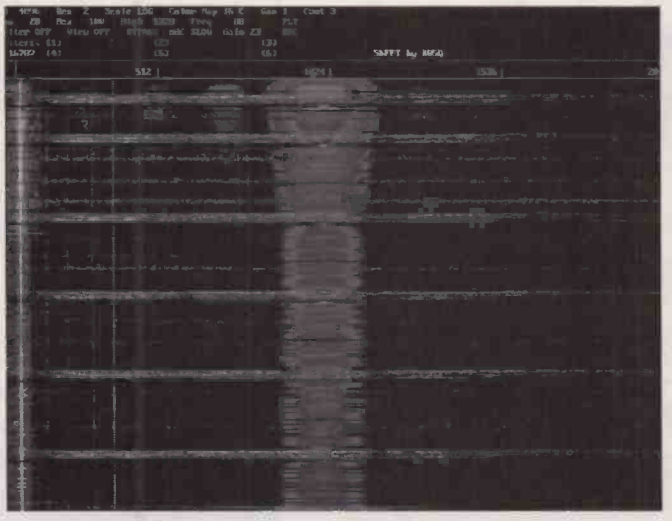
Launched at the same time as the Utility Guide is a brand new publication - *The 1997 Shortwave Frequency Guide*. In the introduction Joerg explains the rationale for the new book as being to produce a timely publication that includes a combined list of broadcast and utility stations that includes the very latest 1997 broadcasting schedules. I believe this is likely to be a real winner as not only is the content good, but the price is also very attractive.

In order to make the book easy to use it has been simplified into two main sections, the first is a straightforward listing of utility stations by frequency. Each line of the listing shows the frequency, callsign, station, country, mode plus a few notes that covers details of the utility mode. The layout of the list had been well thought out and was easy to read.

The broadcast stations listing is similar, but in this case the list shows frequency, station, location, IYU, start/end times, language, target area and a few helpful notes.

The main sections were supplemented with an introductory section on utilities and a comprehensive list of abbreviations. Overall this was a very attractive package that fills a gap in the market for a combined utility and broadcast frequency listing.

Both books are available from the *SWM* Book Service and my thanks are due to Joerg Klingenfuss for supplying the review copies.



SBFFT spectral display

Readers Special Offers

If you'd like a copy of Hamcomm/JVFAX, etc. I've arranged a very special offer with the Public Domain and Shareware Library (PDSL). They have put together a library set of all five disks for just £12.00, all inclusive. Using PDSL also makes ordering simpler as they accept all the usual credit cards so you can order by phone - you don't even have to write a letter. Please direct all orders and enquiries about this disk set to **PDSL Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. Tel. (01892) 663298** and request library volume:H008739abcde. IBM PC Software(1.44Mb disks):
Disk A - JVFAX 7.0, HAMCOMM 3.1 and WXFAX 3.2
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LW Maritime

Radio Beacons

Much to the delight of DXers the conditions at night were often favourable during October, November and December. Extensive logs were compiled by some listeners and there are many interesting entries in the chart.

Due to variations in propagation, one cannot be sure that the sky waves from any particular beacon will reach the UK at night. Those from Punta D. Penna, Italy (TL) on 314.5 were received on one evening only by **Peter Polson** in St.Andrews. The beacons at Cabo Carvoeiro Lt, Portugal (CV) on 287.5 and Punta de Llobregat, S.Spain (OR) on 303.5 were heard for the first time by **Steve Cann** in Southampton. Good reception from Iceland and Greenland was noted at night by **Peter Rycraft** in Wickham Market. On October 5 **Dave Dawson** (Birmingham) was surprised to find the beacon at Prinz Christian Sund, Greenland (OZN) on 372.0 still audible thirty minutes after sunrise!

Whilst searching the band in Edinburgh, **Kenneth Buck** discovered that Ingolfshofdhi Lt, Iceland (IN) is not the only beacon with that ident on 316.0 - the other is an aero one in Denmark! Both are amplitude modulated (400Hz) but Ingolfshofdi keys the ident several times and then radiates tone for about 50sec.

A very welcome first report came from **Patrick Vignoud** in Pontcharra, which is in the heart of the French Alps. High mountains surround his house and he has great difficulty in receiving any of the beacons. Although some reach him via sky wave paths at night none are detectable during daylight.

Local electrical interference often troubled **John Woodcock** in Basingstoke but he managed to log 26 beacons. Similar problems were encountered late at night by **John Wells** in E.Grinstead, so he searched the band in the daytime or early evening. He heard for the first time the Norwegian beacons at Skrova Lt (KN) on 296.0 and Halten Lt (HA) on 313.0.

The ground waves from two beacons in Holland were picked up by **Eric Tubman** (Whitstable) for the first time - Ameland Lt (AD) on 299.0 and Vlieland Lt (VL) on 303.5. Three listeners noticed that the beacon at Pt. St.Mathieu Lt, France (SM) had moved to 291.0, but several others logged it on 292.5. It is not known if this change is intentional or due to a transmitter fault, so it is still listed on 292.5 in the chart.

DXers:-
(A) Kenneth Buck, Edinburgh.
(B) Steve Cann, Southampton.
(C) Robert Connolly, Kilkeel.
(D) Dave Dawson, Birmingham.
(E) John Eaton, Woking.
(F) Brian Heath, Stapleton.
(G) Tim McClellan, Christchurch.
(H) George Millmore, Wootton, IoW.
(I) Albert Moore, Douglas, IoM.
(J) Fred Pallant, Stornington.
(K) Peter Pollard, Rugby.
(L) Peter Polson, St.Andrews.
(M) Victor Robb, Belfast.
(N) Peter Rycraft, Wickham Market.
(O) Tom Smyth, Co.Fermanagh.
(P) Philip Townsend, E.London.
(Q) Eric Tubman, Whitstable.
(R) Patrick Vignoud, Pontcharra, France.
(S) John Wells, E.Grinstead.
(T) Peter Westwood, Farnham.
(U) John Woodcock, Basingstoke.
(V) Ross Workman, Shoreham-by-Sea.

Long Wave Maritime Radiobeacon Chart

Freq (kHz)	C/S	Station Name	Location	DXer
284.5	LZ	Lizard Lt	S.Cornwall	A,C,D,H,I,J,N*,S,U,V
284.5	MA	Cabo Machichaco	N.Spain	B*,C*,D*,E*,F*,I,K*,L*,M,N*,R*,S,V*
284.5	PR	Porkkala	Finland	D*,L*,N*
285.0	NO	Cabo de la Nao Lt	S.Spain	C*,V*
285.0	NP	Nieupoort W.Pier	Belgium	N*,P,S
286.0	TR	Tuskar Rock Lt	S.Ireland	A,B*,C,D,E*,F,H,I,K*,L*,M,N*,P*,S,U,V
286.5	AL	Almagrundet Lt	Sweden	K*,L*,N*
286.5	BY	#Baily Lt	S.Ireland	C,I,O
286.5	FI	Cala Figuera	Majorca	B*,C*,E*,F*,I*,K*,M,N*,R*,V*
286.5	FT	Cap Ferret Lt	W.France	B*,C,D*,I*,K*,N*,R*,U,V*
286.5	NK	Inchkeith Lt	F of Forth	A,L*
287.3	IB	I.Berlenga	Portugal	N*
287.3	LE	Leba Rear	Poland	N*
287.3	OD	Swinoujscie	Poland	N*
287.5	CV	Cabo Carvoeiro Lt	Portugal	B*
287.5	FR	Faerder Lt	Norway	C*,L*
287.5	MD	Cabo Mondego	Portugal	C
287.5	SE	Sete Mt St Clair	S.France	C*
288.0	HH	Hoek van Holland	Holland	C,N*,S
288.0	KL	Sklinna Lt	Norway	C*,L*,N*
288.0	OH	Old Hd of Kinsale	S.Ireland	C*,D*,I*,M
288.5	FI	Cabo Finisterre Lt	N.W.Spain	B*,C,D*,I*,L*,N*,V*
288.5	UD	Cabo Salou	S.Spain	N*,R*
288.5	YM	Ijmuiden Lt	Holland	E*,D,F,N*,P,S
289.0	BL	Butt of Lewis Lt	Is of Lewis	L*
289.0	BY	Baily Lt	S.Ireland	B*,C,D,A,I,M,N*,O
289.5	KY	Olsoy Lt	Norway	L*
289.5	LO	Landsort S Lt	Sweden	D*,I*,L*
289.5	MN	Hammerodde	Denmark	C*
289.5	NP	Punta Carena	Italy	C*
289.5	SN	Ile de Sein NW Lt	France	B*,E,H,J,N*,P,S,V
290.0	AV	Aveiro	Portugal	C*
290.0	FD	Fidra Lt	F of Forth	A,C*,I*,L*
290.0	MR	Montedor	Portugal	C*
290.5	DY	Duncansby Hd Lt	NE.Scotland	A,L*
290.5	LL	Hallo Lt	Sweden	B*,D*,E*,L*,N*
290.5	SB	S.Bishop Lt	Pembroke	B,C,D,F,G,H,I,J,K*,M,N*,O*,P,S,T,U,V
290.5	VI	Cabo Villano Lt	N.Spain	A*,B*,C*,D*,E*,F,G*,I,K*,L*,M*,N*,O,P*,Q*,R*,S,V
290.5	VY	Visby	Sweden	N*
291.0	CF	Capo Ferro	Sardinia	E*,N*
291.0	SN	Cabo San Sebastian	S.Spain	C*
291.0	TG	Torsvag Lt, Koja	Norway	N*
291.5	MA	O.Matveyev	SSR Arctic	L*
291.5	MR	Mersrags	Latvia	N*
291.5	SU	South Rock LV	Co.Down	A,B*,C,D*,F,I,K*,L*,M,O,P,S,V
291.9	LT	La Isleta	Canaries	C*
291.9	NA	Punta Lantailla	Canaries	C*
292.0	MH	Mahon, Minorca	Balearic Is	R*,V*
292.0	SJ	Souter Lt	Sunderland	A,C,D,F,I,K*,L*,M,N*,O,P,S
292.0	TO	Torungen Lt	Norway	D*,L*
292.5	SM	Pt St.Mathieu Lt	France	B,C,D,E,F,G,H,J,K*,L*,M*,N*,P,S,T,U,V
293.0	CP	St.Catherine's Lt	I.O.W.	B,D*,E*,F*,G,H,J*,J*,K*,N*,P,S,T,U,V
293.0	RN	Rhinns of Islay Lt	Is of Islay	A,C,I,L*,M,O
293.0	SY	Svinoy Lt	Norway	A,C*,L*
293.5	RO	Cabo Silleiro Lt	N.Spain	C*,R*
294.0	KU	Kullen High Lt	Sweden	C*,I*,K*,N*
294.0	PH	Cap d'Alprech	France	A,B,C,D*,E*,F,G,H,I,J*,K*,M,N*,P,Q,S,T,V
294.5	BA	#Black Hd Lt	N.Ireland	C*,O
294.5	MH	Mohni Lt	Estonia	C*
294.5	PA	Pakrineem Lt	Estonia	C*
294.5	PS	#Pt.Lynas Lt	Anglesey	C,I,O
294.5	PT	#Souter Lt	Durham	A
294.5	UK	Sunk Lt V	Off Essex	B*,D*,E*,F*,K*,N*,P,Q,S,T,U,V
295.0	DV	Djupivogur	Iceland	C*
295.0	JA	Jaroslawiec	Poland	C*,D*,I*,K*,L*,T*
295.0	SN	Sletnes Lt	Norway	C*,N*
295.5	CB	La Corbiere Lt	Jersey C.I.	B*,N*,S,V
295.5	CR	Cap Couronne	France	C*,N*,R*
295.5	RE	La Rochelle	France	C,N*
296.0	BH	Blavandshuk Lt	Denmark	A,C*,D*,I,L*,N*,P*
296.0	GR	Goeree Lt	Holland	N*,P,S
296.0	KN	Skrova Lt	Norway	B*,C*,E*,L*,S
297.0	FG	Pt de Barfleur Lt	France	B,C*,D*,E*,F*,G,H,K*,J*,L*,M,N*,P,Q,S,T,U,V
297.5	MA	Mantyluoto	Finland	D*
297.5	PS	Cabo Penas Lt	N.Spain	C,D*,L*,R*,V*
298.0	GX	Ile de Groix	France	B*,C*,I*,J*,K*,L*,P,S,U,V
298.0	TA	Cabo Gata	S.Spain	N*
298.5	RR	Round Is Lt	Is Scilly	A,B*,C,D*,E*,F*,G,H,I,J*,K*,L*,M,N*,O*,P,R*,S,T,U,V
298.5	SW	Skagen	Denmark	C
299.0	AD	Ameland Lt	Holland	A,N*,Q,S
299.0	BN	Les Baleines	W.France	C*,N*
299.0	O	Tarifa	S.Spain	C*
299.0	UN	Understen Lt	Sweden	L*
299.5	NP	Nash Pt Lt	S.Wales	B*,C,D,E,G,I,J*,M,N*,P,S*,T,U,V
299.5	SK	Skomvaer Lt, Rost	Norway	C*,K*,L*
299.5	VR	Utvaer Lt	Norway	A,C*,I*,L*,N*
299.5	VS	Vieste Lt	Italy	N*
300.0	MZ	Mizen Head	S.Ireland	C,D*,I*,J*,N*,S
300.0	TI	Cap d'Antifer Lt	N.France	B*,H,N*,V
300.5	DU	Dungeness Lt	Kent	D,E*,F*,G,H,I,J,K*,N*,P,Q,S*,T,U,V
300.5	LA	Lista	Norway	A,B*,C*,I*,K*,L*,M*,N*
301.0	CA	Pt de Creach	France	B*,C,D,E*,F*,G,H,I,K*,L*,M,N*,P,S*,T,U,V
301.0	ER	Eierland Lt	Holland	C*
301.1	RG	Raufarhoefn	Iceland	N*
301.5	KD	Kinnards Hd Lt	NE.Scotland	A,C*,I*,L*,S
301.5	L	Torre de Hercules	N.Spain	B*,C*,K*
301.5	OB	Hoburg	Sweden	C*,I*,N*
302.0	RB	Cherbourg Ft W Lt	France	B,C,D*,E,F*,G,H,J*,K*,N*,P,S*,T,U,V
303.0	D	Rota	SW Spain	C*,N*
303.0	FB	Flamborough Hd Lt	Yorkshire	A,C,D*,E,F*,I,L*,M,N*,P,S*,U,V
303.0	FV	Falsterborev Lt	Sweden	A,C*,D*,I*,L*,T*
303.0	YE	Ile d'Yeu Main Lt	France	B*,C*,G*,H,I*,J*,K*,L*,N*,S,V
303.4	MA	Malarrif Lt	Iceland	E*
303.4	VC	Cape St.Vincent	Portugal	N*
303.5	BJ	Bjornsund Lt	Norway	A,B*,C*,D*,F*,E*,I*,K*,L*,U
303.5	FN	Feistein Lt	Norway	A,L*,N*,O*
303.5	IA	Llanes Lt	N.Spain	C*,N*
303.5	OR	Punta de Llobregat	S.Spain	B*,C*,R*
303.5	VL	Vlieland Lt	Holland	C*,D,E,F,I,L*,N*,P,Q,S*,T,U,V
304.0	ME	Punta D.Maestra	Italy	R*
304.0	PS	Pt Lynas Lt	Anglesey	A,B*,C,D*,E*,F*,I,K*,L*,M,N*,P*,S*,V*
304.0	SB	Sumburgh Hd Lt	Shetland Is	L*
304.5	MY	Cabo Mayor Lt	N.Spain	D*,N*,R*,V
305.0	FP	Fife Ness Lt	SE.Scotland	A,B*,C,D*,F,I,K*,L*,M,S*
305.0	GL	Ile de Giraglia Lt	Corsica	N*
305.5	AL	Pt d'Ailly Lt	France	B*,C,D*,E*,F*,G,H,I,J,K*,L*,M,N*,P,Q,R*,S*,T,U,V
305.7	DA	Dalatangi Lt	Iceland	B*,L*
306.0	FN	Walney Is Lt	Off Lancs	A,C,D*,F*,I,K*,L*,M,N*,O*,P,S
306.0	TN	Thyboron	Denmark	A,L*,N*
306.5	GJ	Le Grand Jardin Lt	France	N*,V
306.5	H	Hel Lt	Poland	O*
306.5	OR	O.Osmussaar	Estonia	C*
306.5	RS	Ristna	Estonia	C*,D*,F*,I*,L*,M,N*
306.5	SY	Sorve	Estonia	C*
306.5	UT	Utsira	Norway	A,B*,C*,D*,E*,F*,I,K*,L*,M*,N*,P,S*
307.0	GL	Eagle Is Lt	Ireland	C,D*,K*,L*,M,N*,O
308.0	PI	Cabo Espichel	Portugal	C*
308.0	RC	Cabo Roca	Portugal	C,N*
308.0	RD	Roches Douvres Lt	France	C,K*,N*
308.0	SN	Cabo de Sines Lt	Portugal	N*
308.5	NZ	St Nazaire	France	B*,C*,E*,I*,L*,M*,P,S,V
309.5	BA	Punta Estaca Bares	N.Spain	C*,D*,I,K*,L*,M*,N*,R*
309.5	FH	Fruholmen Lt	Norway	C*,M
309.5	MA	Marstein Lt	Norway	A,B*,C*,E*,I,K*,L*,M,N*,S*
309.5	PB	Portland Bill Lt	Dorset	B*,D,E*,F*,G,H,I,J,K*,M,N*,P,S*,U,V
310.0	ER	Pt de Ver Lt	N.France	B*,C*,E,H,J,P,S*,U,V
310.0	IP	Capo Sandalo Lt	Sardinia	R*
310.3	GV	Goltur	Iceland	E,N*
310.5	BO	Bokfjord Lt	Norway	C*,N*
310.5	SG	Sjaellands N Lt	Denmark	C,L*
311.0	GD	Girdle Ness Lt	NE.Scotland	A,C,L*,M
311.0	NF	N.Foreland Lt	Kent	B*,C*,D*,E*,F*,H,I,K*,M,N*,P,Q,S*,T,U,V
311.5	LP	Loop Hd Lt	S.Ireland	B*,C,I*
312.0	HO	Tennholmen Lt	Norway	L*,M*,N*
312.0	OE	Oostende	Belgium	C*,D,F*,K*,M,N*,O,P,S*,V
312.0	UH	Eckmuhl Lt	France	B*,C*
312.5	AK	Akmenrags	Latvia	C*
312.5	BK	Baltiysk	Russia	C*,E*,L*
312.5	BT	Mys Taran Lt	Russia	C*,L*
312.5	CS	Calais Main Lt	France	C,E*,H,N*,Q,S*
312.5	DB	Doobskiy	Ukraine	C*
312.5	KA	Klaipeda Rear Lt	Lithuania	C*,N*
312.5	LB	Liepaja	Latvia	C*
312.5	SR	Skardsfjara	Iceland	C*,K*
312.5	VS	Cabo Estay Lt	N.Spain	K*,M,N*,T
312.6	KB	Krautsand	Germany	F*
313.0	HA	Halten Lt	Norway	C*,D*,L*,N*,S*
313.0	PA	Cabo de Palos Lt	S.Spain	B*,C*,D*,E*,F*,G*,I*,K*,N*,R*,V*
313.0	TY	Tory Is Lt	N.Ireland	A,C,I,L*,M
313.5	BR	Cap Bear Lt	S.France	B*,C*,E*,R*
313.5	CM	Cromer Lt	Norfolk	B,D*,E*,F*,I,K*,L*,N*,P,Q,S*,T,U,V
313.5	OG	Olands Sodra Grund	Sweden	C*
314.0	HK	Heklingen Lt	Norway	L*
314.0	PQ	Porquerolles	S.France	B*,C,N*,R*
314.0	VG	Ile Vierge Lt	France	A,B*,C,D*,E,F*,G,H,I,K*,L*,M*,N*,O*,P,Q*,S*,T,U,V
314.5	SK	Strandhofn	Iceland	C*,N*
314.5	TL	Punta D.Penna	Italy	B*,C*,K*,L*,M*
315.5	ND	Nidden	Lithuania	C*
316.0	IN	Ingolfshofdhi Lt	Iceland	A*,B*,C*,D*,I*,L*,M*,N*
319.0	LEC	Stavanger	Norway	A,B*,C,D*,E*,F*,G,H,I,K*,L*,M,N*,O*,P,Q,S*,T,U,V*
328.0	HB	Holsteinborg	Greenland	N*
331.0	FH	Frederikshab	Greenland	N*
337.0	MY	Myggenaes	Faeroe Is	A*
367.0	JV	Jakobshavn	Greenland	C*
372.0	OZN	Prins Chris's Sund	Greenland	B*,C*,O,I*,K*,M*,N*,U
381.0	AB	Akraberg	Faeroe Is	A*,B*,C*,D*,E*,F*,I,K*,M,N*,U*,V*
399.0	UP	Upernavik	Greenland	N*
404.0	NL	Nolso	Faeroe Is	A*,B*,C*,D*,E*,F*,I*,K*,M,N*,V*

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

Brian Oddy G3FEX, Three Corners, Merryfield Way, Storrington, West Sussex RH20 4NS

LM&S

Long, Medium and Short Waves

For most purposes Universal Time Co-ordinated (UTC), as used by the international s.w. broadcasters, is the same as Greenwich Mean Time (GMT). At present GMT is indicated by clocks in the UK.

On March 30th UK clocks will be advanced by one hour to display British Summer Time (BST) but s.w. broadcast schedules and LM&S will continue to quote transmission times in UTC. To avoid confusion, place a clock by your receiver now and set it to UTC (=GMT). Do not alter it on the 30th.

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 December. A broadcast from Radiodiffusion-TV Morocco (RTM) via Azilal (800kW) on 207kHz was received at 2211UTC by **Eddie McKeown** in Newry, Co.Down. It was competing quite strongly with co-channel DLF via Munich (500kW) and rated SINPO 22222. By listening to it for about 15 minutes he was able to confirm the identity.

The Radiotelevisione Italiana (RAI) 10kW outlet at Caltanisseta, Italy on 189kHz was heard during some evenings - see chart. At 2044 on December 21, **Fred Pallant** (Storrington) logged it as 14333.

Over in Canada, **Alan Roberts** (Quebec) picked up a weak modulated carrier on 177kHz at 0100 on January 9. Six time pips were heard and then a man spoke in a language which sounded like German but Alan could not be sure because the signal rated only SIO131. It was probably DeutschlandRadio Berlin via Oranienburg (250kW), who still use that off-set frequency.

Medium Wave Reports

Some of the m.w. stations in E.Canada and E.USA were received in the UK after dark - see chart. Favourable conditions were noted on December 2, 3 & 7 by **Tony Stickells** in Thornton Heath. He spent part of December in Suevres, France but transatlantic signals were noticeably absent there - WNRB in Boston, MA on 1510 was the only station positively identified.

Between 0135 and 0210 on the 8th, **Robert Connolly** (Kilkeel) logged CKVO on 710 as 22322; also WINS on 1010, WTOP on 1500 and WWRL on 1600 - they all rated 32322. During the early hours of the 8th & 9th **Eric Duncan** (St.Andrews) compiled an extensive log which included CFRB in Toronto on 1010, audible when WINS faded out at 0030 and WHAS in Louisville, KY on 840, heard at 0128. Up in Shetland **John Sadler** (Scalloway) found reception good after sunrise on the 9th - at 0905 he logged WBBR on 1130 as SIO444. The conditions that morning surprised **David Edwardson** in Wallsend - at 0959 he logged WNRB on 1510 as 24542.

During the second half of the month the conditions were often favourable, especially from the 19th to 21st and on the 31st. An extensive log was compiled by **Paul Crankshaw** (Troon). Many of the entries were heard around dawn or later! At 0900 on the 31st he listened to CJOB in Winnipeg, MB on 680, with a weather report (clear and -22C) and a news bulletin.

Quite a few of the broadcasts from the Middle East and N.Africa reached the UK after dark - see chart. Unusual conditions were often present before dusk which enabled many European stations to be heard.

For some time now there have been reports of broadcasts in German on 1539 but no definite ident has been mentioned. **Ted Harris** (Manchester) has been using his knowledge of German to monitor them. He heard the ident ERF (Evangeliums Rundfunk) and 'das Zuhor radio', also an address was given, so he wrote to them. He has received a reply, which indicates that they (ERF) have been using the Mainflingen transmitter (700kW) since 1 April '96. Currently it is being operated at 350kW from 0400 until 2300UTC.

Ground waves from the new ILR Valleys Radio outlet on 1116 were picked up during daylight by **Ronald Jefferies** in Berkeley and **Chris Ridley** in Co.Sligo, Eire. Reports from other areas would be very welcome here.

Short Wave Reports

The propagation conditions in the **25MHz (11m)** band are so unreliable that international broadcasters are unlikely to use it during 1997.

Despite daily variations in propagation the **21MHz (13m)** band is being used by a number of broadcasters. They include UAER, Dubai 21.605 (Ar to Eur 0615-1030) rated 45454 at 0832 in Newry; R.Australia via Darwin 21.725 (Eng to Asia 0630-1100) 35543 at 0832 in Wallsend; 54444 at 0939 by **Tom Winzor** in Plymouth & 35433 at 1007 by **Darren Beasley** in Bridgwater; R.Prague via Litomysl 21.705 (Eng to S.Asia, W.Africa 1000-1030) 33333 at 1000 by **Chris Shorten** in Norwich; UAER, Dubai 21.605 (Eng to Eur 1030-1055) 35333 at 1038 by **Tim Allison** in Middlesbrough; RFI via Issoudun 21.620 (Fr to E.Africa 0800-1500?) 13341 at 1105 by **Eric Shaw** in Chester; BSKSA Saudi Arabia 21.495 (Ar [Holy Quran] to S.E.Asia 0900-1200) SIO344 at 1130 by **Phil Townsend** in E.London; REE via Noblejas 21.570 (Sp to S.America 1200-1800) 34343 at 1202 by **John Eaton** in Woking; RFI via Allouis? 21.580 (Fr to Africa? 0900?-1500?) 24322 at 1225 by **Rhoderick Illman** in Oxted; BBC via Limassol, Cyprus 21.470 (Eng to E.Africa 1300-1700) 23322 at 1330 in Kilkeel; BBC via Ascension Is 21.660 (Eng to W/E/S.Africa 1100-1700) 34433 at 1545 by **Stan Evans** in Herstmonceux; WYFR via Okeechobee, USA 21.525 (Eng, Fr, Ger, Port to W.Africa 1600-2045) 45444 at 1632 by **Michael Griffin** in Ross-on-Wye.

The conditions also vary daily in the **17MHz (16m)** band. During the morning R.Australia via Darwin 17.715 (Eng to Asia, Pacific 0200-0858) was SIO233 at 0738 in Woking; DW via Rwanda? 17.800 (Eng to Africa 0900-0950) 25433 at 0949 in Middlesbrough; V of Russia 17.860 (Eng [WS] to Asia) 55544 at 0955 in Herstmonceux; AIR via Bangalore 17.387 (Eng to Asia 1000-1100) 44333 at 1030 in Scalloway; R.Pakistan, Islamabad 17.900 (Eng to Eur 1100-1120) 35433 at 1107 in Bridgwater; BBC via Skelton, UK 17.640 (Eng to Eur 0700-1500) SIO333 at 1115 in E.London; R.Kuwait via Kabd 17.885 (Ar to Far East 0900-1505) 33333 at 1200 in Kilkeel.

After mid-day Africa No.1, Gabon 17.630 (Fr to W.Africa 0700-1600) was 33333 at 1239 in Oxted; UAER Abu Dhabi 17.760 (Ar to Far East 0900-1355) SIO433 at 1245 by **Philip Rambaut** in Macclesfield; RFI via Moyabi, Gabon 17.560 (Eng to M.East 1400-1500) 43333 at 1412 in Norwich; DW via Antigua, W.Indies 17.765 (Ger to S.America 1200-1700) 34233 at 1459 by **Peter Pollard** in Rugby; RAI via 17.780 (It [R.Uno] to America 1330?-1630? Sun) 34543 at 1501 in Wallsend; BBC via Ascension Is 17.830 (Eng to W/C.Africa 0730-2100) 34443 at 1600 in Chester; BBC via Antigua, W.Indies 17.840 (Eng to N/C.America 1400-1700) SIO222 at 1600 by **Tom Smyth** in Co.Fermanagh; WYFR via Okeechobee, USA 17.555 (Eng to Eur 1800-1955?) 44544 at 1622 in Ross-on-Wye; R.Nederlands via Bonaire 17.605 (Eng to S/E/W.Africa 1830-2025) 35312 at 2012 in Newry.

Rather more reliable conditions prevail in the **15MHz (19m)** band. During the morning the Voice of Armenia, Yerevan 15.270 (Eng to Eur 0930-1000 Sun) rated 43443 at 0930 in Newry; AIR via ? 15.050 (Eng to NE.Asia 1000-1100) 33333 at 1000 by **Bernard Curtis** in Stalbridge; Voice of Malaysia, Kajang 15.295 (Mal to S.Asia 0830-1025) 33333 at 1000 in Scalloway; BBC via Masirah Is, Oman 15.310 (Eng to S.Asia 0300-0915, 1000-1500) 14332 at 1030 in Middlesbrough; R.Pakistan, Islamabad 15.470 (Eng to Eur 1100-1120) 54444 at 1105 in Norwich; BBC via Antigua, W.Indies 15.220 (Eng to C/S.America 1100-1400) 33433 at 1140 by **Tony Hall** in Freshwater Bay, IoW.

After mid-day RCI via Sackville, Canada 15.425 (Fr to C.America 1300-1400) was 33333 at 1340 in Kilkeel; BBC via Cyprus 15.565 (Eng to Eur 0730-1500) 45434 at 1340 in Ross-on-Wye; BBC via Skelton, UK 15.575 (Eng to Eur, M.East, W.Asia 0600-1800) 34443 at 1502 in Woking; R.Japan via Moyabi, Gabon 15.355 (Eng/Jap to S.Africa 1500-1600) 23322 at 1537 by **Vera Brindley** in Woodhall Spa; Channel Africa via Meyerton 15.240 (Eng to C/W Africa 1600-1700) 34444 at 1600 in Chester; WWCR Nashville, USA 15.685 (Eng to Eur 1100?-0000) 54433 at 1600 in Herstmonceux; China R.Int via Mali 15.130 (Eng to E/S.Africa 1600-1657) 25332 at 1630 in Bridgwater; WEWN Vandiver, USA 15.665 (Eng to Eur 1200-1756) 44333 at 1645 by **Sheila Hughes** in Morden; BBC via Ascension Is 15.400 (Eng to Africa 1430-2100) SIO344 at 1700 in E.London; VOA via Selebi-Phikwe, Botswana 15.445 (Eng to Africa

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listner
153	Bechar	Algeria	1000	G*,I*
153	Donebach DLF	Germany	500	B,C*,D,E*,F,G*,H*,I,J,K
162	Allouis	France	2000	B,C,D,E,F,G,H,I,J,K,L*
171	Nador Medi-1	Morocco	2000	G*,I*,J*,L*
171	B'shakovo etc	Russia	1200	B,C*,E,F,G,I,J*,K
171	Minsk	Belarus	1000	D
177	Oranienburg	Germany	750	B,C*,D,E*,F,G,I,J,K,L*
180	Polati	Turkey	1200	H*
183	Saarlouis	Germany	2000	B,C*,D,E,F,G,I,J,K
189	Caltanissetta	Italy	10	B*,G*,H*,J*
198	BBC R-4 via ?	UK	?	C,D,H,L*
198	Droitwich BBC	UK	500	B,E,F,I,J,K
207	Munich DLF	Germany	500	B,C*,D,E*,F,G,H*,I,J,K*
207	Azilal	Morocco	800	B*,D*,E*,G*,I*,J
216	Roumoules RMC	S.France	1400	B,C,D,E,F,G,H,I,J,K
225	Raszyn Resv	Poland	?	B,C*,D,E*,F,G*,H,I,J,K*
234	Beidweiler	Luxembourg	2000	B,C,D,E,F,G,H,I,J,K,L*
243	Kalundborg	Denmark	300	B,C,D,E,F,G,I,J,K
252	Tipaza	Algeria	1500	B,C*,F*,I*,J*
252	Atlantic 252	S.Ireland	500	A*,B,C*,D,E,F,G,H,I,J,K,L
261	Burg(R.Ropa)	Germany	200	B,C,D,F,G,I,J*,K
261	Taldom Moscow	Russia	2500	C*,I*
270	Topolna	Czech Rep	1500	B,C*,D,E,F,G,H,I,J,K*
279	Minsk	Belarus	500	B,C*,D,E*,F,G*,H,I*,J*,K*

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

Listeners:-
(A) Tim Allison, Middlesbrough.
(B) Paul Bowery, Burnham-on-Crouch.
(C) Sheila Hughes, Morden.
(D) Ronald Jefferies, Berkeley.
(E) Eddie McKeown, Newry.
(F) George Millmore, Wootton, IoW.
(G) Fred Pallant, Storrington.
(H) Tom Smyth, Co.Fermanagh.
(I) Tony Stickells, Thornton Heath.
(J) Tony Stickells, while in Suevres, France.
(K) Phil Townsend, E.London.
(L) Thomas Williams, Truro.

Medium Wave Chart

Freq. (kHz)	Station	Country	Power (kW)	Listener
520	Hof/Hurzburg (BR)	Germany	0.2	H*,K,O*,P
531	Ain Beida	Algeria	600/300	H*,I*,O*,P*
531	Torshavn	Faeroe Is.	100	B*,F*,Q
531	Leipzig	Germany	100	H,I
531	RNE5 via ?	Spain	?	G,O*
531	Beromunster	Switzerland	500	B,O*,G,I,O*,P
540	Wavre	Belgium	150/50	B,E,F*,G,H,I,K,O,P,Q
540	Solt	Hungary	2000	O*,P*
540	Sidi Bennour	Morocco	600	B*,H*,I*,K*,O*,P*
540	Vitoria(EI)	Spain	10	P
549	Les Trembles	Algeria	600	B*,G*,H*,I*,K*,O*,P*
549	Thumau (DLF)	Germany	200	B,D*,G,H,I,K,O*,P,Q
549	St.Petersburg	Russia	1000	G,Q
558	Espoo	Finland	100	H
558	RNE5 via ?	Spain	?	G*,H,I*,K,P
558	Cima di Dentro	Switzerland	300	P
567	Berlin	Germany	100	B*
567	Tullamore(RTE1)	Ireland (S)	500	B,D*,E,G,I,K,N,O*,P,Q
567	RNE5 via ?	Spain	?	H*,I*,O*
576	Vidin	Bulgaria	100	B*
576	Muhlacker(SDR)	Germany	500	G,H*,I,O*,Q
576	Riga	Latvia	500	I*
576	Braga	Portugal	10	G
576	Barcelona(RNE5)	Spain	50	B*,I*,O*,P*
585	Paris(FIP)	France	8	B,G,H*,I,K,O,P,Q
585	Madrid(RNE1)	Spain	200	B*,G*,H,I*,K*,O*,P*,Q*
585	Gafsa	Tunisia	350	P*
585	Dumfries(BBCScot)	UK	2	N,O*
594	Frankfurt(HR)	Germany	1000/400	B,F*,G,H,I,K,O*,P*,Q
594	Oujda-1	Morocco	100	I*,O*,P*
594	Muge	Portugal	100	G*,I*,O*
603	Lyon	France	300	O*,P
603	Sevilla(RNE5)	Spain	50	H*,I*,O*,P*
603	Sousse	Tunisia	10	P*
612	Athlone(RTE2)	Ireland (S)	100	B,D*,G,I,K,N,O*,Q
612	Sebaa Aioun	Morocco	300	O*,P*
612	RNE1 via ?	Spain	10	I*,O*,P*
621	Wavre	Belgium	80	B,D*,G,H*,I,O,P,Q
621	RNE1 via ?	Spain	10	K*,O*,P*
621	Barcelona(OCR)	Spain	50	H*,I*
630	Vigra	Norway	100	B,F*,G,H*,I*,O*
630	Timisoara	Romania	400	B
630	Tunis-Djedeida	Tunisia	600	B*,E*,H*,O*,P*
639	Praha(Liblice)	Czech	1500	B,D*,I,O*,P,Q
639	RNE1 via ?	Spain	?	G,H*,I*,K*,O*,P
648	RNE1 via ?	Spain	10	F,G*,O*,P*
648	Orfordness(BBC)	UK	500	B,D*,G,I,K,O,P,Q
657	Neubrandenburg(NORF)	Germany	250	B,H*,I,P*
657	Napoli	Italy	120	B,I*,O*,P
657	Madrid(RNE5)	Spain	20	B*,G,H*,I*,K*,O*,P*
657	Wrexham(BBCWales)	UK	2	B,D*,G,K,N,O
666	Tindouf	Algeria	5	P*
666	MesskirchRohrd(SWF)	Germany	150	B,H*,O,P,Q
666	Sitkunai(R.Vilnius)	Lithuania	500	B*,H*,O*,P*
666	Lisboa	Portugal	135	I*
666	Barcelona(COPE)	Spain	10	O,P*
675	Marseille	France	600	B,G,H*,O*,P
675	Lopic(R10 Gold)	Holland	120	B,D*,E,G,H*,I,K*,O,P,Q
684	Sevilla(RNE1)	Spain	500	B*,G,H*,I*,K*,O*,P*
684	Kairouan	Tunisia	10	P*
684	Avala(Beograd-1)	Yugoslavia	2000	B,H*,I*,O*,P*,Q
693	Tortosa(RNE1)	Spain	2	H*,O*,P*
693	Droitwich(BBC5)	UK	150	D*,G,I,K,O,P,Q
702	Flensburg(NDR)	Germany	5	B*,C*,O*,G,H*,O*,Q*
702	Monte Carlo	Monaco	40	I,P
702	TWR via Monte Carlo	Monaco	300	B
702	Sebaa-Aioun	Morocco	740	P*,Q
702	Slovensko 1 via ?	Slovak Rep.	?	O*
711	Rennes 1	France	300	B,E,G,H*,I,K*,O,P
711	Heidelberg	Germany	5	C*,O*
711	Laayoune	Morocco	600	I*,P*
711	Murcia(COPE)	Spain	5	P*
720	Langenberg	Germany	200	D*
720	Lisnagarvey(BBC4)	Ireland (N)	10	I,K,N
720	Norte	Portugal	100	H*,P*
720	Sfax	Tunisia	200	P*
720	Lots Rd,Ldn(BBC4)	UK	0.5	B,D*,G,I,O,P*
729	Cork(RTE1)	Ireland (S)	10	G,H*,I,K,N*,O*
729	RNE1 via ?	Spain	?	C*,G*,H*,I*,K*,O*,P
738	Paris	France	4	B,I,P
738	Poznan	Poland	300	B,H*,O*,P*,Q*
738	Barcelona(RNE1)	Spain	500	C*,F,H*,I*,K*,O*,P*,Q
747	Flevo(Hilv2)	Holland	400	B,C*,D*,E,G,H*,I,K,O,P,Q,R
747	Cadiz(RNE5)	Spain	10	H*
756	Braunschweig(DLF)	Germany	800/200	B,D*,G,H*,I,O*,P,Q*
756	Bilbao(EI)	Spain	5	H*,I,O*,P*
756	Redruth(BBC)	UK	2	I,N
765	Sottens	Switzerland	500	G,H*,I,K,O*,P,Q*
774	Bonn(WDR2)	Germany	5	O*
774	Enniskillen(BBC)	Ireland (N)	1	N
774	RNE1 via ?	Spain	?	H*,I*,K*,O*,P
783	Leipzig(MDR)	Germany	100	D,G,H*,I*,K,O*,P,Q
783	Miramar(R.Porto)	Portugal	100	H*
783	Dammam	Saudi Arabia	100	I*
792	Limoges	France	300	G,I*,O,P,Q*
792	Lingen(NDR)	Germany	5	D*,H*,O*
792	Sevilla(SER)	Spain	20	G*,I*,P*
792	Londonderry(BBC)	UK	1	N
801	Munchen-Ismaning	Germany	300	H*,K,O*,P,Q*
801	Ajlun	Jordan	2000	I*
801	RNE1 via ?	Spain	?	G*,H*,I*,O*,P*
810	Madrid(SER)	Spain	20	H*,K*,O*,P*
810	Westerglen(BBCScot)	UK	100	B,C*,D*,G,I,K,N,O,P,Q,R
819	Toulouse	France	50	H*
819	Trieste	Italy	25	E*,O*,P*
819	Warsaw	Poland	300	E*,H*,I,O*,P*
819	S.Sebastian(EI)	Spain	5	P*
828	Hannover(NDR)	Germany	100/5	G,H*
828	Rotterdam	Holland	20	B,H*,O
828	Barcelona(SER)	Spain	50	H*
837	Nancy	France	200	B,C,G,I,N*,O,P
837	COPE via ?	Spain	?	E*,G,H*,I*,O*,P*
846	Rome	Italy	540	G,I*,O*,P*
855	Berlin	Germany	100	H*,K*,O*
855	RNE1 via ?	Spain	?	G*,H*,I*,K*,O*,P*,Q
864	Santah	Egypt	500	I*,O*,P*
864	Paris	France	300	B,E,G,H*,I,K,O,P
864	Socuellamos(RNE1)	Spain	2	H*,K*,O*,P*
873	Frankfurt(AFN)	Germany	150	A,B,G*,H*,I*,O*,P*
873	Zaragoza(SER)	Spain	20	G*,H*,O*,P*
873	Enniskillen(R.UI)	UK	1	M*
882	COPE via ?	Spain	?	H*,I*,O*
882	Washford(BBCWales)	UK	100	B,G,I,K,O,P
891	Algiers	Algeria	600/300	H*,I*,K*,O*,P*
891	Huisberg	Netherlands	20	B,G,H*,I,K,O
891	Vila Moura	Portugal	10	O*
900	Brno(CRo2)	Czech Rep	25	H*,I*
900	Milan	Italy	600	G*,H*,O*,P,Q*
900	COPE via ?	Spain	?	H*,I*
909	B'mans Pk(BBC5)	UK	140	B,D*,I,K,N,O,P
909	Clevedon(BBC5)	UK	50	G
918	Plesivec(Sloven'nR)	Slovenia	600/100	G*,I*,O*,P*,Q*
918	Madrid(R.Jnt)	Spain	20	G*,H*,I*,O*,P*
927	Wolvertem	Belgium	300	B,G,H*,I,K,O,P
936	Bremen	Germany	100	B,D*,H*,I*,K,O*,Q*
936	Venezia	Italy	20	I*,O*,P*,Q*
936	RNE5 via ?	Spain	?	H*,O*,P*
945	Toulouse	France	300	G*,H*,O*,P,Q*
954	Brno (CRo2)	Czech Rep.	200	B*,I*,O*,P*
954	Madrid(Ci)	Spain	20	I*,O*,P*
963	Pori	Finland	600	G,H*,I,K,O*,P*
963	Tir Chonaill	Ireland (S)	10	K*,N
972	Hamburg(NDR)	Germany	300	B,G,H*,I*,K,O*,P
972	RNE1 via ?	Spain	?	H*,O*,P*
981	Alger	Algeria	600/300	B*,G,H*,I*,K*,O*,P*
981	Trieste	Italy	10	P*
981	Coimbra	Portugal	10	O*
990	Berlin	Germany	300	B,D*,H*,I*,O*,P*,Q*
990	Potenza	Italy	10	P*
990	R.Bilbao(SER)	Spain	10	G,O*,P*
990	Redmoss(BBC)	UK	1	H*,N,O
999	Torino	Italy	20	O*,P*
999	Madrid(COPE)	Spain	50	B*,G*,H*,K*,N,O*,P*,Q*
1008	SER via ?	Canaries/Spain	?	H*,K*,O*,P*
1008	Flevo(Hilv-5)	Holland	400	B,G,H*,I,K,O,P,R
1008	Aleksinac(B'grad-1)	Yugoslavia	400/200	P*
1017	Rheinsender(SWF)	Germany	600	B,D*,G,H*,I,K,N,O*,P,Q*
1017	RNE5 via ?	Spain	?	H*,O*
1026	Hassi-Messaoud	Algeria	5	P*
1026	Graz-Dobl	Austria	100	P*
1026	SER via ?	Spain	?	H*,P*
1035	RAI via ?	Italy	?	P
1035	Lisbon(Prog3)	Portugal	120	H*
1044	Dresden(MDR)	Germany	250	G,H*,I*,O*,P
1044	SER via ?	Spain	?	G,I*,O*,P*
1053	Zarogoza(COPE)	Spain	10	H*,O*,P*
1053	Talk R.UK via ?	UK	?	D*,G,I,K,N,O,P
1062	Kalundborg	Denmark	250	B,G,H,I,O,P,Q
1062	R.Uno via ?	Italy	?	G,O*,P*
1071	Brest	France	20	I
1071	Lille	France	40	B,G,H*,O,P
1071	Riga	Latvia	50	I*
1071	Bilbao(EI)	Spain	5	B*,G,H*,I*,O*,P
1071	Talk Radio UK via ?	UK	?	K,O
1080	Katowice	Poland	1500	H*,I*,O*,P
1080	SER via ?	Spain	?	G*,H*,I*,O,P*
1089	Adrar	Algeria	5	P*
1089	Krasnodar	Russia	300	H*
1089	Talk Radio UK via ?	UK	?	D*,G,I,K,N,O,P*
1098	Nitra(Jarok)	Slovakia	1500	B,G,H*,I*,K,O,P*
1098	RNE5 via ?	Spain	?	I*,O*
1107	AFN via ?	Germany	10	A*,G,H*,N,O*,P*
1107	Rome (RAI)	Italy	6	P*
1107	Talk R.UK via ?	UK	?	G,I,O,P*
1116	Bari	Italy	150	O*,P*
1116	Pontevedra(SER)	Spain	5	P*
1125	La Louviere	Belgium	20	B,H*,I,O
1125	Deanovec	Croatia	100	B*,O*,P*
1125	RNE5 via ?	Spain	?	G*,I*,O*,P*
1125	Llandrindod Wells	UK	1	G
1134	COPE via ?	Spain	2	G*,H*,I*,K,O*,P*
1134	Zadar(Croatian R)	Yugoslavia	600/1200	B*,G,H*,I*,O,P*,Q
1143	AFN via ?	Germany	1	H*,O*,P*
1143	Stuttgart(AFN)	Germany	10	G,I*
1143	Bolshakovo(Mayak)	Russia	150	B*
1143	COPE via ?	Spain	2	G*,H*,I*,O*,P*
1152	RNE5 via ?	Spain	10	H*,I*,P*
1161	Ain-Salah	Algeria	5	P*
1161	Strasbourg(Fr-Int)	France	200	B*,H*,I*,K,N,O,P
1179	Bacau	Romania	200	B*
1179	SER via ?	Spain	?	P*
1179	Solvesborg	Sweden	600	A*,B,F*,G,H*,I*,J*,K,O*,P*,R
1188	Kuurne	Belgium	5	B,H*,I*,O*,P
1188	Reichenbach(MDR)	Germany	5	B*,H*,O*
1188	Szolnok	Hungary	135	I*,O*,P*
1188	San Remo	Italy	6	P*
1197	Munich(VOA)	Germany	300	B*,H*,O*
1197	Virgin via ?	UK	?	G,I,K,N,O,P*,Q
1206	Bordeaux	France	300	B,H*,O,P
1206	Haifa	Israel	50	B*
1206	Wroclaw	Poland	200	H*,O*,P*
1215	COPE via ?	Spain	?	P*
1215	Virgin via ?	UK	?	G,I,K,N,O,P*
1224	Lelystad	Holland	50	B,G,H*,O*,P
1233	Liege	Belgium	5	B*,H*,O*,P*
1233	Tanger	Morocco	200	P*
1233	Virgin via ?	UK	?	G,K,N,O,P*
1242	Marseille	France	150	B*,G,H*,O,P
1242	Virgin via ?	UK	?	G,K,O*
1251	Marcali	Hungary	500	G*,H*,O*,P*
1251	Huisberg	Netherlands	10	O*
1251	R.Renascenca via ?	Portugal	10	O*
1260	Szczecin	Poland	160	P*
1260	SER via ?	Spain	?	H*,I*,O*,P*
1260	Guildford (V)	UK	0.5	O,P,Q
1269	Neumunster(DLF)	Germany	600	B,G,H*,I,K,O,P*,Q
1269	COPE via ?	Spain	?	O*,P*
1278	Strasbourg	France	300	H*,I,O,P
1278	Oublin/Cork(RTE2)	Ireland (S)	10	A*,G,I,K,O,P*
1287	RFE via ?	Czech Rep.	400	G,H*,I*,O,P*,Q
1287	Lerida(SER)	Spain	10	G,H*,O*,P*
1296	Torento	Italy	5	P
1296	Valencia(COPE)	Spain	10	B,G*,H*,I*,K*,O*,P*
1296	Orfordness(BBC)	UK	500	B*,G*,H*,N*,O
1305	Genova	Italy	5	P*
1305	Rzeszow	Poland	100	B*,H*,I*
1305	RNE5 via ?	Spain	?	G,H*,I*,P*
1314	R.Oue via ?	Italy	?	B*
1314	Kvitsoy	Norway	1200	A*,B,C,F*,G,H*,I,J*,K*,O,P*,Q,R
1323	W'brunn (V.Russia)	Germany	1000/150	B,G,H*,K,N*,O,P*,Q
1332	Rome	Italy	300	G,H*,I,K*,O*,P*
1341	Lakihegy	Hungary	300	H*,I*,O*,P*
1341	Lisnagarvey(BBC)	Ireland (N)	100	B,E,G,I,K,N,O,P*
1350	Nancy/Nice	France	100	B,G*,H*,I,K,O,P,Q
1350	Pecs	Hungary	10	O*
1350	Cesvaine/Kuldiga	Latvia	50	I*
1359	Arganda (RNE-FS)	Spain	600	B*,G,H*,K*,O*,P*
1368	Foxdale(Manx R)	I.O.M.	20	E*,H*,N,O,P*
1368	RAI via ?	Italy	?	P*
1377	Lille	France	300	B,G,H,I,K,O,P
1386	Athens	Greece	50	B*
1386	Bolshakovo	Russia	2500	B*,G,H*,I*,K,O*,P*,R*
1395	Lushnje(Tirana)	Albania	1000	B*
1395	TWR via Lushnje	Albania	500	G*,H*
1395	Lopic	Netherlands	120/40	B,G,H,I,O,P*
1404	Brest	France	20	B,G,H*,I,K,O,P,Q
1404	Sighet	Romania	50	B*
1413	RNE5 via ?	Spain	?	G,H*,I*,K*,O*,P*
1422	Alger	Algeria	50/25	H*
1422	Heusweiler(OLF)	Germany	1200/600	B*,C*,G,H*,I*,K,O,P*,Q,R
1422	Valmiera	Latvia	50	O*,P*
1431	Foggia	Italy	2	P*
1431	Kopani	Ukraine	500	G*
1440	Marnach(RTL)	Luxembourg	1200	A*,B,C*,E*,G,H*,I,K*,O*,P*,Q*,R,S*
1440	Moscow via ?	Russia	?	O*
1440	St.Petersburg(RFI)	Russia	10	P*
1440	Oamman	Saudi Arabia	1600	B*,H*,O*
1449	Squinzano	Italy	50	O*,P*
1449	Redmoss(BBC)	UK	2	B*,G,H*,N,O*
1458	Fllake	Albania	500	P
1467	Monte Carlo(TWR)	Monaco	1000/400	A*,B,G,H*,I*,O*,P*
1467	Bujanovac	Yugoslavia	1	B*
1476	Dubai	UAE	1500	B*,P*
1485	OCR via ?	Spain	2	P*
1485	SER via ?	Spain	?	G,K*,P*
1485	Carlisle(BBC)	UK	1	K*
1494	Clermont-Ferrand	France	20	B*,F*,G,H*,I*,O*,P,Q*
1494	St.Petersburg	Russia	1000	B*,E*,G*,H*,I*,K,O*,P*,O*,R
1503	Stargard	Poland	300	G
1503	RNE5 via ?	Spain	?	E*,K*,O*,P
1503	Beograd	Yugoslavia	10	B*
1512	Wolvertem	Belgium	600	A*,B,C*,E*,G,H,I,J*,K,O*,P*,R*
1512	Jeddah	Saudi Arabia	1000	O*
1521	Kosice(Cizatice)	Slovakia	600	I*
1521	Duba	Saudi Arabia	2000	B*,H*,P*
1521	R.Manresa(SER)	Spain	2	P*
1530	Vatican R	Italy	150/450	B*,D*,E*,G,H*,I,K,O*,P*,Q,R*
1530	Penheira(VOA)	Sao Tome	100	B*
1539	Mainflingen(ERF)	Germany	350(700)	B*,D*,I,H*,O*,P*
1539	SER via ?	Spain	?	G,O*
1557	Nice	France	300	B*,G,O,Q*
1566	Samen	Switzerland	300	B,E,G,I*,K*,Q,R*
1575	Genova	Italy	50	B,H*,I*,O*,P*,Q*
1575	SER via ?	Spain	5	G,I*,K*,O*,P*
1575	Villanueva(OCR)	Spain	5	O*
1584	SER via ?	Spain	2	K*,O*,P*
1593	Holzkirchen(VOA)	Germany	150	E*,G*,H*,I*,L*,O*,P*
1602	SER via ?	Spain	?	I*,O*,P*
1602	Vitoria(EI)	Spain	10	C*,G,I*,K*,O*,P*,O*
1611	Vatican R	Italy	15	G,P*,O*

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

Listeners:-
(A) Tim Allison, Middlesbrough.
(B) Paul Bowery, Burnham-on-Crouch.
(C) John Eaton, Woking.
(D) Ted Harris, Manchester.
(E) Sheila Hughes, Morden.
(F) Rhoderick Illman, Oxted.
(G) Ronald Jefferies, Berkeley.
(H) Eddie McKeown, Newry.
(I) George Millmore, Wootton IoW.
(J) Clare Pinder, while in Appleby.
(K) Peter Pollard, Rugby.
(L) Harry Richards, Barton-on-Humber.
(M) Chris Ridley, Co.Sligo, Eire.
(N) Tom Smyth, Co.Fermanagh
(O) Tony Stickells, Thornton Heath.
(P) Tony Stickells, while in Suevres, France.
(Q) Phil Townsend, E.London.
(R) Thomas Williams, Truro.
(S) Tom Winzor, Plymouth.

1630-1800 [Sat/Sun add 1600-1630]) 44434 at 1730 in Rugby; RNB Brazil 15.265 (Port, Eng, Ger to Eur 1630-2020) 43332 at 1758 in Plymouth; BBC via Woofferton? 15.485 (Eng to Eur, N.Africa? 0730?-2000?) SIO333 at 1800 in Macclesfield; Africa No.1, Gabon 15.475 (Fr to W.Africa 1600-1900) 25433 at 1807 in

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	A,E,F,G,J
585	R.Solway	B	2.00	B
603	Cheltenham R.	I	0.10	B,E,F
603	InvictaSG,Litt'brne	I	0.10	A,F,J,L
630	R.Bedfordshire(3CR)	B	0.20	A,C*,E,F,G,J,L
630	R.Cornwall	B	2.00	B,F,I
657	R.Clwyd	B	2.00	B,F,L
657	R.Cornwall	B	0.50	B,F
666	Gemini AM, Exeter	I	0.34	B,E,F
666	R.York	B	0.80	B,I
729	BBC Essex	B	0.20	A,C,D,F,G,J,L
738	Hereford/Worcester	B	0.037	C,E,F,G,J,L
756	R.Cumbria	B	1.00	B
756	R.Maldwyn, Powys	I	0.63	B,E,F,G
765	BBC Essex	B	0.50	A,B,C,D,F,G,J
774	R.Kent	B	0.70	A,F,G,J,K,L
774	R.Leeds	B	0.50	B
774	3 Counties SG, Glos	I	0.14	B,E,F,G
792	Chiltern SG,Bedford	I	0.27	A,E,F,G,J,L
792	R.Foyle	B	1.00	B,I
801	R.Devon & Dorset	B	2.00	B,E,F,G,J*
828	Chiltern SG, Luton	I	0.20	A,G,L
828	Magic 828, Leeds	I	0.12	B
828	2CR CG, Bournemouth	I	0.27	F,G
837	R.Cumbria/Furness	B	1.50	B
837	R.Leicester	B	0.45	A,B,C*,E,F,G,J
855	R.Devon & Dorset	B	1.00	F
855	R.Lancashire	B	1.50	B
855	R.Norfolk	B	1.50	A,J,L
855	Sunshine 855,Ludlow	I	0.15	A,C,E,G,J
873	R.Norfolk	B	0.30	A,C,F,G,J
936	Brunel CG, W.Wilts	I	0.18	B,E,F,J
945	S.Coast R, Bexhill	I	0.75	A,F,J,K*
945	Derby (Gem AM)	I	0.20	B,E,G
954	Gemini AM, Torquay	I	0.32	B,F
954	Wyvern AM, Hereford	I	0.16	E,F,G,H
963	Asian Sd,Manchester	I	?	B,G
963	963 Liberty (Viva)	I	1.00	A,B,E,F,G,J,K
990	R.Devon & Dorset	B	1.00	B,E,F,H
990	WABC, Wolverhampton	I	0.09	E,G
999	Gem AM, Nottingham	I	0.25	A,G,L
999	Red Rose G, Preston	I	0.80	B,H
999	R.Solent	B	1.00	A,E,F,J,L
1017	WABC, Shrewsbury	I	0.70	B,C*,E,G,H*
1026	R.Cambridgeshire	B	0.50	A,E,G,J,L
1026	Downtown, Belfast	I	1.70	B,E,H,I
1026	R.Jersey	B	1.00	F
1035	RTL Country 1035	I	1.00	A,B,E,F,G,H,I,J,K*
1035	N.Sound, Aberdeen	I	0.78	B,H
1116	R.Derby	B	1.20	A,B,F,G,H,J,L
1116	R.Guernsey	B	0.50	B,F,J
1116	Valleys R.	I	?	E,H
1152	Amber, Norwich	I	0.83	A,H
1152	Clyde 2, Glasgow	I	3.06	H
1152	LBC 1152	I	23.50	A,F,J,K*
1152	Pic'ly 1152,Manch'r	I	1.50	B
1152	PlymSnd AM,Plymouth	I	0.32	B
1152	Xtra-AM, Birmingham	I	3.00	E,G
1161	R.Bedfordshire(3CR)	B	0.10	A,G,J,L
1161	Brunel CG, Swindon	I	0.16	B,E,F
1161	Southern Counties R	B	1.00	A,F,J
1170	Amber SGR, Ipswich	I	0.28	A
1170	SCR, Portsmouth	I	0.50	B,F,J,K*
1170	Signal G,Stoke-on-T	I	0.20	G
1170	Swansea Snd,Swansea	I	0.58	A*
1170	1170AM,High Wycombe	I	0.25	A,J,L
1242	InvictaSG,Maidstone	I	0.32	A,D*,E,I,J,L
1242	IoW Radio, Wootton	I	0.50	F
1251	Amber SGR,Bury StEd	I	0.76	A,B,E,G,J,L
1260	Brunel CG, Bristol	I	1.60	E,F
1260	SabrasSnd,Leicester	I	0.29	G
1260	R.York	B	0.50	B
1278	Gt.Yks G, Bradford	I	0.43	G
1296	Radio XL,Birmingham	I	5.00	A,B,E,F,G,H*,I*,J
1305	Gt.Yks G, Barnsley	I	0.15	B
1305	Premier via ?	I	0.50	A,B,F,J
1305	Touch AM, Newport	I	0.20	E
1323	S.Coast R,Southwick	I	0.50	A,F,J
1323	SomersetSnd,Bristol	B	0.63	E
1332	Premier, Battersea	I	1.00	A,F,J
1332	CG 1332, Peterbor'	I	0.60	A,B,G
1332	Wiltshire Sound	B	0.30	E
1359	BreezeAM,Chelmsford	I	0.28	A,J
1359	CG 1359, Coventry	I	0.27	G
1359	R.Solent	B	0.85	F,H
1359	Touch AM, Cardiff	I	0.20	E
1368	R.Lincolnshire	B	2.00	A,G
1368	Southern Counties R	B	0.50	A,C*,F,J,L
1368	Wiltshire Sound	B	0.10	E,F
1377	Asian Sd,Manchester	I	?	G
1413	Premier via ?	I	0.50	A,B,I*,J
1431	Breeze AM, Southend	I	0.35	A,G,J,L
1431	CG 1431, Reading	I	0.14	C*,E,F,J
1449	R.Peterboro/Cambs	B	0.15	A,B,E,G
1458	R.Cumbria	B	0.50	B
1458	R.Devon & Dorset	B	2.00	B,F
1458	1458 Lite AM Manch'	I	5.00	H
1458	Sunrise, London	I	50.00	A,E,F,H,J,K*
1458	Radio WM	B	5.00	G
1476	CountySnd,Guildford	I	0.50	A,B,E,F,H,I*,J,K*
1485	R.Humberside (Hull)	B	1.00	A*,E,H
1485	R.Merseyside	B	1.20	B,I*
1485	Southern Counties R	B	1.00	A,D*,E,F,J,L
1503	R.Stoke-on-Trent	B	1.00	A*,B,C*,E,G,J,K*
1521	R.1521 Craigavon,NI	I	0.50	B,I
1521	Fame 1521, Reigate	I	0.64	A,E,F,G,J,K*,L
1530	R.Essex	B	0.15	A,C*,F,J,L
1530	Gt.Yks G.Huddersf'd	I	0.74	B,H*
1530	Wyvern, Worcester	I	0.52	B,E,F,G,H*
1548	R.Bristol	B	5.00	E,H*
1548	Capital G, London	I	97.50	A,F,G,H*,I*,J,K
1548	City G, Liverpool	I	4.40	B,H*
1548	Max AM, Edinburgh	I	2.20	A*,H*
1557	R.Lancashire	B	0.25	B
1557	Mellow, Clacton	I	0.8	A,E,H
1557	Northants CG	I	0.76	A*,G,H*
1557	S.Coast R, So'ton	I	0.50	A*,F,H*
1584	KCBC, Kettering	I	0.04	G
1584	London Turkish R	I	?	A,E,F,J
1584	R.Nottingham	B	1.00	C*,E,H*
1584	R.Shropshire	B	0.50	B
1584	Tay, Perth	I	0.21	H*
1602	R.Kent	B	0.25	A,B,F,J,L

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

Listeners:-

(A) Paul Bowery, Burnham-on-Crouch.
(B) Robert Connolly, Kilkeel.
(C) Sheila Hughes, Morden.
(D) Rhoderick Illman, Oxted.
(E) Ronald Jefferies, Berkeley.
(F) George Millmore, Wootton, IoW.
(G) Peter Pollard, Rugby.
(H) Chris Ridley, Co.Sligo, Eire.
(I) Tom Smyth, Co.Fermanagh.
(J) Tony Stickells, Thornton Heath.
(K) Tony Stickells, while in Suevres, France.
(L) Phil Townsend, E.London.

Storrington.

In the **13MHz (22m)** band R.Korea via Kimjae 13.670 (Eng to Eur 0800-0900) was 34443 at 0840 in Ross-on-Wye; SRI via Sottens? 13.685 (It, Eng, Fr, Ger, Port to Australasia 0830-1100) 45243 at 0900 in Newry; R.Australia via Darwin 13.605 (Eng, Chin to Asia 0900-1200) 33343 at 1021 in Middlesbrough; R.Austria Int via Moosbrunn 13.730 (Ger, Eng, Fr, Sp to Eur 0400-1800) 33333 at 1030 by **Thomas Williams** in Truro; UAER, Dubai 13.675 (Eng to Eur 1330-1355) 54544 at 1335 in Herstmonceux; UAER Abu Dhabi 13.665 (Eng to Eur 1300-1355) 54444 at 1349 in Plymouth; R.Nederlands via Flevo 13.700 (Eng to S.Asia, M.East 1330-1525) 32233 at 1352 by **Clare Pinder** in Appleby; R.Prague, Czech Rep 13.580 (Eng to Eur, E.Africa, N.America 1400-1427) 34433 at 1425 in Bridgwater; WHRI South Bend, USA 13.760 (Eng to E.USA, Eur 1500-2200) 34533 at 1523 in Woodhall Spa; R.Kuwait via Kabd 13.620 (Ar to Eur, N.America 0930-1605) SIO232 at 1531 in Woking; VOA via Selebi-Phikwe, Botswana 13.710 (Eng to Africa 1600-2230?) 43333 at 1740 in Stalbridge & 34232 at 2145 by **Ron Damp** in E.Worthing; SRI via Fr.Guiana 13.635 (Eng, Fr to Africa 2000-2100) 44444 at 2000 in Kilkeel; RCI via Sackville 13.650 (Fr, Eng to Eur, Africa 2000-2200) 24332 at 2010 in Oxted.

Good reception from some areas has been noted in the **11MHz (25m)** band. Logged during the daytime were R.Georgia via Dusheti 11.910 (Eng, Ger to Eur 0830-0900), rated SIO333 at 0843 by **Francis Hearne** in N.Bristol; Slovak R.Int via Velke Kostolany 11.990 (Eng to Australia 0830-0857) 44444 at 0847 in Plymouth; FEBC Bocaue, Philippines 11.635 (Eng to Asia 0930-1100) 24232 at 1058 in Bridgwater; R.Australia via Darwin 11.660 (Eng to SE.Asia 1130-1300) 44444 at 1205 in Norwich; R.Jordan via Al Karanah 11.690 (Eng to W.Eur, E.USA 1200-1700) 44333 at 1232 in Middlesbrough; Vatican R, Italy 11.625 (Eng to Asia, Pacific 1345-1400) SIO333 at 1345 in E.London; R.Finland via Pori 11.735 (Eng to N.America 1330-1400) 55555 at 1345 in Ross-on-Wye; RCI via Sines, Portugal 11.915 (Eng, Fr to Eur, M.East, Africa 1430-1600) 22222 at 1430 in Truro; RCI via Skelton, UK 11.935 (Eng, Fr to Eur, M.East, Africa 1430-1600) 43433 at 1430 in Herstmonceux; R.Nederlands via Madagascar 12.090 (Eng to S.Asia 1530-1625) 24222 at 1544 in Newry; RCI via Sackville 11.855 (Eng to N/C.America 1300-1500) 32233 at 1455 in Stalbridge; RFI via ? 11.700 (Eng to Eur, M.East, Africa 1600-1700) SIO555 at 1600 in Co.Fermanagh.

Later, R.Nederlands via Meyerton, S.Africa 11.655 (Eng to Africa 1730-2025) was 44444 at 1755 in Rugby; Monitor R.via WSHB 11.550 (Eng to Eur 1800-1958) 24222 at 1815 in Woodhall Spa; R.Kuwait via Kabd 11.990 (Eng to Eur, N.America 1800-2100) 33222 at 1925 in Morden; RCI via Sackville 11.945 (Fr, Eng to Eur, Africa 2000-2230) 34232 at 2010 in Oxted; AIR via Bangalore 11.620 (Eng, Hi to Eur 1745-2230) 44444 at 2108 in E.Worthing; VOA via Sao Tome 11.975 (Eng to Africa 1800-2230) 33222 at 2115 in Scalloway; RAE Argentina 11.710 (Sp 1900-2200) 35543 at 2152 in Wallsend; BBC via Ascension Is 11.835 (Eng to W.Africa 1930-2315) 34444 at 2215 in Chester; BBC via Ascension Is 11.750 (Eng to S.America 2000-0200) 33343 at 2347 in Woking; BBC via Kranji, Singapore 11.955 (Eng to S.Asia 0000-0300) 23322 at 0140 in Kilkeel; BBC via Cyprus 12.095 (Eng to M.East, E.Africa 0300-0500), noted as 'good' at 0400 by **Bill Griffith** (W.London) while in Doha, Qatar.

Some of the broadcasts in the **9MHz (31m)** band travel long distances to reach the UK. In the early morning R.New Zealand may be heard on 9.700. Their transmission to Pacific areas (Eng Mon-Fri 0816-1206, Sat/Sun 0758-1206) was rated 25222 at 0829 in Newry, 33333 at 0900 in Appleby, 33554 at 0955 in Plymouth and 32442 at 1200 in Bridgwater. R.Australia's broadcast to Pacific areas via Shepparton on 9.860 (Eng 0600-1200) was 34343 at 0830 in Woking.

During the afternoon R.Norway Int, Oslo 9.590 (Norw [Eng Sun] to Eur 1300-1330) was 33333 at 1300 in Truro; Voice of Vietnam, Hanoi 9.840 (Eng to Far East 1330-1400) 54433 at 1340 in Herstmonceux; China R.Int 9.535 (Eng to Asia, America 1400-1455) 22222 at 1425 in Stalbridge; R.Austria Int via Moosbrunn 9.655 (Ger, Eng 1500-1600) SIO333 at 1530 in Macclesfield; Vatican R, Italy 9.940 (Eng to Asia 1550-1620) 33333 at 1551 in Woodhall Spa; R.Australia via Darwin 9.615 (Eng to Asia, Pacific 1500-1755) SIO333 at 1700 in E.London; BBC via Kranji, Singapore 9.740 (Eng to S.E.Asia 0500-2200) 44333 at 1725 in Ross-on-Wye.

In the evening, Africa No.1, Gabon 9.580 (Fr to C.Africa 0500-2300) was 24232 at 1807 in Storrington; R.Nederlands via Madagascar 9.605 (Eng to S/E/W.Africa 1730-2025) 34333 at 1907 in Middlesbrough; WVHA via Scotts Corner, USA 9.930 (Eng to Eur, Africa 1900-2100?) 24333 at 1920 in Chester; Voice of Indonesia, Jakarta 9.525 (Eng to Eur 2000-2030) 34333 at 2021 in Oxted; VOA via Gloria, Portugal 9.760 (Eng to M.East 1700?-2200) 33323 at 2115 in Rugby; RCI via Sackville 9.805 (Fr, Eng to Eur, Africa 2000-2230) 23222 at 2128 in Thornton Heath; R.Nac del Paraguay 9.735 (Sp 0800-0400) 34443 at 2140 in Wallsend.

Later, R.Bulgaria, Sofia 9.700 (Eng to Eur? 2200-2230) was SIO444 at 2200 in Co.Fermanagh; VOFC Taiwan via WYFR USA 9.985 (Eng to Eur 2200-2300) 44444 at 2235 in Norwich; Voice of Greece, Athens 9.425 (Gr, Eng to Australia 2100-2250) 33222 at 2240 in Morden; Voice of Turkey, Ankara 9.560 (Eng to Asia, Pacific 2300-2358) SIO333 at 2337 in N.Bristol; HCJB Quito, Ecuador 9.745 (Eng to N.America 0030-0500) 33333 at 0120 in Kilkeel; BBC via Skelton, UK 9.410 (Eng to Eur, N/C.Africa 0300-2300), noted as 'good' at 0400 in Doha, Qatar.

Noted during the daytime in the **7MHz (41m)** band were R.Japan via Skelton, UK 7.230 (Eng to E.Eur 0700-0800) rated 44444 at 0700 in Appleby; WYFR via Okeechobee 7.355 (Eng to Eur, Africa 0600-0800) 32441 at 0730 in Chester; TWR Monte Carlo, Monaco 7.115 (Eng to Eur 0640-0820) SIO444 at 0800 in Co.Fermanagh; DW via Russia 7.390 (Chin to E.Asia) 23332 at 1030 in Oxted; R.Nederlands via Nauen 7.190 (Eng to Eur 1130-1325) 55354 at 1224 in Newry; DW via Wertachtal? 7.175 (Ger to Eur) 43444 at 1430 in Rugby; China R.Int 7.405 (Eng to W.USA 1400-1557) 43333 at 1450 in Norwich; R.Tirana, Albania 7.155 (Eng to Eur

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2004	G
2.325	ABC Tennant Creek	Australia	1920	D,G
2.485	ABC Katherine	Australia	1930	D,G
3.220	CPBS 1, Beijing	China	2111	L
3.220	Channel Africa	S.Africa	0300	K
3.220	R.Kara, Lome	Togo	2040	D
3.223	AIR Simla	India	1705	H,P
3.230	SABC Meyerton	S.Africa	0503	S
3.245	AIR Lucknow	India	1700	P
3.255	BBC via Maseru	Lesotho	2030	D,E,K,L,P,R
3.270	SWABC 1, Namibia	S.W.Africa	2038	D,L,P
3.290	Namibian BC,Windhoek	S.W.Africa	2038	D,K,L,P
3.300	R.Cultural	Guatemala	0630	K
3.306	ZBC Prog 2	Zimbabwe	2040	D,L,P
3.315	AIR Bhopal	India	0106	B,D,P
3.316	SLBS Goderich	Sierra Leone	2104	B,E,L,P
3.320	Pyongyang	N.Korea	1615	P
3.320	SABC Meyerton	S.Africa	2025	D
3.325	FRCN Lagos	Nigeria	2114	F,L,P
3.330	Christian Voice	Zambia	2125	P
3.335	CBS Taipei	Taiwan	2105	P
3.340	R.Uganda, Kampala	Uganda	2033	L,P
3.345	AIR Jaipur	India	0035	B,D
3.345	AIR Jammu	India	1645	P
3.356	R.Botswana	Gabarone	2050	D,K,L,P,R
3.365	GBC R-2	Ghana	2057	D,E,F,K,L,P
3.365	AIR Delhi	India	1625	C,P
3.375	R.Nacional S.Gabriel	Brazil	2225	P
3.380	R.Chortis	Guatemala	0100	D
3.395	ZBC Gweru	Zimbabwe	2245	D,P
3.900	Hulunbei'er, Hailar	China	1430	P
3.915	BBC via Kranji	Singapore	2059	G,K
3.925	NSB (R.Tampa)	Japan	0855	P
3.940	PBS Hubei Wuhan	China	2310	P
3.945	AIR Gorakhpur	India	1345	P
3.950	Qinghai PBS, Xining	China	2315	D,P
3.955	BBC via Skelton	England	2030	C,D,E,F,K,Q,S
3.960	Xinjiang PBS, Urumqi	China	0030	B,D,P
3.965	RFI Paris	France	1730	D,I,K,D,S
3.970	R.Korea via Skelton	England	1943	A,K,M
3.975	R.Budapest	Hungary	2040	A,D,F,I,K,M,S
3.985	Nexus, Milan	Italy	1645	J,O,S
3.985	China R via SRI	Switzerland	2100	A,D,I,K,Q
3.985	SRI Beromunster	Switzerland	2050	D
3.990	Xinjiang BS, Urumqi	China	1410	P
3.995	DW via Julich	Germany	2356	D,F,K,S
3.995	DW via Meyerton	S.Africa	2044	C,U
4.005	Vatican R.	Italu	2100	A,Q,R,S
4.035	Xizang PBS, Lhasa	Tibet	2320	K,P
4.330	Xinjiang BS, Urumqi	China	0040	D,P
4.460	CPBS 1, Beijing	China	1435	P
4.500	Xinjiang BS, Urumqi	China	0021	C,D,K,P
4.725	R.Myanmar, Yangon	Burma	1430	P
4.735	Xinjiang, Urumqi	China	0020	D,K,P
4.750	Xizang BS, Lhasa	China	0118	D,K,P
4.755	R.Educ CP Grande	Brazil	2335	D,P
4.760	Yunnan PBS,Kunming	China	2305	P
4.760	ELWA Monrovia	Liberia	0332	K
4.760	TWR Manzini	Swaziland	0300	K
4.765	R.Integracao	Brazil	0020	D,P
4.770	FRCN Kaduna	Nigeria	2027	B,C,D,E,G, K,L,P,R,S,T
4.775	AIR Imphal	India	1540	D,N,P
4.775	RRI Jakarta	Indonesia	2000	T
4.777	R.Gabon, Libreville	Gabon	2205	B,D,F,I,L,P,S,T
4.783	RTM Bamako	Mali	2011	B,E,F,L,P
4.785	R.Tanzania	Tanzania	2010	R
4.790	Azad Kashmir R.	Pakistan	1650	D,I,L,N,P
4.790	R.Atlantida	Peru	2255	P
4.800	CPBS 2 Beijing	China	0035	B,D,P
4.800	AIR Hyderabad	India	1649	L,P
4.800	LNBS Lesotho	Maseru	1956	D,K,L,R,T
4.805	R.Nac.Amazonas	Brazil	2206	B,D,L,P
4.815	R.Difusora, Londrina	Brazil	0035	D
4.815	R.diff TV Burkina	Duagadougou	2006	B,F,K,L,P,S,T
4.820	R.Botswana, Gaberone	Botswana	2131	B,S,T
4.820	AIR Calcutta	India	0040	D
4.820	Xizang, Lhasa	Tibet	2315	I,P
4.825	R.Cancao Nova	Brazil	0600	B
4.828	ZBC R-4	Zimbabwe	2005	F,K,L,T
4.830	R.Tachira	Venezuela	2316	D,F,P
4.832	R.Reloj	Costa Rica	0805	G,P
4.835	R.Tezulutlan, Coban	Guatemala	0035	D
4.835	RTM Bamako	Mali	2005	B,D,F,I,K,L,P,R,S
4.840	Heilongjiang, Harbin	China	1150	P
4.840	AIR Bombay	India	1647	D,K,L,P
4.845	DRTM Nouakchott	Mauritania	2004	D,F,L,P
4.850	R.Yaounde	Cameroon	2100	D,F,I,K,P,S
4.850	AIR Kohima	India	1347	D,P
4.860	AIR Delhi	India	0040	D,K
4.865	PBS Lanzhou	China	2156	B,D,I,L,P
4.865	L.V. del Cinaruco	Colombia	0045	D
4.870	R.Cotonou	Benin	2028	B,D,K,P
4.875	R.Roraima, Boa Vista	Brazil	0410	D,K,L
4.879	R.Bangladesh	Bangladesh	0045	D
4.880	AIR Lucknow	India	0045	D,P
4.885	R.Clube do Para	Brazil	2052	D,G,K,L,P
4.885	R.Difusora Acreana	Brazil	0025	D,K
4.885	KBC East Sce Nairobi	Kenya	2020	L,P
4.890	R.Port Moresby	New Guinea	2001	G,L,T
4.890	DRTS Dakar	Senegal	0345	K,P
4.895	R.IPB AM C'po Grande	Brazil	2100	L
4.895	Voz del Rio Arauca	Colombia	2330	D,P
4.895	AIR Kurseong	India	1455	D,P
4.895	Pakistan BC	Pakistan	1408	G,P
4.900	Haixia 2	China	1430	B,G,P
4.905	R.Nat.N'djamena	Chad	2030	B,D,F,K,L,P,S,T
4.910	R.Zambia, Lusaka	Zambia	2006	B,L,P,T
4.915	R.Anhanguera	Brazil	2114	D,G,L,P
4.915	GBC-1, Accra	Ghana	2121	D,I,K,L,P,T
4.920	R.Quito, Quito	Ecuador	0545	B,G,P
4.920	AIR Madras	India	0055	D
4.925	R.Mozambique,Maputo	Mozambique	2055	T
4.931	R.Internacional	Honduras	0120	K
4.935	KBC Gen Sce Nairobi	Kenya	2042	B,G,K,L,P,T
4.940	Haixia 1	China	2312	P
4.940	AIR Guwahati	India	1210	D,P
4.940	SLBC (Eng.Comm.Svce)	Sri Lanka	0050	D
4.950	R.Nacional, Mulvenos	Angola	2132	L,T
4.950	AIR Jammu	India	1510	H,L,P
4.950	VOA via Sao Tome	Sao Tome	2032	G,H,L,S
4.955	R.Nac. de Colombia	Colombia	2310	D,K,P
4.960	Hanoi 2	Vietnam	1205	P
4.970	PBS Xinjiang	China	1640	D,L,P
4.970	AIR Shillong	India	0055	D
4.975	Fujian 1, Fuzhou	China	1420	P
4.980	PBS Xinjiang, Urumqi	China	0100	D,P
4.980	Ecos del Torbes	Venezuela	2115	D,E,F,G,K,L,P
4.985	R.Brazil Central	Brazil	2320	D,K,L,P
4.990	AIR Ext.Service	India	0004	K,P
4.990	FRCN Lagos	Nigeria	2029	D,P,R
5.005	R.Nacional, Bata	Eq.Guinea	1906	K,L,P
5.005	R.Nepal, Kathmandu	Nepal	1415	H,L,P
5.009	R.TV Malagasy	Madagascar	1755	H,L
5.010	Guangxi 2, Nanning	China	2320	P
5.010	AIR Thiru'puram	India	0110	D,K
5.020	PBS-Jiangxi Nanchang	China	2305	B,D,P
5.020	La V du Sahel,Niamey	Niger	2100	B,D,F,K,L,P,R,T
5.025	ABC Katherine	Australia	2138	L
5.025	R.Parakou	Benin	2117	D,K,L,P
5.025	R.Pakistan, Quetta	Pakistan	1300	H
5.025	R.Uganda, Kampala	Uganda	2059	K,L
5.030	AWR Latin America	Costa Rica	1005	D,P
5.035	R.Aparecida	Brazil	0510	P
5.035	R.Bangui	C.Africa	2117	L
5.040	PBS Fujian, Fuzhou	China	2300	P
5.045	R.Cultura do Para	Brazil	0110	D
5.047	R.Togo, Lome	Togo	2116	D,F,K,L,P,R
5.050	Guangxi FBS, Nanning	China	2322	L,P
5.050	AIR Aizawl	India	0115	D
5.050	R.Tanzania	Tanzania	1903	B,K,L
5.055	RFD Cayenne(Matoury)	French Guiana	2115	D,L,P
5.060	PBS Xinjiang, Urumqi	China	0009	D,F,I,P
5.075	Caracol Bogata	Colombia	0105	D,K,P
5.090	Taiwan 2 Sce,Beijing	China	1410	P
5.125	Taiwan 1 Sce,Beijing	China	1420	L,P
5.163	CPBS 2, Beijing	China	1415	P

DXers:-

(A) Tim Allison, Middlesbrough.
(B) Paul Bowery, Burnham-on-Crouch.
(C) Vera Brindley, Woodhall Spa.
(D) Robert Connolly, Kilkeel.
(E) Ron Damp, Worthing.
(F) John Eaton, Woking.
(G) David Edwardson, Wallsend.
(H) Bill Griffith, while in Doha, Qatar.
(I) Sheila Hughes, Morden.
(J) Rhoderick Illman, Oxted.
(K) Eddie McKeown, Newry.
(L) Fred Pallant, Storrington.
(M) Clare Pinder, while in Appleby.
(N) Peter Pollard, Rugby.
(D) Alan Roberts, Quebec, Canada.
(P) John Slater, Scalloway.
(Q) Tom Smyth, Co.Fermanagh.
(R) Tony Stickells, Thornton Heath.
(S) Phil Townsend, E.London.
(T) Mahendra Vaghjee, Rose Hill, Mauritius.
(U) Thomas Williams, Truro.

1715-1730) SIO344 at 1715 in E.London.

In the evening, R.Thailand via Udon Thani 7.295 (Eng to Eur 1900-2000) was 33222 at 1920 in Morden; Israel R, Jerusalem 7.465 (Eng to Eur, N.America 2000-2030) 33333 at 2005 in Truro; DW via Sines 7.285 (Eng to Eur 2000-2050) 45343 at 2016 in Storrington; R.Bulgaria via Plovdiv 7.335 (Eng to Eur 2000-2100) 44434 at 2032 in Woodhall Spa; VOA via Selebi-Phikwe, Botswana 7.415 (Eng to Africa 1900-2230) 32222 at 2114 in E.Worthing; AIR via Aligarh? 7.410 (Hi, Eng to Eur 1745-2230) 43333 at 2124 in Plymouth.

Later, the Voice of Russia 7.125 (Eng [WS]) was SIO444 at 2329 in N.Bristol; Monitor R.Int, via WSHB 7.510 (Eng to S.Europe, W.Africa 2300-2355) 34323 at 2344 in Middlesbrough; RFPI Costa Rica 7.385 (Eng 24hrs) 33443 at 0001 in Bridgwater; WRNO New Orleans, USA 7.355 (Eng to E.USA 2330?-0300) 34323 at 0012 in Woking; Monitor R.Int via WSHB 7.535 (Eng to E.N.America 0000-0100) 44444 at 0054 in Ross-on-Wye.

Many of the broadcasts in the **6MHz (49m)** band are intended for listeners in Europe. Among those noted were AWR via Slovakia 5.905 (Eng 0500-?), rated 44444 at 0530 in Newry; HCJB Quito 5.860 (Eng 0700-0900) 44444 at 0700 in Norwich; WEWN Vandiver 5.825 (Eng 2100-1000) 43444 at 0840 in Oxted; R.Vlaanderen Int, Belgium 6.035 (Eng 1000-1030 Mon-Sat) 54554 at 1015 in Bridgwater; R.Austria Int, via Moosbrunn 6.155 (Ger, Eng, Fr, Sp 0400-2300) 54444 at 1541 in Plymouth; R.Prague via Litomysl 5.835 (Eng 1800-1827) 54444 at 1800 in Morden; China R.Int 6.950 (Eng 2000-2157) SIO222 at 2000 in E.London; R.Pyongyang, Korea 6.576 (Eng, Fr 2000-2150, also to M.East, Africa) 34333 at 2028 in Woodhall Spa; Vatican R, Italy 5.882 (It, Esp, Fr, Eng, Sp, Port 2000-2158) 55445 at 2040 in Thornton Heath; R.Austria Int 5.945 (Eng, Ger, Fr, Sp 1800-2300) 43333 at 2118 in E.Worthing; Monitor R.Int, via WSHB 5.835 (Eng 2000?-2200, also to USA) 33323 at 2120 in Rugby; R.Korea via ? 6.480 (Eng 2100-2200) 43433 at 2159 in Herstmonceux; VOFC Taiwan via WYFR? 5.810 (Eng 2200-2300) SIO444 at 2200 in Co.Fermanagh; R.Japan via Skelton, UK 6.180 (Eng, Jap 2300-0100) 32333 at 2300 in Appleby; WHRI South Bend, USA 5.745 (Eng 2200-0400) 34433 at 2315 in Chester.

Some to other areas were also logged: RCI via Sackville 5.960 (Eng, Fr to USA, Caribbean 2300-0100) was 32332 at 2339 in Woking; R.Nederlands via Ned.Antilles 6.165 (Eng to N.America 2330-0125) 33333 at 0032 in Middlesbrough; SRI via Schwarzenburg? 6.135 (Ger, Eng, Sp, Fr, It to N/C.America 0030-0315) 44544 at 0110 in Ross-on-Wye; R.Havana Cuba 6.000 (Eng to N.America 0100-0400) 32332 at 0110 in Kilkeel; BBC via Ascension Is 6.005 (Eng to W.Africa 0300-0730) noted as 'good' at 0400 in Doha, Qatar; BBC via Antigua 6.195 (Eng to C/S.America 1000-1400) 43333 at 1000 in Stalbridge.

Transatlantic DX Chart

Freq (kHz)	Station	Location	Time (UTC)	DXer
		USA		
660	WFAN	New York, NY	0002	B,C,D
670	WMAQ	Chicago, IL	0802	B
680	WRKD	Boston, MA	0844	B
710	WOR	New York, NY	0004	B
770	WABC	New York, NY	0055	B,C,D
780	WBBN	Chicaago, IL	0837	B
820	WBAP	Fort Worth, TX	0759	B
840	WHAS	Louisville, KY	0128	B,C
850	WEEI	Boston, MA	2327	B,C,D,G
870	WWL	New Drleans, LA	0500	B,D
880	WCBS	New York, NY	0600	B,C,D
1010	WINS	New York, NY	0145	A,B,C,D,G
1020	KDKA	Pittsburg, PA	0743	B
1030	WBZ	Boston, MA	0110	C,D
1050	WEVD	New York, NY	2234	D
1120	KMOX	St.Louis, MO	0815	B
1130	KFAN	Minneapolis, MN	0905	B
1130	WBBR	New York	0015	B,C,D,E,F,G
1170	WWVA	Wheeling, VA	2353	B
1180	WHAM	Rochester, NY	1000	B
1190	WDWD	Ft.Waine, IN	0800	B
1380	WFCL	Clintonville, WI	0037	B
1390	WXTC	Charleston, SC	0300	B
1410	WPOP	Hartford, CDN	0020	B
1430	WENE	Endicott, NY	0906	B
1440	WLPZ	Portland, MA	0001	B
1450	WFPG	Atlantic City, NJ	0007	B
1500	WTDP	Washington, D.C.	0155	A,C,D,E,F,G
1510	WNRB	Boston, MA	0030	C,D,E,G
1520	WWKB	Buffalo, NY	0021	B
1560	WQEW	New York	0207	B,C,D
1590	WAKR	Akron, DH	0510	B
1590	WARV	Warwick, RI	0000	B
1590	WSMN	Nashau, NH	2348	B
1600	WWRL	New York, NY	0210	A
1660	WJDM	Elizabeth, NJ	0009	B
		CANADA		
560	CHVD	Carbonear, NF	0215	B,C
580	CJFX	Antigonish, NS	0001	B,C,D
590	VOCM	St.John's, NF	0135	B,C,D
620	CKCM	Grand Falls, NF	0115	C
640	CBN	St.John's, NF	0800	B
650	CKGA	Gander,NF	0148	B,C,D
680	CJDB	Winnipeg, MB	0900	B
680	CKXG	Grand Falls, NF	0823	B
700	CHSJ	St.John, NB	0817	B
710	CKVO	Clarenville, NF	0135	A
740	CHCM	Marystown, NF	0027	B,C
750	CBGY	Bonavista Bay, NF	1100	C
780	CFDR	Dartmouth, NS	0220	B,C
820	CHAM	Hamilton, DN	0827	B
850	CKVL	Montreal, PQ	2146	D
920	CJCH	Halifax, NS	0012	B,C,D
930	CJYQ	St.John's, NF	2323	B,C,D,G
940	CBM	Montreal, PQ	2346	B,C,D
950	CHER	Sydney, NS	0045	C
950	CKNB	Cambellton, NB	2359	B,D
980	CBV	Quebec, PQ	0754	D
1010	CFRB	Toronto, DN	2338	C,D
1070	CBA	Moncton, NB	0000	B
1140	CBI	Sydney, NS	1007	B
1290	CHRM	Matane, PQ	0032	B
1380	CFDA	Victoriaville, PQ	0035	B
1400	CBG	Gander,NF	0000	B

DXers:-

(A) Robert Connolly, Kilkeel.
(B) Paul Crankshaw, Troon.
(C) Eric Duncan, St.Andrews.
(D) David Edwardson, Wallsend.
(E) Harry Richards, Barton upon Humber.
(F) John Slater, Scalloway.
(G) Tony Stickells, Thornton Heath.

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AKD2001 2m transceiver with Jaybeam base antenna, £120. AKD h.f. wavemeter, £38, plus carr. John, QTHR. Tel: 0191-416 2606 or (0378) 386843.

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AOR AR2700 hand-held scanner, mint, boxed with carrying case and Watson regular gainer flexible antenna, £150 o.n.o. 1940s Ericsson headset and two No. 2 MkIII military Morse keys, offers please. Tel: Inverurie (01467) 625038 evenings.

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MLB r.f. systems magnetic longwire balun, new, in sealed package, £30 posted or exchange PC-Pakratt or Scancat software. Tel: Cornwall (01288) 361739.

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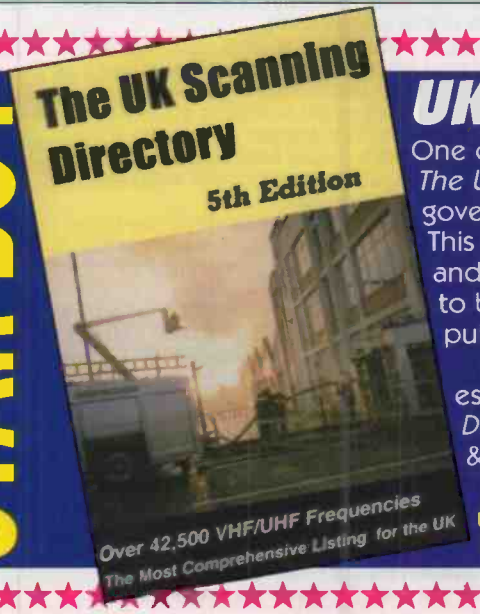

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Just a very quick word this month, I hope you have all survived that awful winter! As you can see, I have been busy stocking up with some new titles. So, now's the time to keep those frequency directories up-to-date.

Bye for now 73 Michael

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OR PLEASE USE THE ORDER FORM ON PAGE 87.

This month we have focussed on books catering for those interested in Maritime Radio. This is a very popular subject with readers of *Short Wave Magazine* and these books have been selected to provide something of interest to listeners and sailors alike.

Profiles

1

Ship To Shore Radio Frequencies

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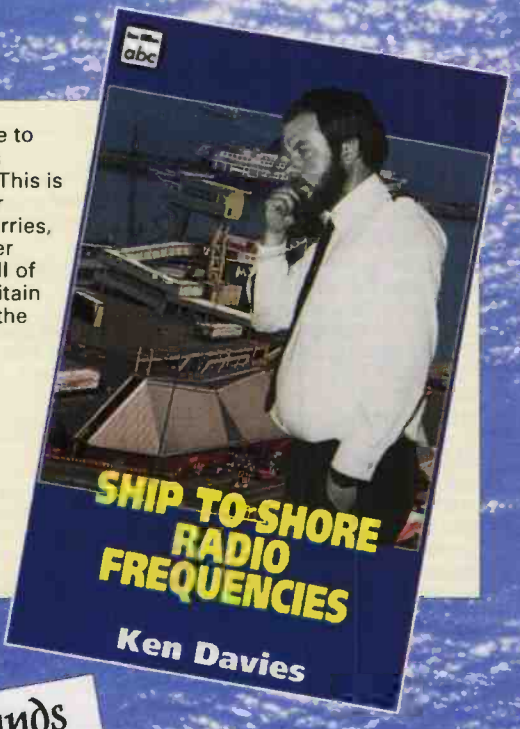
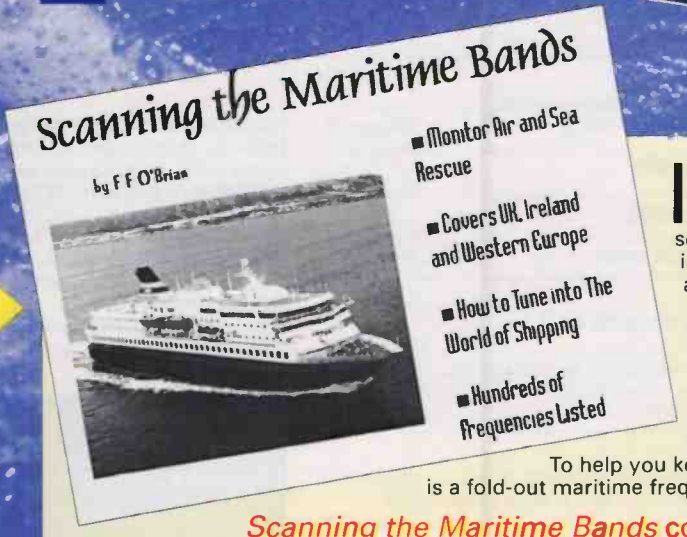
This book provides all those interested in matters marine a detailed handbook listing all the radio frequencies likely to be encountered around our shores.

Ship To Shore Radio Frequencies costs **£5.99**.



2

Scanning the Maritime Bands



It's easy to listen in on v.h.f. maritime radio communications with a scanner - transmissions are in the clear and there are about ten times as many ships as aircraft. *Scanning the Maritime Bands* gives you the Channel number for each port, harbour and coast radio station in the UK, Ireland, western Europe and up to Iceland. To help you key in the frequencies there is a fold-out maritime frequency list.

Scanning the Maritime Bands costs **£9.50**.

Scanning The Maritime Bands

To order any of the titles mentioned on these two pages please use the Or

Profiles

3

Marine SSB Operation

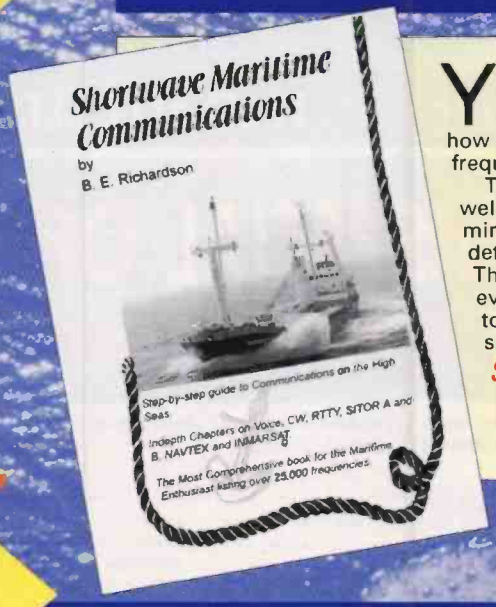
The range of Marine SSB radio is potentially world-wide, allowing sailors to maintain contact from anywhere on the world's oceans. If you intend to sail blue water, you need Marine SSB and if you need Marine SSB, you need this book.

In *Marine SSB Operation*, Michael Gale uses his 12 year's experience teaching thousands of sailors to qualify for their VHF and SSB Certificates to explain how single sideband marine radio systems work. This book covers everything you need to know to gain the international 'Restricted' Certificate. It also explains how to choose and install your set and get the best out of it. there is also a chapter on Amateur Radio with the emphasis on the Maritime Mobile Nets.

Marine SSB Operation costs **£11.95**.

4

Shortwave Maritime Communications



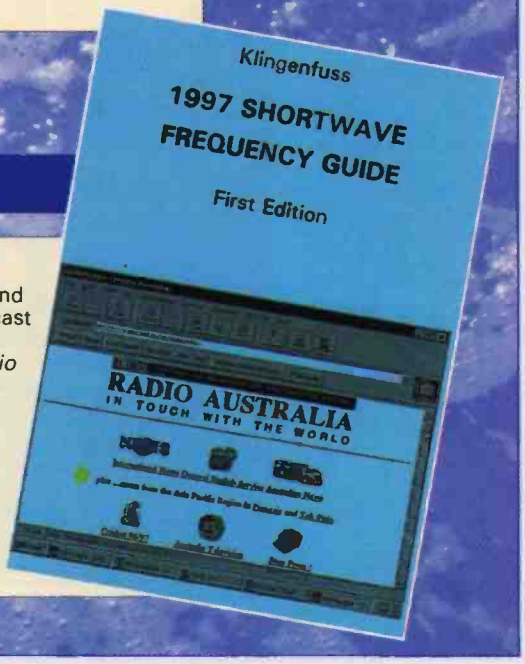
You can be in the thick of the action with *Shortwave Maritime Communications*. This book gives you step-by-step instructions on how to monitor all the short wave shipping frequencies around the world.

The book is laid out with both beginner and well-seasoned maritime radio enthusiast in mind, providing the most accurate and detailed information in an easy-to-use format. There are two mammoth frequency lists with every coastal station around the world listed together with the shore and corresponding ship's frequency.

Shortwave Maritime Communications costs **£16.50**.

5

1997 Shortwave Frequency Guide



Klingenfuss has long been regarded for his range of comprehensive frequency guides. Now he has produced the first edition of a new and really up-to-date *Shortwave Frequency Guide* covering both broadcast and utility radio stations.

This new book is a by-product of the Klingenfuss *Guide to Utility Radio Stations* and the *Super Frequency List On CD-ROM*. It is claimed that, by using the latest technology, the *Shortwave Frequency Guide* is as up-to-date as possible.

The book is divided into two sections, one dealing with short wave utility stations, the other with short wave broadcast stations.

The *Shortwave Frequency Guide First Edition* costs **£21.00**.

der Form in this issue or telephone Michael or Shelagh on (01202) 659930.

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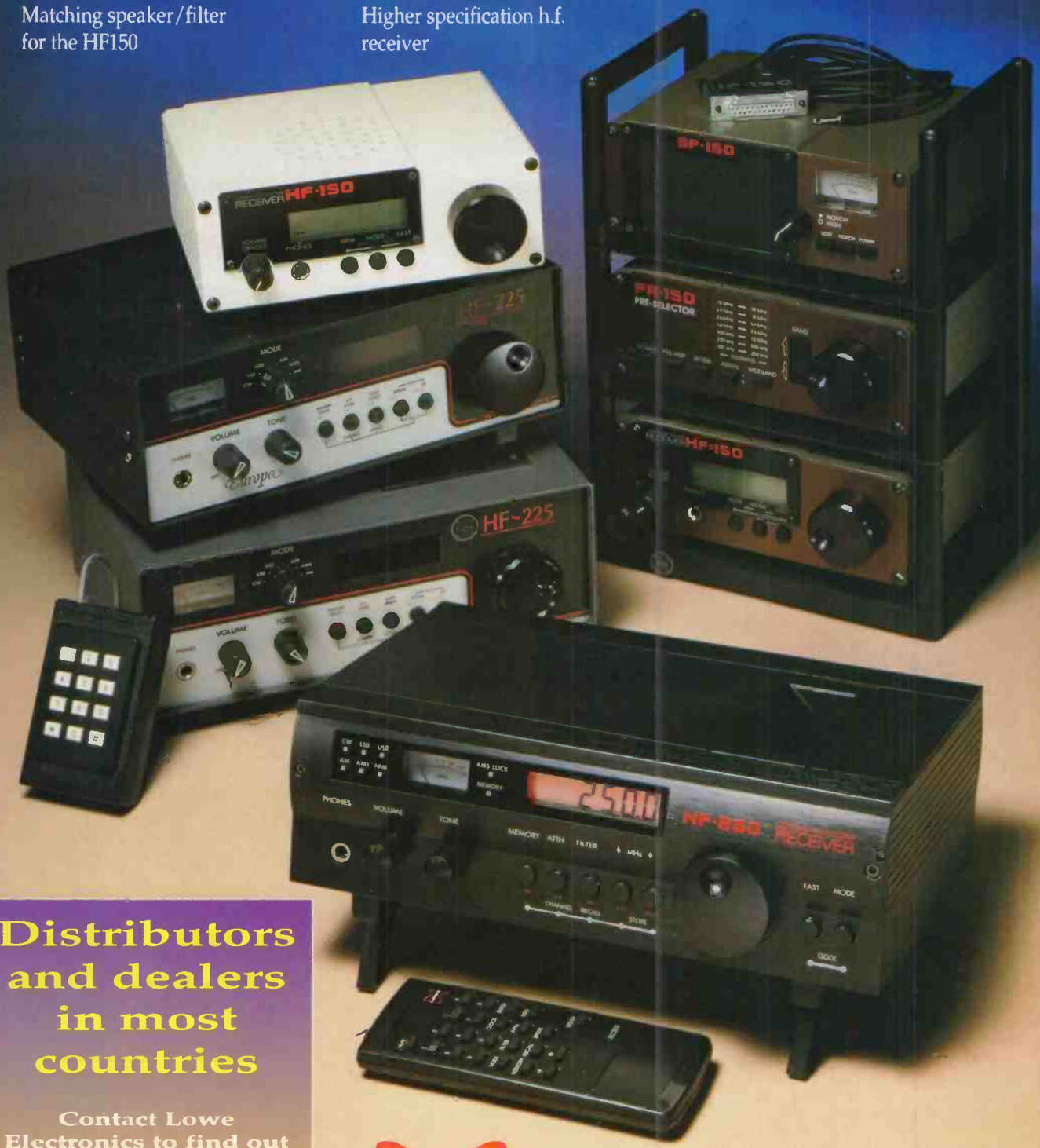

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