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# RADIO ROVERS

The First Medium Wave  
Football Club Radio  
Station

# short wave magazine

September 1996 £2.50 ISSN 0037 - 4261

What Is Utility Listening?

When I Win The Lottery -  
Mike Richards' Dream

GMDSS Explained

A Post War Radio  
System - Piccolo

John Wilson  
Reviews  
Icom's New  
IC-R8500  
Receiver

**WIN**  
WELZ WS1000E  
PART 3



AIRBAND -- SATELLITES -- BROADCAST -- DXTV -- SCANNERS

# High quality SCANNERS

at prices you can afford

## UBC220XLT

The UBC 220 XLT is an easy to use scanner with 200 memory channels. Includes 10 band coverage, automatic search, priority channel and selective scan delay. Display light, automatic lockout and direct channel access. Also includes Belt clip, earphone case and flexible antenna accessories.

Frequency coverage: 66 - 88, 108 - 174, 406 - 512, 806 - 956 MHz. Scan speed 100 channels per second scanning and 25 frequencies per second in search mode.

PRICE **£189.95**



## UBC120XLT Handheld

A new compact designed handheld featuring Twin Turbo Scan & Search, and a pre-programmed SVC (service) search facility which allows you to toggle the aircraft, marine and other service bands in search mode.

For maximum convenience in monitoring, the 120XLT has 100 memories arranged in 10 banks plus 10 priority channels enabling you to keep track of your favourite frequencies. Channel lock-out and unique data skip facility are also included. Full frequency LCD display with direct frequency entry keyboard. Complete with NiCad battery and charger, belt clip, earpiece and rubber duck antenna.

Frequency coverage: 66-88, 108-174, 406-512MHz

PRICE **£139.00**



## UBC3000XLT

A superior 400 channel handheld from the Uniden stable, offering a near continuous coverage from 25-550MHz and 760-1300MHz. Reception modes include AM, FM and Wide FM, user selectable (FM & WFM only on the upper bands). Automatic search, priority channel and selective scan delay. Turbo scan/search facility offers 300 channels per second in search mode and 100 channels per second in normal mode. With a switchable delay of approximately 2 seconds. Backlight LCD display and fully functional keypad for direct frequency entry.

Accessories included:

- belt-clip ■ earphone ■ case
- flexible antenna together with 240V AC adapter/charger.

PRICE **£249.95**



# uniden

## UBC65XLT

The new UBC 65 XLT offers outstanding value for money with 10 memory channels and wide frequency coverage. It will prove especially popular for Amateur radio, Ship to Shore, Land Mobile and Public Service coverage. Features 10 channels, 8 band coverage, 2 digit LCD display, memory backup, keyboard lock switch and channel lockout and battery low indicator. Accessories included are charger and earphone. Frequency coverage: 66 - 88, 137 - 174, 406 - 512 MHz. Scan speed: 10 channels per second. Required: 5 x AA Nicads or 12 VDC adaptor

PRICE ~~£95.95~~  
NEW LOW PRICE **£89!!**



## UBC860XLT

A stylish designer base station scanner which offers 100 memory channels and a 12 band coverage including 800MHz.

Features Uniden's patented TWIN TURBO scan and search facility. The BC860XLT represents the best value for money in the home base scanner market - covering all of the most popular bands including the Amateur VHF and UHF bands, Civilian Airband, Marine & PMR, plus the high UHF 800MHz band.

Features include manual keyboard entry with auto track tuning and a unique data skip option for bypassing unwanted data transmissions. It also helps to reduce birdies!

- Full frequency LCD display ■ Programmable delay ■ 10 priority channels ■ Automatic squelch ■ 3-day memory back-up ■ Channel lock-out and priority ■ Frequency coverage 66-88, 108-174, 406-512, 806-956MHz ■ Scan/Search speed: Max 100 ch/steps per sec (300 ch with Turbo on)

Power requirements: 12V DC via supplied 240V AC mains adapter

PRICE **£139.00**

## UBC9000XLT

A new 500 channel base station model covering 25MHz to 1.3GHz in two continuous bands (25-550MHz and 760-1300MHz). Featuring Twin Turbo scan & search modes with 10 user definable priority channels. Easy to read large LCD display and manual tuner together with direct frequency keypad make up a very professional front panel. User selectable modes covering AM, FM and Wide FM modes. Selectable receiver attenuator, delay and data options are available direct from the keyboard. For unattended operation the 9000XLT has an automatic tape recorder ON/OFF and tape output feature! Accessories included: AC mains power adapter, telescopic antenna and owners manual.

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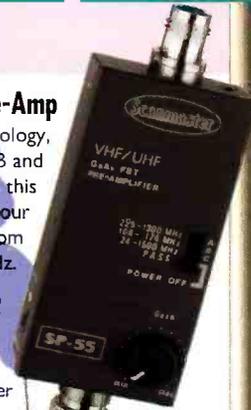


**SCANMASTER Base Stand**  
A fully adjustable desk top stand for use with all handhelds. Fitted coaxial fly lead with BNC and SO239 connectors.  
**£19.95**



**SCANMASTER Mobile Mount**  
Mounts on the air vent grills on a car dashboard to allow easy and safe operation of most hand-helds.  
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**SCANMASTER SP55 Pre-Amp**  
Using latest surface mount technology, with variable gain - 6dB to + 20 dB and three selectable bandpass filters this top range Pre-Amps will boost your scanners performance from 24 - 1500 MHz.  
**£69.95**



**SCANMASTER On Glass**  
Window mounting mobile scanner antenna 25 - 1300 MHz with cable.  
**£29.95**

**SCANMASTER GW2 Pre-Amp**  
Wideband variable gain low noise G and A's FET pre-amp to boost reception on your scanner.  
**£59.95**



**SCANMASTER Drill-Thru Mount Mobile Antenna**

A low profile discreet scanner antenna optimised for the UHF bands c/w 10' cable. Receives 25 - 1000 MHz

**£19.95**

**SCANMASTER TSC 2601**

Handheld scanner high gain antenna, 29cm long, covers 100 - 1000 MHz with 3.4 dB gain @ 900 MHz.

**£15.95**



**SCANMASTER Mobile**

A top quality Wideband Antenna 25 - 1000 MHz with rubber boot protected magnetic mount and cable/BNC connection.

**£29.95**

**SCANMASTER Desktop**

A complete desktop antenna covering 25 - 1300 MHz just 36" high with 4 mtrs of cable and BNC plug.

**£49.95**



# SCANMASTER by NEVADA

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- CIVIL AIRCRAFT
- MILITARY AIRCRAFT
- AMATEUR RADIO
- PMR
- 900 MHz BAND
- PLUS MANY MORE PUBLIC SERVICES

Transmits 2m & 70cm Amateur Bands

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**SCANMASTER Discone**

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**NEW! SCANMASTER Active Discone**

As left with 20 dB Pre-Amp available august

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A High performance wideband antenna, offering gain over a conventional discone. Stainless steel construction with standard PL259 connector, mounting pole plus brackets.

Superior performance on Air, Marine and PMR bands.  
\* 25-1300MHX  
\* Ultra wideband TX Capability

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**NEW! SCANMASTER Active Base Antenna**

As above with 20 dB Pre-Amp available august

**£59.95**

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  - NMEA-0183 GPS Interface provides tagging data with location for mapping applications\*
  - CI-V compliant Serial Data Interface with both TTL and RS232C levels
  - Frequency Recording Memory Register logs 500 frequencies with Time, Date, Latitude, and Longitude information
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  - Frequency Lock Out, Manual Skip, and Auto or Manual Hold capability
  - Tape Control Output with Tape Recorder Pause control relay and DTMF Encoder for audio data recording
  - Rotary Encoder for easy selection of menus for setup
  - Internal Speaker, Audio earphone/headphone jack
  - Miniature 8-pin DIN Serial Interface port for PC connection
  - Relative ten segment Signal Strength Bargraph Mode
  - Numerical Deviation Mode with 1-10kHz and 10-100kHz ranges
  - Includes Built-in Rapid Charge NiCad Batteries with 8 hour discharge time and a Universal Power Supply
- \*Software for mapping applications is planned by third party Software Design Companies. Inquire about the availability and specific Companies to contact.



The Xplorer offers All Mode Communications Decoding.

461.725 MHz  
CTCSS: 103.5 Hz

CTCSS Mode

461.725 MHz  
DCS: 047

DCS Mode

461.725 MHz  
DTMF: 8003275912

DTMF Mode

### Additional Display Modes:

- Latitude/Longitude Mode
- Signal Strength Mode
- Deviation Mode
- LTR-Trunking Mode



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22 Main Road • Hockley • Essex • SS5 4QS  
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ON SALE AUGUST 22

Next issue on sale SEPTEMBER 26

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 for it. Prices are those current as we go to press. *Short Wave*  
*Magazine*, USPS No. 006996, is published monthly for £25 (UK) per  
 year by PW Publishing Ltd., Arrowsmith Court, Station Approach,  
 Broadstone, Dorset BH18 8PW. Second Class Postage paid at  
 South Hackensack. Postmaster: Send USA address changes to  
 Royal Mail International, c/o Yellowstone International, 2375 Pratt  
 Boulevard, Elk Grove Village, IL 60007-5937.

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 Rovers and Alan  
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Photograph Action Images.

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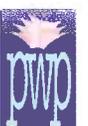


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Good Listening

**DISCLAIMER.** Short Wave Magazine wishes in no way to either condone, or encourage, listeners to monitor frequencies and services which are prohibited by law. We respectfully refer you all to both the Wireless Telegraphy Act 1949, and the Interception of Communications Act 1985. Some of the products offered for sale in advertisements in this magazine may have been obtained from abroad or from unauthorised sources. *Short Wave Magazine* advises readers contemplating mail order to enquire whether the products are suitable for use in the UK and have full after-sales back-up available. The Publishers of *Short Wave Magazine* wish to point out that it is the responsibility of readers to ascertain the legality or otherwise of items offered for sale by advertisers in this magazine.



# Communique

SEND YOUR  
NEWS TO KEVIN  
NICE AT THE  
EDITORIAL  
OFFICES

## RADIO AND TVDX NEWS

'Channel Travel Radio' is a motorist orientated radio service providing traffic and travel information for folk approaching from the M20 and entering the Channel Tunnel in Kent. NTL were contracted to provide the total installation, the main transmitter at Folkestone and other relays along the M20 from Ashford. The whole system operates at 107.60MHz and there is provision for additional relay transmitters.

The Swiss PTT have commissioned their first DAB (digital audio broadcasting) experiments across the Bernese Oberland region, operated by the Swiss SSR network and other local broadcasters.

Both the BBC Crystal Palace, London and Pontop Pike, Newcastle transmitters have been radiating digital TV multiplex tests (both BBC-1 and BBC-2) together with other data information and a BT interactive data project. Only specialised digital ready receivers can be used to decode the transmissions, the BBC have been provided with prototype tuner units produced by Pace Electronics for these tests.

In Iran a fourth TV channel (IRIB-TV4) opened late Spring, offering a diet of instructional and cultural programming. Though initially confined to the major population centres (Tehran) it is hoped that the TV4 network will expand across Iran over the next few years.

Private funding will allow the UN to open a TV network in the larger towns of Bosnia before mid September. Already \$10 million has been promised which will allow medium and low power transmitters to open in the state together with a production and satellite terminal centre at Sarajevo. Several local TV channels have agreed to cooperate in the project - RTV Mostar; Studio 99, Sarajevo; TV Tuzla; TV Hayat; and Zeatel in Zenica. Programming will be free to air.

## SHENZI SP03

A new combiner/splitter has recently been launched by Shenzi, the Simba SP03.

The unit allows up to two antennas to be connected to up to two receivers. The SP03 has two antenna inputs one for antennas with a frequency range of 100kHz to 40MHz the other 100kHz to 1GHz. The receiver outputs are likewise specified, i.e. one 100kHz to 40MHz the other 100kHz to 1GHz.



The unit is housed in a diecast aluminium box. All connectors are SO-239 type u.h.f. sockets, impedance of all inputs and outputs is 50Ω. The SP03 costs £27.95 plus £1.50 P&P. For more information contact: **Shenzi, PO Box 35, Richmond, N.Yorks DL11 7YX.**

## HOWES DC2000 RECEIVER KIT

The new Howes DC2000 Receiver Kit has been designed to meet the needs of the novice constructor and those seeking an effective, but low cost receiver for portable and holiday use. The high sensitivity (typically -118dBm, 0.3µV for 10dB signal to noise ratio in an s.s.b. bandwidth), and low quiescent current consumption (about 22mA at 13V) ensure that good performance can be obtained from a simple battery supply and small antennas. A d.c. supply of between 10 and 15V is required.

The receiver is a direct conversion type with integrated circuits for the double balanced mixer, audio preamplifier and loudspeaker driver stages. Band changing is by means of plug-in



band modules. One module is provided with the kit (80m as standard, or to customers choice). Optional modules are available to cover all the h.f. amateur bands, 160 to 10m. Modules for other h.f. frequencies can also be used.

The DC2000 kit contains the printed circuit board and all board mounted components to build the receiver mother board, plus the circuit board and components for one band module. Full, clear instructions and technical support to the usual Howes standard are included.

An optional hardware pack, HA22R, is available to case the project. The DC2000 is interlinkable with other kits in the Howes range, including digital frequency display, transmitters, narrow audio filter, 'S-meter', etc.

The DC2000 kit costs £22.90 and the HA22R hardware, £18.90. Optional band module kits are £7.90 each. P&P is £1.50 for kits, or £4.00 if hardware is ordered. They are available by post from **C. M. Howes Communications, Eydon, Daventry, Northants NN11 3PT** or by telephone on **(01327) 260178.**

For further information contact: Dave Howes G4KQH on the above number.

## TRANSFORMERS FOR VALVES

A range of transformers specially designed to meet the needs of the resurgent valve market has just been launched by Variable Voltage Technology Ltd.

Aimed at electronics and amateur radio enthusiasts, the new VTM range is manufactured by VVT to traditional requirements but using modern methods and materials, including high grade annealed copper wire and high

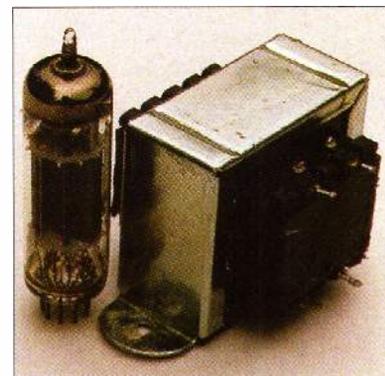
quality grain orientated laminations.

VTM transformers have been designed to give low flux density to ensure reduced magnetic fields. They meet the requirements of the EMC and low voltage directives, CE marking is available where appropriate.

The range can be specified for either frame or vertical mounting, they are designed for use in the following situations;

- mains transformers for h.t. circuits with or without filament windings
- filament transformers
- mains smoothing chokes
- output transformers - with triode or pentode connections or for use in ultra linear mode. EL34 and EL84 valve types are catered for and various impedance tapings are available.
- grid coupling transformers - fully screened, single ended or push-pull.

VVT is a specialist transformer design and manufacturing company that can customise its standard range transformers to meet non-standard requirements. For more information please contact: **Variable Voltage Technology Ltd., Unit 24 Samuel Whites Estate, Medina Road, Cowes, Isle of White PO31 7LP. Tel: (01983) 280592, FAX: (01983) 280593.**



# OOPS!

**UHF CB is to be withdrawn with effect from 31 December 1998 not 1996 as stated in last month's Communique.**

## WACRAL CONFERENCE

The gremlins got at the telephone number given in last month's SWM. The correct telephone number is **(01474) 535686** and the contact name is G4EZU (QTHR). Our apologies for this mistake.

NEWS:NEWS:NEWS:NEWS:NEWS:

## ACARS GURU VISITS MATLOCK

Low Electronics at Matlock, Derbyshire, were recently honoured by a visit by Aircraft Communications Addressing and Reporting System (ACARS) expert Ed Flynn (seated in picture) from San Francisco, California. Ed is the author of *Understanding ACARS*, the only comprehensive book in the world for enthusiasts on the monitoring and decoding of ACARS (SWM Book Store carries this title - see p.80).

The ACARS is a digital radio data system becoming widely used by airlines for passing engineering and flight management information between aircraft and ground stations. Signals can be received by any airband scanner, but a special interface and software is required to decode the messages onto a PC. The Low Electronics



Airmaster product has been widely sold all over the world to aircraft enthusiasts for this purpose.

Having decoded the data transmission, the real challenge is to interpret it, and that is where Ed's book is essential. In the book Ed gives details of all the common message types with an explanation of how to unravel them, together with extensive information from his own research efforts and enthusiast groups with whom he exchanges notes.

Ed was on a visit to other ACARS decoding enthusiasts in the UK and called into Low Electronics in Matlock to discuss enhancements to the Low Electronics Airmaster product.

## HAREC LAUNCHED

The RA has just announced that UK radio amateurs who wish to operate abroad for periods in excess of three months, and obtain a foreign amateur radio licence will be able to enjoy a simplified procedure.

Countries who have implemented the appropriate CEPT Recommendation will issue upon request, mutually recognised Harmonised Amateur Radio

## RAE COURSES

### Arnold & Carlton College, Digby Avenue, Mapperley, Nottingham.

A full **RAE** course of 27 weeks starts on **Wednesday 11 September**. Every Wednesday, starting at **7pm** for two hours. Details from **Alan Lake G4DVW** on Tel/FAX: **0115-938 2509**.

### Avondale Centre, Cheadle Heath, Stockport, Cheshire.

**Morse classes** commencing **early September**. For more information contact **the Avondale Centre** on **0161-427 7733** or from the Course Tutor **G3KAF** on **0161-439 4952**.

### Bexley College, Tower Road, Belvedere, Kent DA1 6JA.

An **RAE** course commences **September 1996** consisting of evening classes for Morse Tuition, Transmitting Theory, Operational Procedures, Licence Regulations and Short Wave Receiving. The course will run until May '97 preparing for the May examinations. The course will cost **£78** and will be tutored by **Colin Turner**. More information and enrolment form from **Guidance & Admissions Centre** on **(01322) 442331 Ext. 3888** leaving your name, address & telephone number.

### Bradford College, Hanson School, Sutton Avenue, Five Lane Ends, Bradford 2, West Yorkshire.

A **Morse** course commences on **September 18** for **30 weeks**.

Examination Certificates - HARECs to those who have passed a relevant national exam. In the UK, Class B HARECs will be issued to anyone who passed the RAE and Class A HARECs will be issued to those who have passed both the RAE and the RSGB's 12w.p.m. Morse Test.

Additionally anyone who currently holds or has ever held a full UK Licence will be eligible to apply, whatever their original qualifications.

## FOX HUNT!

To cater for the high level of interest in d.f.ing in the Worcestershire, Warwickshire and West Midlands areas a new group has been formed. The Arden Forest Direction Finding Group have joined together as an informal group.

They wish to extend an invitation to all who wish to take part in this aspect of radio. Currently the group are holding two events per month using the 144MHz band. Though other bands can be used.

The events to date have been held in the geographical area

covered by the north-west quarter of *OS sheet 151*. Typical 'fox hunts' have been held in the evening and last about an hour and a half, followed by a convivial half hour in a convenient hostelry. There are no qualifications for entry to the group, except to have an interest in 'Fox hunts'. Whilst it is useful to have your own equipment, it is not essential, since the organisers have equipment for loan or you could team up with another member. Anyone who is interested should contact:

### Macclesfield College of Further Education, Henbury High School, Whirley Road, Macclesfield.

An **RAE** course will commence on **Tuesday 10 September** and thereafter every Tuesday until May 1997. Each session will start at **7pm** and end at **9pm**. Enrolment is at Ryles Park campus, week commencing **3 September 1996**. Details from **Gordon Adams G3LEQ** on **(01565) 652652**.

### Newbury Technical College, Wiltshire.

An **RAE** course starts on **September 12** and will run on subsequent Thursdays from **7 - 9pm**. A **Morse Code for Amateurs** course to reach 12w.p.m. starts on **Tuesday 7 January 1997** from **7pm to 8.30pm**. More details from **Newbury College** on **(01635) 35353** or **Ray Oliver G3NDS** on **(01672) 870892**.

### North Cheshire Radio Club, Morley Green Club, Mobberley Road, Wilmslow, Cheshire.

**RAE** classes commence on **Sunday 8 September** and

thereafter every Sunday evening. Sessions will commence at **7pm** and finish at **9pm**. Enrolment takes place on Sunday 8 September 1996 or on any following Sunday. More details from the Course Organiser **Gordon Adams** on **(01565) 652652**.

### Swindon Technical College, Wiltshire.

On **September 16** an **RAE** course starts and will run on subsequent Mondays from **7 - 9pm**. Contact **Swindon College** on **(01793) 4983000** or **Ray Oliver G3NDS** on **(01672) 870892** for more details.

### Warrington College Institute, Winwick Road Campus, Warrington.

An **RAE** course in preparation for the May 1997 exam begins on **September 12** from **7 - 9pm**. Enrolment for the course takes place from **September 3 - 6th**. **Gordon Adams G3LEQ** is the Course Tutor and more details can be obtained from Gordon on **(01565) 652652**.

### West Notts College, Derby Road, Mansfield.

**RAE** classes on **Monday evenings, 7-9pm**. A 27-week course starts **9th September**. Details from **Alan Lake G4DVW** on Tel/FAX: **0115-938 2509**.

### J. Porter G4OHJ, 77 Westholme Road, Diford on Avon, Alcester, Warwickshire B50 4AN.

## MULTICOMM ADDRESS

SWM advertiser Multicomm 2000 have recently move to new premises. Their new address is: **Multicomm 2000, Unit 3, Cambridge Street, St. Neots, Cambridgeshire PE19 1PJ. Tel:/FAX: (01480) 406770.**

## AOR AR7030

The recent three-part AOR AR7030 competition has now been drawn!

We are pleased to announce that Mr P. Mitchell of Newbury was first out of the hat. Well done Mr Mitchell, you will be soon the proud new owner of this superb communications receiver.



# Junior Listener

## Short Wave Rallies

### \*September 1:

The Bristol Radio Rally is being held at Brunel Centre, Temple Meads Station, Bristol. Doors open at 10.30am to 4pm (disabled 10.15am). Admission is £1. There is ample under-cover parking, refreshments, large Bring & Buy and talk-in on S22. **(01275) 834282.**

### September 1:

The Telford Radio Rally will be held at the Telford International Centre. Two large, purpose built exhibition halls offer a day for the whole family. Main dealers are already booked along with a Bring & Buy, flea market and many special interest groups represented. Parking is on site and it is easy to find, just off the M54 motorway. Further details from **Tony 2E1DXR** or via **GB7PMB** on **(01743) 235619.**

### September 7:

The Annual Wight Wireless & Computer Rally is to be held once again at Arreton Manor, near Newport, Isle of Wight between 11am and 5pm. There is no charge for admission to the Wireless Museum or the extensive gardens, lawns and grounds, with plenty of free parking. There is no charge for trade stands or the Bring & Buy sale, so bring all your surplus equipment. There will also be a collection for the Radio Invalid & Blind Club. The cafeteria will be open for the much needed 'cuppa'. Talk-in on S22. Further information on **(01983) 567665.**

### September 8:

Middle Wollop 'Boot Sale' - Museum of Army Flying, Middle Wollop on the A343 between Andover and Salisbury. Admission and parking free for buyers and £5 a pitch for sellers. Talk-in on S22. Open 10am to 3pm. Details on **(01264) 391383** anytime or **(01890) 629346** evenings only.

### \*September 8:

The 15th Lincoln Hamfest will be held on the Lincolnshire Showground. Entry fee, £1.50. Morse test available, plus all usual attractions. Caravans welcome (Saturday night only). **Sue Middleton** on **(01522) 525760.**

### September 15:

The Central Lancaster Radio Rally are holding their rally at the Central Lancaster High School, Crag Road, Lancaster, five minutes from Junction 34 on M6 motorway. Doors open at 10.30am and the entrance fee is £1. **Susan** on **(01524) 64239** or **(01384) 896199.**

### September 15:

The East of England Rally is to be held at the East of England Showground, Peterborough, Cambs. Doors open at 10am. Further information from **Vince G8NGZ** on **(01733) 331211.**

### \*September 21:

The Scottish Amateur Radio Convention is being held at the Cardonald College, Glasgow. The West of Scotland Amateur Radio Society is hosting the convention, with the support of other local societies. Find out more details by contacting **Ron King GM7BOW**, Organisational Secretary, on **0141-773 2882.**

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

Well, the summer months definitely seem to be slow for QSL cards, perhaps lots of the broadcast station staff are away on their annual holidays as well. The only ones I've heard from this month are VoA (Voice of America) and China Radio International (CRI), although fortunately both of them sent copies of their bi-monthly magazines for me to look at.

VoA Guide is a 12-page newsletter that is mostly filled up with schedules and programme information, but there is also a couple of pages of letters from listeners. Their letters editor is called Dr Feedback! Anyway, Dr Feedback is looking for suggestions from listeners for topics for the 20-minute or 30-minute programmes of the sort that VoA already do. If you look

at a schedule you will see that their day is broken up into 20 or 30 minute segments with 10 minute news programmes added in. Here's an example of their broadcasts targeted at Europe for Mondays:

0400-0410 News  
0410-0430 VoA Business Report  
0430-0500 Stateside  
0500-0510 News  
0510-0600 VoA Today  
0600-0610 News  
0610-0700 VoA Today  
1400-1410 News  
0410-1455 Asia Report  
1455-1500 Editorial  
1500-1510 New  
1510-1530 Newline  
1530-1600 Music USA

I'm sure you can see now how they build up their day of

programmes. They have documentaries and reports on all kinds of subjects, but if you are a regular listener you may feel there is a gap in their programming. In their letters page I read an interesting idea. A listener from Newcastle-upon-Tyne suggested that they have a broadcast a day on the life of different people around the world as this would break a few myths surrounding the way certain cultures live. If you have any suggestions, then write to **Dr Feedback, Voice of America, Washington DC 20547, USA.**

The Messenger is the bi-monthly paper from CRI. This is mainly a general interest paper, with bits and pieces about CRI programmes and personalities. It actually makes good reading, whether it's the recipe you're

## Who To Listen For

If you are just starting out listening, the first stations you try to QSL you want them to be easy to find and preferably quick to QSL. So who should they be?

In Europe, I would say that stations like Radio Nederland, Radio France International and Deutsche Welle. They all QSL reliably, welcome listeners reports and comments and generally look after their listeners. Radio Nederlands need to be tracked down in the mornings, between 1030 and 1225 on either 6.045 or 9.65MHz. Their QSL address is: **Radio Nederlands, English Dept, PO Box 222, 1200 JG Hilversum, The Netherlands.**

Radio France International broadcasts mostly in French, but there are some English broadcasts. Try them around lunch-time between 1200 and 1255 on 9.805, 15.155 or 15.195MHz. If you enjoy listener participation programmes, then listen out for Club 9516 often aired at weekends, Their QSL address is **Radio France International, BP 9516, F-75016 Paris Cedex 16, France.**

Finally in my European choice it's Deutsch Welle. Try for them in the evenings from 2000-2050 on 7.170 and 9.615MHz You'll find an interesting mix of News and documentaries that vary depending on the day of the

week. This can be useful because of you find a feature you enjoy, if you tune in again the next week it will be the same feature with a new programme - for example they used to run a Science and Technology piece every Wednesday that was interesting. Their QSL address is: **DW, Postfach 10 04 44, D-50588 Cologne, Germany.** Now, last year DW said they were going to get rid of their short wave broadcasts to Europe in favour of satellites. They haven't gone yet, but perhaps now is a good time to listen out and get their QSL card.

Stations outside Europe to listen for are ones like Voice of Russia, Radio Canada International, Radio Budapest International and perhaps something more difficult like KOL Israel.

The Voice of Russia is the new name for the old Radio Moscow that most people have heard of. They have suffered huge cut-backs in recent years, but are still transmitting and the best time to log them is in the late afternoon. Try 1600-2000UTC on one of several frequencies - 9.48, 9.82, 11.63 or 11.675MHz. There have been some musical programmes just after 1600 at the weekends that have been interesting. Their QSL address is: **Voice of Russia, ul Pyatnitskaya 25, Moscow 113326, Russia.**

Radio Canada International is

another broadcaster still going despite struggles. Late lunch-time is the best here, 1330 -1400 on 15.315, 17.820 and 17.895MHz. I have heard that they have speeded up their QSL process because not so long ago you had to be very patient. The address if you want to contact them is: **Radio Canada International, PO Box 6000, Montreal PQ, H3C 3A8 Canada.**

Radio Budapest I've mentioned in recent months, they broadcast mid-evening 2100-2130 on 3.975, 5.935, 7.25 and 9.835MHz. Their address is **Radio Budapest, H-1800 Brody Sandor u 5-7, Hungary.**

Finally in this section KOL Israel. Try in the evenings around 1900 on 7.465, 9.465 and 11.603MHz. Their QSL address is **KOL, PO Box 1082, 91 010 Jerusalem, Israel.** I haven't tried to get a QSL card from KOL for a while now so I'm not sure how fast they reply. I have heard that they are reliable though.

Don't forget to make it a good report and tell these stations if you are just starting out. Many of them will be tolerant of mistakes and will point out where your report is weak. Let me know how you get on, who QSL the fastest and slowest and who are the most generous stations.

**Elaine Richards,  
PO Box 1863,  
Ringwood,  
Hants  
BH24 3XD.**

copying or reading about Wei Lin, their English language announcer. There aren't many broadcasts from CRI to Europe so you have to time your listening carefully, although you can often pick-up broadcasts meant for other areas. So try 2000-2200 on 9.92 & 6.95MHz 2100-2130 on 3.986MHz 2200-2300 on 9.88MHz

As radio waves don't read the schedules, the African signals can be worth trying for if conditions are good.

1600-1700 on 15.130, 15.110 & 11.575MHz  
1700-1800 on 7.405, 9.570 & 11.910MHz  
1900-2000 on 9.440 & 11.515MHz  
2000-2100 on 9.440MHz  
2000-2130 on 11.715 & 15.110MHz.

They seem to QSL well and so are worth adding to the collection: **CRI, English Dept, Beijing, China 100866.**

## AVON

**Bristol International RC:** Tuesdays, 8pm. The Black Horse Public House, West Street, Old Market, 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. August 27 - Electromagnetic radiation & your health, September 24 - EMC in aircraft. Dave Bailey G4NKT. 0117-967 2124.

**South Bristol ARC:** Wednesdays, 7.30pm. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. August 28 - Preparation for Bristol Radio Computer Rally, September 1 - Sunday - Brunel Train Shed Radio Computer Rally, 4th - Make your own J pole, 11th - Review of Bristol Radio Computer Rally, 18th - 2m challenge - work all Bristol postal codes, 25th - Bring & Buy care boat sale/committee meeting. For more information ring (01275) 834282 on a Wednesday 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.

## DEVON

**Appledore & DARC:** 3rd Mondays, 7.30pm. Appledore Football Clubroom. September 16 - Talk on 10GHz by Doug G3ATM. Dave Brierley G3YGI. (01237) 476124.

**Exmouth ARC:** Alternate Wednesdays at the Scout Hut, Marlpool Hill, Exmouth. August 28 - Talk on rally hunting by Derek Dell G4WLA, September 11 - Away visit (still being arranged), 25th - Junk sale. D. Fox GONRR on (01395) 271880.

**Torbay ARS:** Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. August 23 - Club BBQ night, September 20 - Monthly meeting. Peter G4UTO. (01803) 864528.

## FIFE

**Dunfermline & DARC:** Thursdays, 7.30pm. The former RAF radio station, Outh Muir, located by the A823 Dunfermline to Crief Road, one mile from the Knockhill Racing Circuit. August 29 - HF operating evening. Adrian Donaldson G6MSRD on (01383) 735967.

## GREATER LONDON

**Edgware & DRS:** Thursdays, 8pm. Wailing Community Centre, 145 Orange Hill Road, Burnt Oak. August 22 - SSB Field Day briefing. Stephen Slater on 0181-953 2164.

**Southgate ARC:** 2nd & 3rd Thursdays, 7.30pm. The Pavilion, Winchmore Hill Cricket Club, Firs Lane, Winchmore Hill, London N21 3ER. August 22 - Radio on the air, d.f. equipment check, September 26 - Great ERG race at the Winchmore Hill Cricket Club. M. E. Viney G0ANN. (01707) 850146.

## HAMPSHIRE

**Horndean & DARC:** 1st & 4th Tuesdays, 7.30pm. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. August 27 - American supper, September 3 - Natter night, 24th - SUNPAC by John G8OQN. 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.

## HEREFORD & WORCESTER

**Bromsgrove ARS:** 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. August 27 - DF hunt (on foot), September 10 - Technical topics, 24th - Talk - 2m contesting in the 60s by D. Browning G3UEY. Barry Taylor. (01527) 542266.

**Droitwich Spa ARC:** 1st Tuesday, 8pm. Droitwich Community Hall. Many interesting evenings already booked. September 3 - AGM. John Jackson G4OPV (01299) 826188.

**Malvern Hills RAC:** 2nd Tuesdays. Red Lion, St Annes Rd. Jim Davis G0OWS. (01684) 576538.

## HERTFORDSHIRE

**Hoddesdon RC:** Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. August 29 - BBQ and talk on astronomy by Brian Bond G3ZKE from 6.30pm. Everybody welcome. Don G3JNJ on 0181-292 3678.

## 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

**Bromley & DARS:** 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. September 17 - Equipment test evening. A. Messenger G0TLK. 0181-777 0420

**Medway AR & TS:** Fridays, 7.30pm. Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham, Kent. September 7/8 - Strood Steam Festival, 20th - Alan G1OMH CTCSS in radio G3VUN, 40 Linwood Avenue, Strood, Rochester, Kent ME2 3TR. (01634) 710023.

## LANCASHIRE

**Wigan Douglas Valley ARS:** 1st & 3rd Thursdays. Wigan Sea Cadet HQ, Training Ship Sceptre, Brookhouse Terrace, off Warrington Lane, Wigan. D. Snape G4GWG on (01942) 211397.

**Preston ARS:** Thursdays, 8pm. The Lonsdale Sports & Social Club, Fulwood Hall Lane, Fulwood, Preston. August 29 - Quiz night on radio topics, September 12 - General discussion evening, natter night and G3KUE on the air, 26th - Auction evening, a sale of members surplus equipment. Eric Eastwood G1WCQ. (01772) 686708.

## 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. August 28 - Night on the air, construction QRP and Morse practice, September 4 - RAYNET by Sue Brodie G0PSY, 11th - Night on the air, construction QRP and Morse practice, 18th - Science for all by G3PTB, 25th - Night on the air, construction QRP and Morse practice. Mike G4EOL. (01603) 789792.

## NORTH YORKSHIRE

**Hambleton ARS:** More details from September 5 - Video, 19th - Operating night, all bands and modes. John G0VXH on (01845) 537547.

## NOTTINGHAMSHIRE

**Mansfield ARS:** 2nd Mondays, 7.30pm. Pre-Ashfield Show update. September 9 - Data communications forum, a chance to find the answers to all those questions you wished you had asked. Novices particularly welcome. David Peat GORDP 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.

## SHROPSHIRE

**Salop ARS:** Thursdays, 8pm. The Telesports Club, Abbey Foregate, Shrewsbury. August 29 - Telford rally

preparation, find out how you can help to run the rally. Ian Davies G7SBD, QTHR. (01743) 463711.

## SOMERSET

**Yeovil ARC:** Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. August 22 - Other members' stations by G7SDD, 29th - Club station on the air and committee meeting, September 5 - Final arrangements for field day by G7WAL, 12th - Club quiz, 19th - Matching with coax by G3KSK, 26th - Club station on air and committee meeting. Cedric White, QTHR. (01258) 473845.

## WARWICKSHIRE

**Stratford-upon-Avon & DRS:** 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. September 9 - Members topics evening, 23rd - Castle Electronics, bring your equipment along for checking and see the latest rigs. The Society are again organising 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 MIDLANDS

**Sandwell ARC:** The Broadway, Warley. RAE class on Monday nights, Morse class on Wednesday nights and RAE Novice class on Thursday nights. Three operating shacks, h.f./v.h.f./u.h.f., Phone, c.w., RTTY, AMTOR, Packet, all bands. Talks, outings, contest and demonstrations. Full RAE course commencing September, enrolment Thursday 5th at 7.30pm and course commences Thursday 12th at 7.30pm. Club nights Mondays, Morse classes on Wednesday nights. For further information please ring 0121-552 4619/0121-552 4902.

## WEST YORKSHIRE

**Wakefield & DRS:** Tuesdays, 8pm. The Ossett Community Centre, Prospect Road, Ossett. August 27 - On the air, September 3 - Contest preparation, 7/8th - 144MHz trophy contest, 10th - On the air, 17th - War Office 'Y' Group - Ray Snell, 24th - Using the antenna analyser by G0DJA. Bob 0113-282 5519 or G3WWF@GB7WRG.

## WILTSHIRE

**Trowbridge & DARC:** 1st & 3rd Wednesdays, 8pm. The Southwick Village Hall, Southwick, Trowbridge. September 4 - Home construction and an introduction to magnetic loop antennas by G0AYD. Ian G0GRI on (01225) 864698.

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

# Grassroots

# 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.**



## Editorial

### RALLIES

In my Editorial last month I mentioned a couple of rallies - Dayton and Freidrichshafen - that still manage to attract large numbers of amateurs. Since returning from these I have attended a couple of one-day rallies in the UK. I get the impression that the number of radio amateurs going to these events is falling rapidly. If this is true the organisers of all amateur radio rallies in the UK need to ask themselves a simple question - "why is this happening?"

Are there too many of these events? Are they becoming too computer orientated and drifting away from radio? Is the hot weather we have been having keeping people away? Are radio enthusiasts faced with less and less money to spend on their hobby - so that staying away removes the temptation and frustration?

Although I have said that the question is simple, the answers are far from simple and I have no palliatives to offer. But, I am very interested to know what you think, so please write and let me know why you go to rallies - or why you don't.

### RADIO ROVERS

With the football season almost upon us the article on Radio Rovers, the Blackburn Rovers Football Club radio station, should be of interest to those of you who follow such sports. I know that our Art Editor perked up when I showed him the selection of transparencies for the front cover. The choice of picture came down to just two - probably because he supports QPR and the second player in the picture is one of theirs! I wouldn't know - I support Damon Hill!

**Dick Ganderton G8VFH**



### Dear Sir

I would like to thank you for the article on the Billboard Antenna. I rang several outlets for materials needed, but did not have any luck. So, I put my thinking cap on and decided to make my own.

I found an old polystyrene tile, 18 in square, onto which I pasted thin card on each side to make a pretty strong board. I then found a multi-strand length of earthwire. Having copied all the measurements from the plan in SWM, I cut the lengths to size, tacked them to the board with a bit of sticky tape, soldered all joints (by the way I did this both sides of the board) and hey presto, after connecting the coaxial cable, I had a great antenna that cost almost nil. Hoping this may help some fellow SWM readers who have had no luck trying to locate the materials.

**C. Phillips  
Ilkeston, Derbyshire.**



### Dear Sir

I am a very dedicated s.w.l. from over in the colonies, Pickerington, Ohio, about ten miles east of Columbus, Ohio. I really enjoy your magazine, especially John Wilson, a UK treasure. I read John's column with relish, he is first class and I enjoy his combination of knowledge and wit!

While I am primarily a 'below 30' listener, I recently went for one of those d.c. to daylight receivers, the AR8000, a fine all-purpose receiver. I would hope to add a comment for the also enjoyable article by Peter Rayer, 'Longwires and Scanners'. My comment is down to knowledge grabbed from John Wilson's article in SWM Sept. 1995, page 30, 'And things that go bump in the night'. No slight meant against another good Englishman, Peter Waters and the Global 2000 a.t.u., either. Peter has treated me great and among the UK products purchased from Peter was the Global.

The authors and I do have a lot in common as I, too, am lucky enough to spend 90 plus hours a week on my s.w. equipment and as a supplement to my Lowe 150 Europa, I use a JRC 535D and a Drake or two. This Datong active antenna may very well perform

on his 535D, but would be expected to overload the AR3000.

These d.c. to daylight receivers do need some assistance with extra circuits to help the front-end. But in place of the heavy duty large h.f. antennas mentioned by Peter Rayer, might I suggest another good balun (or unun) for use on the wide band receiver and a good pre-selector in place of the a.t.u.

While it is true that the a.t.u. will add some improved selectivity advantage, the primary role here sounds to me to be more in the preview of a pre-selector and a smaller balun antenna such as the RF Systems EMF (electro-magnetic field) antenna. Not only is the EMF very friendly with smaller portable receiver, it does deliver a good signal level for my AR8000, especially when paired with a good pre-selector such as the Palomar P-508. A small passive pre-selector such as the MFJ-16010 will do a good job, but I just prefer the variable gain/attenuation available with judicious use of the P-508 gain control.

I do use an active antenna periodically on my JRC 535D, but my RF Systems DX One Pro would also blow away the front-end of my AR8000. A passive balun antenna, 5m or so long and a good pre-selector will allow the wide band receivers to perform rather well for s.w. broadcast listening.

Keep up the good work and my best regards to Peter Waters, John Wilson and the *Short Wave Magazine*, you are all first class. Not to forget your author Peter Rayer, he has performed a worthwhile service in promoting the wide band receiver with his fine article.

**John T. Wagner  
Pickerington, Ohio.**



### Dear Sir

I am the owner of an Icom R71E radio - a very nice machine. I recently encountered a problem, though, when I bought a FAX machine. It was made to BABT standards, fulfilled FCC regulations and seemed quite well made.

I switched it on and 'Bingo!' Royal Mail strikes neutralised. I decided to listen to bing bongs on the aircraft bands and what did I

hear, a very irritating hiss, loads of QRM, sometimes continuous, sometimes intermittent, at various speeds. I then decided to place my FAX machine next to or near to the bed and noticed, purely by chance, that the interference on the radio coincided with the FAX machine. I realise that, okay, FAX machines may, in the past, have radiated energy but this one did say 'satisfies BABT and FCC standards', so do PC computers. Those standards cannot be set very high, or BABT and FCC are not doing much QA work.

NB: Of course, I still use the FAX, how else could SWM have received this letter.

**K. J. Faulkner  
Sale Moor, Cheshire.**



### Dear Sir

To N. L. Smith's wise comments in the June issue of SWM concerning restoration of the Racal RA17 I would add the following:

1. The handbook really is essential if you are replacing much more than a fuse or a valve. The circuit is complex, and although the case dimensions (not to mention the weight) are substantial, the chassis is quite densely populated with components. The front-end and the second v.f.o. are each on a separate diecast chassis, which has first to be removed to gain access to the components inside. The stipulated removal method must be used to avoid damage.

2. The Services version of the 17L has had up to 26 modifications depending upon the history of the set and you need to know what has been done before poking around inside.

3. Alignment is long and tedious and requires 1) a decent signal generator such as a Marconi TF144H, HP 606B or better, 2) a frequency counter, 3) an audio output meter (though you can't use the set's meter), 4) a non-metallic trimming tool and 5) an i.f. sweep generator to align the crystal filters.

4. Don't even consider adjusting the 40MHz bandpass filter and preferably do not touch the 37.5MHz loop filter. There was a special wobulator made for the job by Samuel & Hutton, but they are now rare, ancient and are even bigger than the 17 itself! The experienced technician

would now use a spectrum analyser with a tracking generator, but how many SWM readers have access to one? The good news, however, is that the set will usually hold its alignment for a considerable period, and the handbook carries a warning to leave the alignment alone until all other sources of insensitivity have been eliminated.

5. The 17 is but part of a much more complex system. There are numerous adapters and add-ons, such as a pre-selector, s.s.b. and v.l.f. adapters, spectrum display, f.s.k. terminal, diversity switch, frequency measuring system, synthesisers, an ultra high stability crystal standard, D/Fing and others. For serious listening, an s.s.b. adapter will turn an indifferent set into an excellent machine. Examples are the RA63 and the RA218. The audio is very clean, particularly with modern stereo headphones wired for mono. Forget the dreadful old DLRs and other lumps of uncomfortable Bakelite. The 17 is sufficient stable to receive a.m. as s.s.b., but you will need a steady hand tuning. Some adapters such as the RA121 and RA98 even have reasonable a.f.v. built-in.

6. I personally like the big chunky knobs, the film scale and the feeling of quality. A 19in rack full of such gear is an enviable sight, though relatively few will have the room to accommodate it. Most modern rigs are positively flimsy in comparison and look more at home in the living room alongside the f.m. tuner and hi-fi amplifier. I once met a Royal Signals Special Operator and he swore by his 17L despite having to hand an enviable choice of much more modern equipment. The moral is that the 17 is still an excellent set, but you need to know how to drive it and to keep it up to spec.

**Michael O'Beirne G8MOB  
Long Ditton, Surrey.**



#### Dear Sir

At the age of sixty eight, I have now clocked up some fifty odd years as a short wave listener and have not yet tired of the hobby, starting as a boy when my father got a brand new Ultra domestic radio. It cost ten pounds, quite a lot of money in those days, but worth every penny.

No longer did I have to take the accumulator to be charged at the local wireless shop, watching him tune into stations had me spellbound and the neighbour's too. Besides having push buttons

for the band change, it had a large illuminated dial with the station names all over it, Lyons, Helsinki, Budapest, Munich, BBC Europe, etc., along the bottom was a scale with two sets of numbers in metres and MHz and marked Short Wave.

Dad never bothered to try these, he said it was just foreign rubbish. It was some time before he noticed that one of the white band change buttons was getting quite grubby, the one with the letter S on it.

For once, my big brother didn't rat on me, but Dad put it up on a high shelf along with a final warning, a bad move on his part for with a ladder back chair, it was quite easy to reach and also gave me a vantage point to spot him coming home, when I could make a hasty retreat to my Meccano set on the floor. The hazard in this was making sure the radio was spot on frequency where he left it.

I would wait with bated breath for those valves to warm up for the evening news when silence fell on the household. A few times Mom apologised for disturbing it while dusting, for which I black leaded the grate.

What great changes since the days of Dad's Ultra with five buttons. What he would make of the radio I use today with six slide controls, a rotary tuner and sixty seven buttons in a variety of colours and that's a modest Sony.

I derive a lot of pleasure tuning around the ham bands and tweaking the stations in, finding QTHs in the callbook, sometimes sending reports to people. I have been snubbed occasionally, but that's fine.

I enjoyed listening to them and doing my part. That small irritation aside, I have noticed (perhaps more so since I embarked on a course for the RAE) that there is little regard for proper use of the phonetic alphabet. Besides being an important part of the course, it does come up in the exam, given a multiple choice question on my paper, ie. Letter: O. October, Ontario, Ocean, Oscar.

What would I do? Put in one of my own, Omiga? or choose from the variety I hear the professionals using? Recently I started to take notes on alternatives being used. I have almost got three complete phonetic alphabets already, Queen, Nancy, Vicar, London, Austin, even Item!

I wonder how many other s.w.l. and licensed operators find this practice of being slick not only annoying, but also very sloppy radio procedure. Isn't it a bit like obeying the rules until

you get your driving licence, then please yourself?

Please, licensed operators, I am looking to you for examples of good practice on my way to a possible pass.

**Ron Greatrix  
Cannock, Staffs.**



#### Dear Sir

Regarding a query about a piece of radio equipment I purchased from my local car boot sale for the sum of £3. The trouble is, I don't know what the radio is for. Maybe you or your readers can help. The set is an 'FM Wireless System Receiver Sound Lab WMS.202'.

The set has just one channel, 174.50MHz f.m. This channel makes a sound like a computer and it's not very good to listen to. Would it be possible to swap this channel for one of interest, for example, airband or maybe the receiver isn't a receiver at all. If it is a receiver, how would I get the frequency most appropriate for me?

I have been reading SWM for nine years. I get my copy from my local WHS at my QTH. I have Trio R1000 - VT225 - Sony 7600 & 7600S, a search and amateur band receiver PRO34. Hope you can help.

Keep up the good work. I like 'SSB Utility Listening' and 'Scanning'.

**M. Tansley  
Bradford.**



#### Dear Sir

I would be most grateful if you could help me. I have a Racal receiver and a Harmon Kardon receiver. In the evening, I like to listen to a London station Country 1035AM on the medium wave. Unfortunately, the receivers are picking up a number of Scottish and Italian stations transmitting on the same frequency.

Could you please advise me on some sort of rotating loop aerial that would beam onto the London transmitter and obliterate the others.

**R. Matthews  
Wolverhampton,  
West Midlands.**

*There have been many designs published in SWM over the years. The Rainbow Loop by the late Bill Wilson - SWM September 95 - could well fit the bill. Ed.*

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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.

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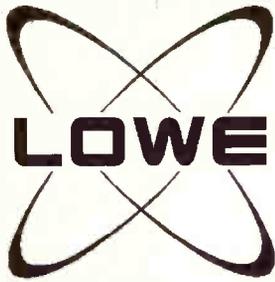
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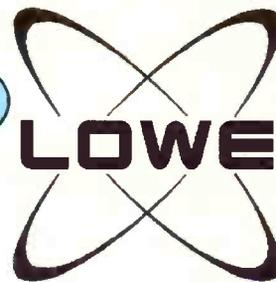
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# What is Utility Listening?

*The term 'SSB Utilities' covers a very large area of the h.f. spectrum, probably larger than most people ever thought. Graham Tanner, our 'SSB Utility Listening' columnist introduces the subject.*

If you consider that the h.f. frequency range covers from 0 - 30MHz, then 'SSB Utilities' can be thought to be "everything which is not a 'Radio Ham' or 'Broadcast' signal". When you look at the h.f. spectrum statistically, the percentages are a lot more informative. Amateur and Broadcast allocations account for just under 30% of the spectrum, depending upon which ITU region you live within. Therefore, the other 70% contains 'utility' signals. The various ITU regions of the world have slightly different frequency allocations for their 'broadcast' and 'amateur' allocations, but even these minor variations do not alter the final figures by very much.

The signals which are usually thought of as being 'utilities' cover a large number of categories, such as aeronautical, marine, fixed point-to-point links, beacons, weather broadcasts and 'spy' stations. They also use just about every transmission method ever invented - side-band (upper-, lower-, and double-), Morse (c.w.), FAX, radio tele-type, SITOR, AMTOR, a.m., and all the fancy new computer modes (e.g., CLOVER and PACTOR) that have appeared in recent years.

## Starting Out

You can start very easily and cheaply with a simple portable receiver, costing as little as £100. With this kind of receiver, you are almost certainly going to be limited to listening for a.m. and s.s.b. signals, but it is possible (just!) to decode a few digital signals. Whatever make and

model of receiver you have, it must have the ability to receive sideband signals, so look for a control marked 'BFO' or 'SSB'.

Once you have discovered the joys of listening to utility stations, you can easily move up to a more complex (and possibly sensitive, and certainly more expensive) receiver. Then, you can also start to investigate some of the more complex transmissions - those that require some form of interface of decoder before the signal becomes intelligible. In time, you will probably want to move up to an expensive 'all singing, all dancing' receiver, possibly costing thousands of pounds (the current 'most expensive' receiver is probably in the 4000-5000 region), and able to be controlled by a computer.

Almost without exception, utility signals are transmitted for the benefit of the professional user. Air Traffic Control over the north Atlantic are destined for the professional pilot, maritime navigation warnings are destined for mariners around the coastline, and point-to-point links are destined for the professional users at either end of the link. The fact that all of these signals are easily received on quite modest equipment means that there is a huge interest in them. Almost certainly, the biggest single user of utility signals is the military. Civilian signals, which are principally air traffic control or maritime frequencies, almost always stay on their assigned frequencies - this makes them relatively easy to locate and listen to. The military, on the other hand, have a series of 'published frequencies', and a vast array of

'discrete frequencies' where they can go about their business.

One of the more common questions that I am asked, especially by people who are unfamiliar with radio communications, is to name some of the 'interesting' signals that I have heard. The term 'interesting' means many things to different people, but I usually tell people that I have heard the Space Shuttle astronauts, the US Secretary of State talking to Middle-Eastern leaders to discuss their peace-plans, so-called 'spy stations' from Eastern-bloc nations and also NATO countries including the UK, and finally, scientists in Antarctica. A few years ago, I used to delight in telling people that I heard the start of the Gulf War, but nowadays I try to mention things which are more recent, and likely to mean something to them. All the above signals are voice transmissions, but when I tell people that I can also 'hear' Press and News broadcasts, and decode FAX weather maps, and sometimes weather satellite photographs, their next comment is that I must have a house like Jodrell Bank! Actually, I've only got two external antennas - a G5RV for h.f. and a 'simple' collinear vertical for v.h.f. and u.h.f. and everything else. Occasionally, I am asked by knowledgeable Radio Amateurs about the signals that I can hear. I usually try to impress them with a list of countries that I can hear easily - countries that are considered extremely rare for radio hams. Stations in countries such as Somalia, Ethiopia and Saudi Arabia can be heard every

night in the aeronautical bands. On the Marine Bands, you can hear almost any country in the world, including some which do not even have a coastline! Then, when I explain to the radio ham that it is easy to QSL these stations with a very good chance of a reply, they seem to want to change the subject! Hey Hams, when was the last time that you saw a QSL from Vietnam. Or Burma, or Somalia?

## Background

I first really got interested in Utility listening in the early 1980s, but my knowledge of short wave goes back to the late 1960s. My father had an old War Department short wave receiver, possibly an R107 but I'm not 100% sure; I have a memory of listening through an old pair of headphones to a radio station in China early one morning before going to school. In the early 1980s, I got the 'CB' bug, and that made me ask about the old R107 radio. This was dug-out, dusted-off, and made to work again, and this is probably responsible for putting me in my current position. When the first SONY portable digital short wave receiver appeared, I was smitten - I wanted one. Unfortunately, they were too expensive for me, and I had to wait.

A few years later, the SONY ICF-7600 series appeared. These were much smaller, and (fortunately for me) cheaper. By this time I was a 'Class B' radio amateur (did anyone ever work G6SUQ?), and at the Sandown Park VHF Convention a trader was selling a second-hand

ICF-7600. I bought it, and consequently spent more time listening to short wave than operating on 144MHz. I also discovered that my other interest (aircraft and aviation) was more than represented in the short wave frequency spectrum. Now, I could hear aircraft crossing vast distances, and I could still hear them after they disappeared from v.h.f. range. I could also hear aircraft coming in my direction, and knew when they were about to arrive.

I also found a lot of signals that I didn't understand. I could recognise Morse code (or 'c.w.' as people insisted on calling it), but there were other signals which confused me - what was this signal that sounded like 'rat-at-at-at-at', and what about the one that went 'squeeeeel, squeeeeel, squeeeeel'. Once I found that they were RTTY and FAX (respectively), I learnt to recognise them, and ignore them when I heard them. Now I have a receiver which can be controlled by computer, is extremely stable, and I sometimes spend an evening decoding RTTY press broadcasts and FAX pictures so that I can entertain my friends at work the following day.

Since I have been writing the 'SSB Utility Listening' column in *Short Wave Magazine* each month, I have received many logs from numerous people all over the world. One or two letters list stations that are considered to be 'pirate operations'. These are generally two-way communications, just like radio amateurs, but on frequencies allocated to other users. One of the busiest 'bands' for pirates is 6.6MHz, which is allocated for Aeronautical communications. For some reason, this is known as the 'Echo Charlie' band, and all communications are done in lower-sideband (l.s.b.). All aeronautical signals are upper-sideband, but the interference from the pirates renders most official communications useless.

## Frequencies

I must admit that this is where this article gets a bit biased. Although 'utilities' covers more than just voice signals, they are by far the easiest for the casual listener to understand. To make any sense of data signals you will need some extra equipment, but 'voice' utilities just need a pair of ears and a large dose of patience.

If you are new to 'utilities' the easiest voice signals to listen for

to listen to are those used by airliners crossing the North Atlantic. There are a series of lanes across the Atlantic, controlled by stations in the UK, Eire, Portugal, Canada and the USA. Once again, the frequencies, in no particular sequence:

2.872, 2.899, 2.962, 2.971, 3.016, 3.476, 4.675, 5.598, 5.616, 5.649, 6.622, 6.628, 8.825, 8.831, 8.864, 8.879, 8.891, 8.906, 11.279, 11.306, 11.309, 13.291, 13.306 & 17.946MHz.



The Sony ICF-SW7600 set Graham Tanner off on the listening trail.

are the VOLMET broadcasts. These are weather observations at various airports around the globe. They either transmit at set minutes past each hour, or they transmit continuously. I'm not going to explain fully about which stations transmit on which frequencies at what times, as that would take several pages. However, VOLMET broadcasts can be found on the following frequencies:

2.863, 2.881, 2.965, 3.001, 3.413, 3.458, 3.461, 3.485, 3.601, 4.663, 4.675, 4.715, 5.475, 5.499, 5.505, 5.561, 5.601, 5.673, 5.803, 6.603, 6.604, 6.666, 6.676, 6.679, 8.819, 8.828, 8.849, 8.938, 8.957, 10.051, 10.057, 10.090, 11.253, 11.369, 11.387, 13.261, 13.264, 13.270, 13.279, 13.282 & 13.352MHz.

Some of these broadcasts are very difficult to hear, and others are extremely loud and clear in the UK - but that is for you to investigate!

The next busiest frequencies

Similarly, there are networks of frequencies over most parts of the world, usually where long distances are flown over the sea or land where normal v.h.f. communications are almost non-existent. From the UK, the whole continent of Africa provides a very rich variety of signals and traffic. Try some of the following frequencies:

2.878, 3.419, 3.452, 3.467, 3.476, 5.493, 5.634, 5.652, 5.658, 6.535, 6.586, 6.673, 8.861, 8.879, 8.894, 8.903, 11.300, 13.273, 13.288, 13.294, 13.306, 13.357, 17.955, 17.961MHz

Some of these carry signals from countries that are very rare in the amateur bands.

The maritime frequencies can also be busy at times. A good place to start is the International Calling Channel of 2.182MHz. This has a brief period of silence on the hour and half-hour, but otherwise it is usually busy with ships of various sizes calling shore stations or other ships.

They usually QSY to another frequency, so listen carefully in case you miss the details of where they move to.

There are a number of other sections of the h.f. spectrum allocated to maritime transmissions. Maritime signals can be found in the 4, 6, 8, 12, 16, 18, 22 & 26MHz ranges. Most of these ranges have a 'calling channel' which is a good place to start when monitoring these bands. Also, these services operate in 'duplex' - that is, the ship and shore station both transmit on different frequencies but listen on each others transmit frequency. This takes quite some getting used to, as you usually only hear half the communications; for this reason, it is probably best to listen to the shore station, as they usually control the contact and request a QSY to another pair of frequencies.

There are many other very busy frequencies that are worth listening to, but this article must end somewhere. I could fill several pages with frequencies, and I have to draw the line somewhere; two frequencies which are worthy of a special mention are 4.742 and 11.175MHz - spend some time listening to these, and I'll promise you that you won't be disappointed.

## Logs

So now you are listening to signals coming from all over the world, what should do with what you hear? Make careful notes, that's what! This is known as Log-keeping, and provides you with a handy record of who, what and when you heard something. Over time, this can turn into a useful tool, as you may be able to detect when transmissions are likely to happen again. On the other hand, you may be lucky and hear some rare and distant signals; making notes about what you heard will help you remember 'the day you heard a rare one', or the day that you heard about something significant before it appears in the newspapers or on television.

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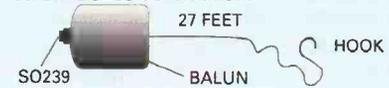
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### VECTRONICS AT-100

This is a superb self contained antenna system for inside the house/flat. (built in preselector).



**RRP £79.95** P&P £4

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#### NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS NEW PRODUCTS

### POLICE STYLE HOLSTER HHC-2

Matches all handhelds can be worn on the belt or attached to the quick release body holster.

**£19.95** P&P £1



### SP-350V

Be protected this summer! In-line lightning surge protector.

**INTRO PRICE**

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New miniature airband antenna + micro magmount. (5m coax with BNC fitted). Ideal for airband.

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Drake R8-E	Two pieces from	£599.95	FRG-9600	60-950MHz	£329.95	Sony SW-55	As new	£229.95
NRD-535	With ECSS unit	£1099.95	AR-2500	Wideband scanner (all mode)	£349.95	Sony SW-7600	As new	£129.95
NRD-525	VGC + spkr	£649.95	AR-950	Wideband scanner	£169.95	Sony SW-7600E	Immaculate	£139.95
R-5000	As new	£699.95	AR-2800	Wideband scanner (all mode)	£329.95	Sony SW-100E	As new	£149.95
IC-R71E	VGC	£599.95	SR-001	Scanner with remote control	£199.95	Panasonic RF-B65	As new	£129.95
HF-225	Immaculate	£399.95	PRO-2006	Desktop scanner	£229.95	Sony PRO-80	As new	£199.95
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FRT-7700	S.W. ATU	£59.95	PRO-2035	As new	£89.95	MVT-1000	As new	£269.95
FRG-7700	S.W. receiver	£299.95	PRO-2036	VGC	£199.95	HP-2000E	As new	£199.95
R-2000	As new	£399.95	IC-R7000	Base scanner	£749.95	PRO-26	As new	£249.95
MCL-1100	+ Mon + Meted upgrade	£299.95						

# What Is Utility Listening?

include in your log-keeping are the date and time of the transmission, and the exact frequency. Next in importance are the callsigns of the stations heard, and the transmission mode. All this information will help you should you need to find the stations again. If you decide to write to the station (or stations) asking for a QSL (see below), then you will need to include this information as proof of what you heard. Also, you should make some notes about the kind of communications heard - what were the stations talking about, and did they change to another frequency.

One of the things that radio amateurs do, is to send each other cards and mementos to confirm their contact. This is known as QSL'ing. It is also possible to QSL many utility stations, and usually the returned package contains some interesting information about the station, sometimes including stickers, patches, information sheets, and full details of the station and its equipment. The major problem with trying to QSL a utility station is finding the correct address to send to. If you hear an aircraft, you could write to the airlines HQ, if you heard a ship talking to another, how would you address your letter? These are the kind of problems that must be overcome before you are able to send a QSL.

## Patience

Listening to utility stations requires a vast amount of patience. Stations may only transmit on certain days, at certain times of day, or even change their operating schedules or frequencies without notice.

Other stations are transmitting almost continuously, or transmit at set minutes past each hour. To get any real success with utility stations, you will need to devote quite some time to listening. You will not be very successful if you just spend ten minutes listening, and then give up. It helps if you can leave your receiver tuned to certain frequencies, and then get on with some other task at your listening post - I usually read books, listen to my scanner, or

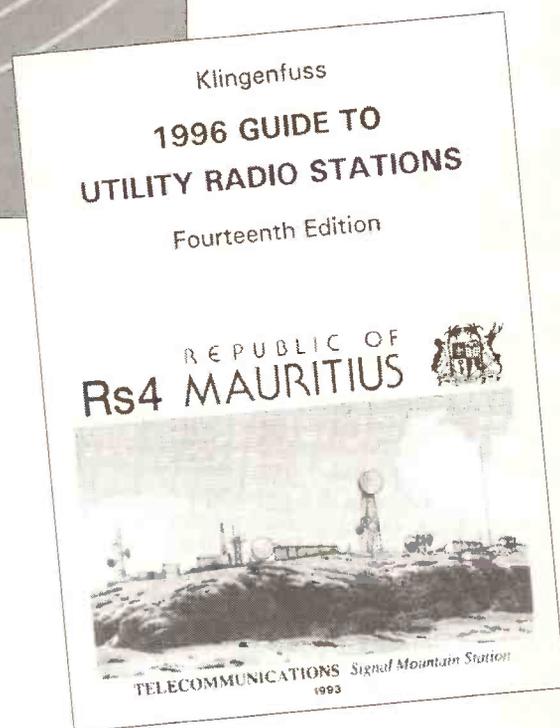
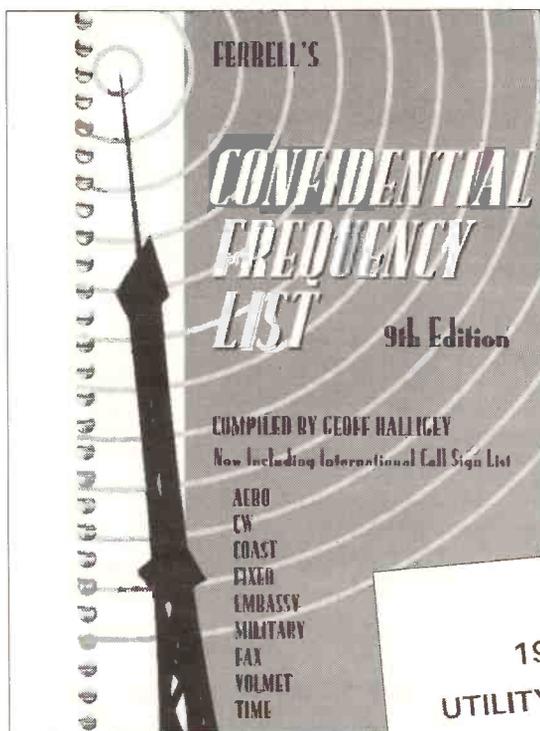
even do the ironing!

There are several books available which list stations and their operating frequencies (see below), but that is no guarantee to hearing the station. It is entirely possible to listen for the whole day, and not hear anything.

The subject of books is very emotive. Some books specialise in certain types of transmission, some books cater only for certain users (e.g. maritime, or aeronautical). Other books prefer to concentrate on data signals, and the various transmission schedules of stations. A third category lists the entire h.f. spectrum, with details of the stations and signal heard. The two books that seem to get the most mentions in surveys of frequency guides are the *Guide to Utility Stations* by Klingenfuss, and Ferrell's *Confidential Frequency List*. Both books have their good points and bad points, but serious 'Utility listeners' usually have copies of both books to hand when listening.

## Conclusion

Whatever your interests in radio communications, the h.f. spectrum has something to offer for everyone. Listening at different times of the day to different frequency ranges, you will be able to hear all sorts of utility signals from all around the world. Some of the signals will be routine reports, but every now and again you will hear some surprising signals. Next time you hear about some news-breaking event, just remember that a utility listener somewhere knows about it already because they heard all about it on short wave.



## Abbreviations

AMTOR	Amateur Telex Over Radio
a.m.	Amplitude modulation
b.f.o.	Beat frequency oscillator
c.w.	Carrier wave
h.f.	High frequency
ITU	International Telecommunications Union
l.s.b.	Lower sideband
NATO	North Atlantic Treaty Organisation
RTTY	Radio TeleType
SITOR	Simple Telex Over Radio
s.s.b.	Single sideband
u.h.f.	Ultra high frequency
u.s.b.	Upper sideband
v.h.f.	Very high frequency



# GMDSS

## Global Maritime Distress and Safety System

Sunday April 1912

### TITANTIC HITS ICEBERG - MANY LIVES LOST

This dramatic headline foreshadowed the modern era of Maritime Safety and Distress procedures.

From the initial CQD (SOS had not yet been officially introduced) at 0015 (*Titanic* time) till the last CQD was logged at 0217 the radio communications worked extremely well. Many ships had responded to the *Titanic's* calls and the whole disaster had been faithfully logged by a young s.w.l. in New York (some 1600km away). The listener in question was David Sarnoff later to become the founder and President of RCA.

The major problem was the lack of specified radio watch keeping and procedures to be adopted in the case of the receipt of a Distress Call. The first SOLAS (Safety of Life at Sea) Conference was held in London during 1913-14. Today's sophisticated GMDSS system can be directly related to the *Titanic* tragedy over 84 years ago.

Over the years a number of International Conferences have been held and the system that has been utilised up to the introduction of GMDSS was defined by the International Convention for the Safety of Life at Sea in 1974. This system extended the existing practices but still defined the communications equipment that had to be carried by the size of the vessel.

The new system, that will be fully implemented by 1999 defines the type of equipment that will be carried by the area in which the ship operates. The following classifications have been designated:

- Area A1 within range of shore-based v.h.f. stations
- Area A2 within range of shore-based h.f. coast stations (excluding A1 areas), in the order of 100 miles
- Area A3 within the coverage area of geostationary maritime communication satellites (excluding A1 and A2 areas) approximately between 70°N and 70°S
- Area A4 the remaining sea areas outside areas A1, A2 and A3.

It is specified that in all areas the continuous availability of alerting should be provided.

When the GMDSS is fully implemented listening watches on the various International Distress frequencies will no longer be

required, the initial Distress message will be sent via DSC (Digital Selective Calling) and/or by Satellite. (see Note 1)

The general requirements for the equipment carried by ships at sea is summarised as follows:  
• Every ship shall be provided with equipment capable of performing each of the functions as appropriate to the area of operation.  
• The ship shall carry at

*Jeff Harris*  
*G3LWM looks at a Maritime system which is both automating and revolutionising safety at sea.*

least two separate and independent radio systems to perform the alerting function.

• Items of equipment may perform more than one function

• The equipment must be simple to operate and where possible be designed for unattended operation.

• Survival Craft shall be fitted with equipment capable of performing on-scene communications by v.h.f. telephony.

• Survival Craft shall be fitted with a 9GHz SAR radar transponder.

Naturally shore based equipment and satellites have to be provide to complete the system.

The basic equipment that shall be carried by ships is shown in Table 1.

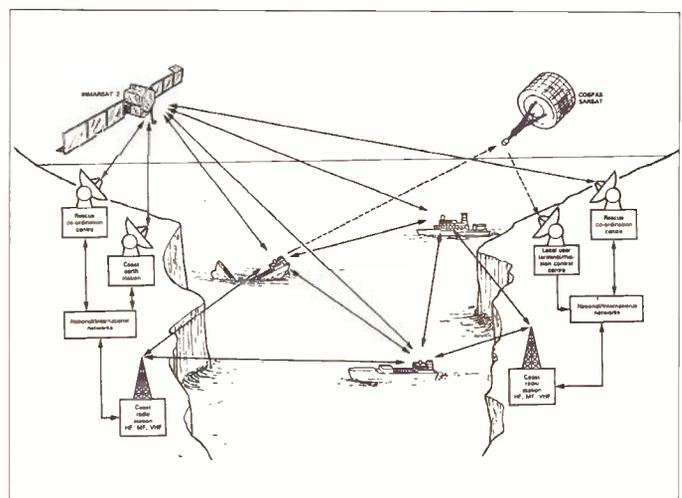


Fig. 1: General Concept of the Global System. Courtesy of IMO

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KENWOOD R-5000.....INC/VOICE BAND.....	£725
LOWE HF225.....SENSITIVE REC.G.COND.....	£349



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Mint condition!!  
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REALISTIC Pro 2005.....BASE.....	£160
REALISTIC PRO-2024.....BASE.....	£110
TRIDENT 2400.....	£215
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**EFW - Shortwave Antenna**  
20 meter s/w receive end fed wire antenna. Balun fed, uses high quality "Flex Weave" copper wire. 1-30MHz  
Price.....£59.95

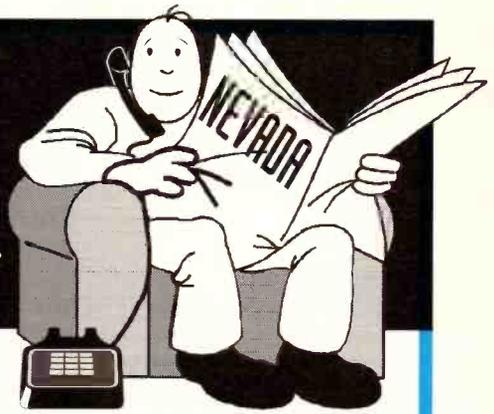
**DLB - Shortwave Balun**  
Matches end fed long wires to 50Ω coax, helps on rec. to reduce noise & interference. Transmits up to 100W. Fully moulded for full weather protection.  
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- 100 Memories
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- Variable pre-amp gives 20dB gain
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CTU8 - longwires & coax fed ant.....**£49.90**

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**Map defining the three sea areas as described in the text. Courtesy of MSA**

beacon detection is achieved by utilising the Doppler effect. Near Polar orbits results in world-wide coverage over a period of time. The 406 Beacons are more accurate and also contain encoded information to identify the user of the system. Because of the widespread use of 121.5MHz beacons these will continued to be utilised with the GMDSS, the more modern 406MHz beacons give better results, whilst the INMARSAT L-Band EPIRBs particularly as they give virtually instant (2 minutes) indication of the position of the casualty. The COSPAS system will often require two or more 'passes' to fix the correct position of the emergency beacon, the time can be over one hour, depending on which particular satellite is being used.

Earth Stations receive the signal from the COSPAS Satellites and pass the information to the relevant SAR services. For instance in the UK the Ground station at Lasham (Hants) receives Beacon Alerts and passes them to UK Mission Control centre (UKMCC) currently located at RCC (Rescue Co-ordination Centre) at Plymouth where they will be distributed to the MRCCs and RCCs for action. These MRCC/RCCs may of course be located outside the UK.

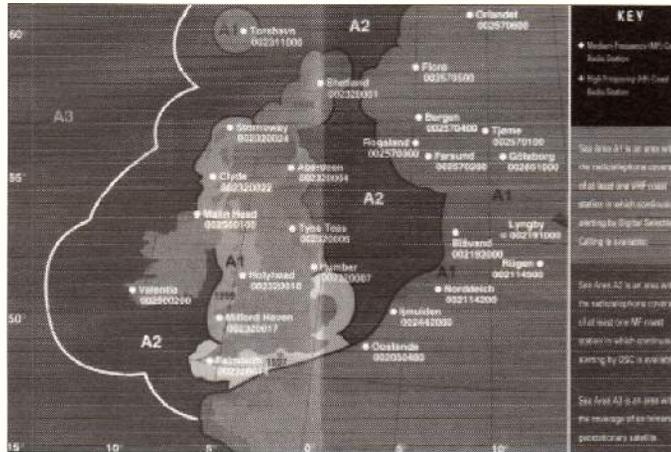
**Statistics**

121.5/406MHz Distress Beacons

Estimated numbers World wide (1995)

121.5MHz	600 000
406MHz	120 000

System Operation (not necessarily via Satellite) From September 1982 to June 1992 the COSPAS



System provided assistance in rescuing 2,781 persons in 981 SAR events

Aviation Distress	1,171 persons in 526 SAR events
Maritime Distress	1,466 persons in 411 SAR events
Land Distress	144 persons in 44 SAR events

The 406MHz system was used in 135 of these incidents (498 persons rescued) and the 121.5MHz system was used in all the other incidents. The current figures show a large increase in the use of 406 incidents.

Alerts the IMO instituted an in-depth investigation and actions to correct the situation are now being undertaken.

**DSC (Digital Selective Calling)**

For the owner of a cruising yacht or motor cruiser who sail in UK coastal waters it is reassuring to note that the Coast Guard has recently announced that HMCG will monitor Channel 16 "for the foreseeable future" (that, however, in politic speak could be tomorrow!!)

The amateur sailor need

however have no fears about the future use of DSC (apart maybe from the cost) in as much that it can be considered as an elaborate paging system capable of transmitting short messages.

In practice having transmitted a Distress Call on CH 70 v.h.f. by DSC (by pressing the Distress button on the radio) an acknowledgement from other ships or the Coast Guard on CH16 will be expected and the distress traffic will then proceed in the normal manner. The Coast Guard may acknowledge the DSC emergency by using DSC on CH 70. Vessels using DSC will be allocated a DSC Identification Number. This is known as the Maritime Mobile Service Identity. Once having received the MMSI number the Coast Guard can rapidly establish the type and details of the vessel involved in the emergency. Other information can also be transmitted with the DSC Distress Call such as the vessels position, etc.

The RYA (Royal Yachting Association under contract to the RA Radiocommunications Agency) who prepare the examination for the owners of pleasure craft and yachts wishing to use radio are already holding courses in the new syllabus. A new examination is expected to be in place within the next 12-18 months.

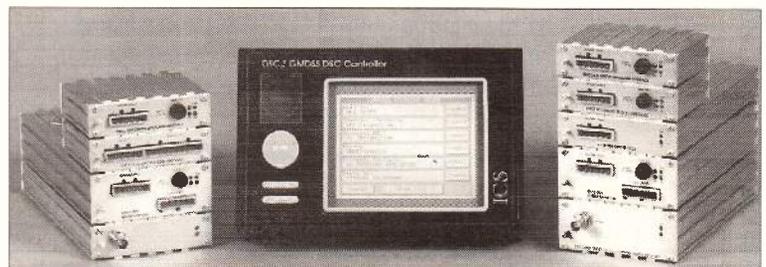
In conclusion no better summing up can be achieved than by quoting the words of Jim Houston (District Staff Officer GMDSS at HMCG Falmouth) "The full implementation of GMDSS on 1 February 1999 will have



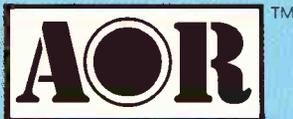
**A fixed combined v.h.f. DSC radio. Courtesy of SIMRAD Shipmate AS**

**False Alerts**

Since the adoption in 1992 by IMO (International Maritime Organisation) of GMDSS the number of False Alerts has steadily risen reaching a peak in 1994 of 864. This must be viewed against the figure of 903 alerts in which a distress situation existed. These figures are also only those received from the HM Coast Guard at MRCC Falmouth. Faced with a world-wide escalation of False



**A modular system solution from ICS. Shown straddling the controller on the left is a v.h.f. solution, on the right an h.f. package. Courtesy of ICS Electronics Ltd.**



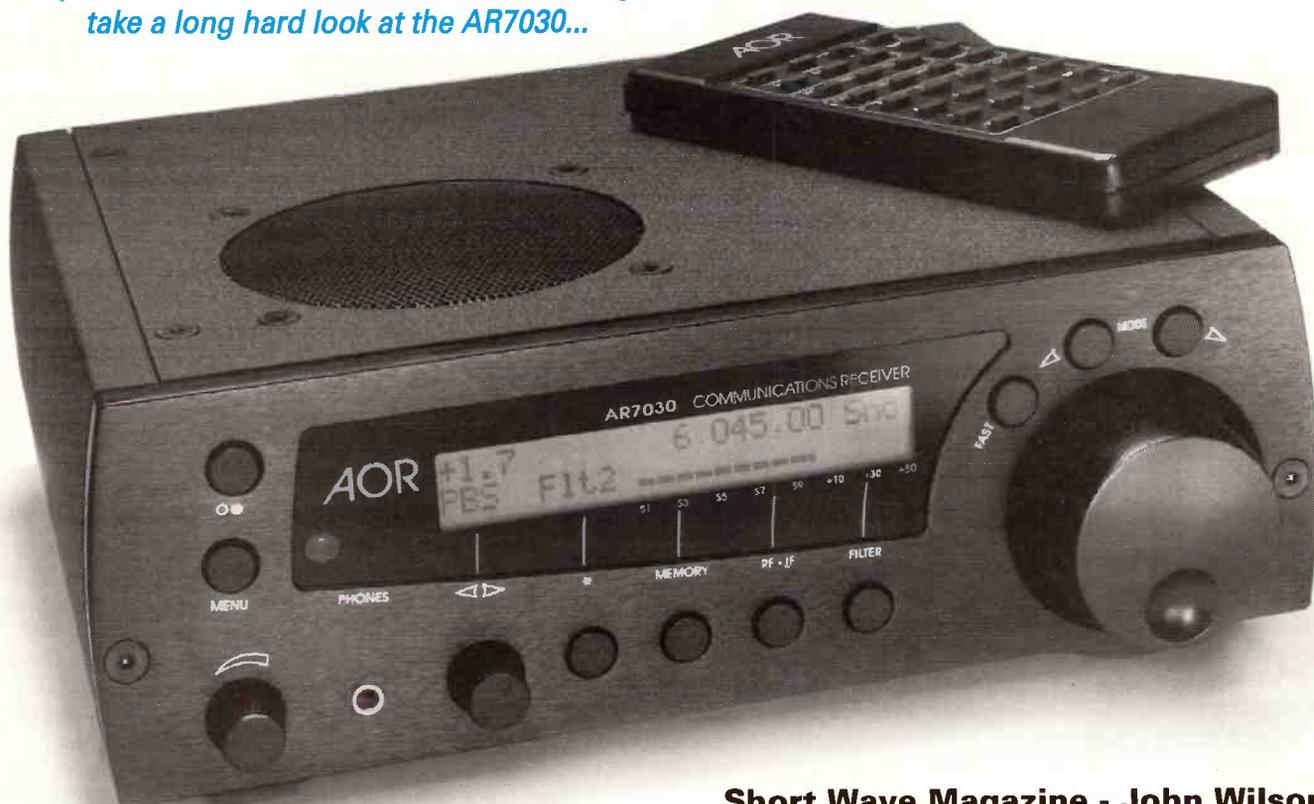
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*If you are serious about short wave listening,  
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## AOR AR7030 - High dynamic range short wave receiver

Reviews around the world are still appearing and independent performance measurements confirm the high specification and excellent performance including IP<sup>3</sup> of +30dBm.

If you are still not convinced, contact your local dealer and find out 'first hand' what all the excitement is about. A colour leaflet is now available along with full technical specification including filter plots etc.

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### Short Wave Magazine - John Wilson

*"JT has wiped the slate clean on receivers as we know them and has rendered virtually everything else obsolete"*

*"...the appearance is stunning, the finish on every part is of the highest standard..."*

*"If you can't get sensible audio out of even a rotten signal with the AR7030 then nothing will do it"*

*"...there is a very good synchronous a.m. system which has the unique feature of being auto tuned"*

*"...I was simply amazed when I came to explore the i.f. filtering arrangements..."*

### RSGB RadCom - Peter Hart

*"The excellent RF performance of the AR7030 is certainly most apparent in on-air tests. The receiver gives very clean results under all conditions and there is no sign of overload in demanding strong signal situations".*

*"The intermodulation measurements are at the limit of my measurement capability and the close-in result by far the best I have ever measured on any general coverage receiver".*

*"I was particularly impressed with the VLF performance".*

*"The AGC characteristic is ideal and I really cannot fault any of the functions of the radio".*

*"It is really packed with features and has a superb technical performance".*

## AR7030 options

The AR7030 is extremely compact, the internal cabinet space is considered to be in three sections. Generally speaking each option (except for filters fitted directly to the main PCB) takes one space, the battery however takes two spaces. With this in mind it is theoretically possible to fit the crystal daughter board, notch/noise blanker PCB and WFM option all at the same time... but then there is no room for the internal battery. If the battery option is fitted then only one other option may be fitted in addition. Operation will usually fall into categories of "High Performance" or "Portability" so this should not cause too much of a problem.

There is no fitting charge for options if ordered with a new AR7030 receiver. Postal charges apply to the options when ordered separately. Prices include VAT @ 17.5%.

**AR7030** receiver. 0 - 32MHz all mode (AM, Sync AM, NFM, USB, LSB, CW, Data) DDS high dynamic range short wave receiver. Fitted with 2.2, 5.5, 7.0 & 10 kHz I.F. filters as standard. 100 memory channels, pass band shift etc. Supplied with infrared hand control, a.c. power supply and comprehensive operating manual. **£799.00**  
*Delivery around 10 days from placement of order.*

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**CFJ455K8** 1.0 kHz Murata ceramic data filter **£39.99** *In stock*

**XTAL2.4** 2.4 kHz high quality 8 pole crystal filter (daughter board recommended for fitting) **£129.99** *In stock*

**Collins-SSB** 2.5 kHz mechanical SSB filter **£89.29** *In stock*

**CFK455J** 3.0 kHz Murata ceramic very narrow AM / SSB filter **£29.99** *In stock*

**Collins-4A** 4.0 kHz mechanical narrow AM filter **£89.29** *In stock*

**CFK455I** 4.0 kHz Murata ceramic narrow AM filter **£29.99**  
*Expected autumn*

**Collins-6A** 6.0 kHz mechanical AM filter **£89.29** *In stock*

**FL124** Daughter board for fitting crystal filters. Comprises a bracket and PCB designed to take up to 3 crystal filters. Patterned to accept Hy-Q, Kenwood & JRC etc. Supplied with connectors and cables to fit two filters as standard (using the optional Collins positions of the AR7030 PCB), capacitors and fitting sheet. Strongly recommended if fitting crystal filters to the AR7030. **£24.99** *In stock*

**BP123** Internally mounted sealed lead-acid battery, mounting kit & charging inverter PCB. Will accept charge from the standard power supply or from any external DC supply of 9 - 15V @ 2.0A. Achieves 70% fast charge in 2 hours and will provide 4+ hours of operation. Note: "Slight" performance fall off by a few dB when running from the internal 12V battery and coverage above 30MHz is not guaranteed. **£99.99**  
*Due September '96*

**TW7030** Optional telescopic whip for the AR7030 when operating portable from a table top. Terminated in a PL259 plug (whip amplifier already fitted inside the standard AR7030 receiver). **T.B.A.**

**SC7030** Soft carry case for transportable operation. **T.B.A.**

**Notch/Noise banker** PCB currently under development. **T.B.A.**

**WFM Band-II** Stereo internal converter with RDS display - *still under consideration and dependent upon demand.* **T.B.A.**

**Features CPU** Enhanced microprocessor with added features such as alpha-tag memory channels etc. **T.B.A.**

**PC-software** Windows based software package for control of the AR7030/3030 receivers. Logbook, data base, Max/Minimum Usable Frequency maps etc. **T.B.A.**

## Collins KWM-2, 75S & 32S

Operators of the above models  
*watch this space!!! More next month...*

## Tip of the month - Audio mute on the AR7030

There have been a few phone calls and e-mails asking why there isn't an audio mute button fitted to the AR7030 infrared hand controller. Quite simply, the receiver's operating system is "so flexible" that one is not required... with careful creative thinking!

The receiver is equipped with **TWO VFOs, each is capable of holding independent volume level.** Audio "mute" can therefore be easily and quickly set up from the hand controller. While the AR7030 is switched On and in normal use, press the infrared button **[VFO A/B]** to select the alternate VFO, if the background VFO isn't in use then the current frequency is written to it. Next turn the volume to zero using the **[Volume -]** key of the infrared controller (or use the receiver's front panel volume control). Press the **[VFO A/B]** key to restore normal listening and when you wish to mute the audio press the **[VFO A/B]** button.

*Happy listening...*

## Short Wave Column - Bob Ellis's Utilities Greatest Hits

Take a deep breath then try for the classic clock on 60KHz, MSF Rugby; the weather on 117.4KHz from Mainflingen and the news on 139; embedded data on 198KHz, BBC Radio 4LW switches a million Economy 7 installations; non-directional beacons around the coast on 284.5, 287.3 and 356.5KHz; slow Morse on 484KHz from The Humber and Calling on 500; all at sea on 518KHz for NAVTEX and Calling on 2.182MHz with 2.381 for Commercial Traffic Watch; 2.638MHz for Inter-ship Safety and navigation warnings on 2.670, Land's End Radio; 2.702 for Coastal Control; searching in the dark on 3.023; this Royal Navy FAX sender, nicely embedded in Eighty on 3.652MHz; go for 4.125 Marine Calling/Distress if it goes wrong; Portishead calling CW on 4.274 and 4.286; 4.340 for NATO Distress; 4.384 for Portishead Radio voice; weather on 4.489, Bracknell Met Service in RTTY with 4.489; the RAF on 4.707, 4.710 and the weather on 4.715, keeping watch on 4.742MHz; control the East Coast on 5.080 and 5.113.5; for that Alaskan emergency; weather on 5.505; air traffic control on 5.529, 5.532, 5.598, 5.616, 5.649, rescue on 5.680, more planes on 6.604 and 6.622, marine distress on 8.291; 8.331 for fax from Royal Navy Northwood; 8.634 for Ships Survival Craft; 8.764 for Portishead Radio and 8.764 for the US National Weather Service, in fact the whole range of Utilities can be heard in this sub-band up to 9.032 for RAF Flight Watch; then 9.251, "The Lincolnshire Poacher", classic "English" number station; New York weather on 10.051; so much stuff around 11MHz including the USAF on 11.141, 11.175 and 11.179 with our boys on 11.204 and the classic 11.234; news on 12.212 RTTY from Tanjung Press Agency, Belgrade and China on 12.228; 12.392 for Marine World-wide Calling and Distress and just so much at 13MHz, including 13.146 for Portishead Radio; 13.205 for Berne; 13.227 for NASA Launch Support; 13.270 for Gander; long distance Ops on 13.327, 13.330, 13.333, 13.336, 13.339 and 13.342; then 15.035 for St Johns Airforce Base, Canada; last but not least, a rash of long distance working when conditions allow on 17.916, 17.919, 17.922, 17.925, 17.928, 17.931, 17.934, 17.937 and 17.940.

That lot should keep you listening for now while I phone the Guinness Book of Records for the longest sentence ever to appear in an advert...

© Bob Ellis



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# GMDSS

the greatest effect on Maritime Search and Rescue since Marconi developed Radio!"

## The Equipment

The development of Electronic systems and great improvement in their reliability coupled with increasing integration of all types of circuitry has enabled the GMDSS system to become a workable reality within a relatively short time.

## VHF Radio with Voice and DSC (Digital Selective Calling)

This will be a v.h.f. Marine Band f.m. radio with the addition of an LCD Display to show the DSC Incoming and Outgoing information. Many versions of this type of equipment already exist. In the majority of installations in commercial vessels the DSC system will be coupled to the electronic navigation system used within the vessel so that the vessels position will be automatically transmitted if a Distress call is initiated. A Distress button will be incorporated so that Distress Calls can be sent with the minimum of operator involvement. The Internationally agreed channel for DSC is v.h.f. (Marine Band) Channel 70 - 156.525MHz. The DSC Receiver is a separate receiver within the main unit. Apart from the DSC functions the v.h.f. radio will perform the same functions as previous generations of v.h.f. Marine radios offering inter ship communication, communication with Coast Guard and other Maritime Rescue organisations and Link Calls to the PSTN via Coast Stations.

HF Radio with Voice, DSC and NBDP (Narrow Band Direct Printing)

A typical h.f. marine installation would consist of

the following units. The equipment detailed here is taken from the specification of JRC (Japan Radio Co.) and is typical of the GMDSS requirements:

## HF Transmitter 800 or 400W PEP

Frequency Range 1.6 to 27.5MHz. Frequency tolerance within 10Hz. Built-in two-tone alarm generator for existing distress alarm system (2.182MHz) Built-in battery charger. All-band receiver 90kHz - 30MHz DSC h.f. Watch Receiver Continuous scanning on the International DSC Frequencies of 2.1875MHz and 8.4145MHz and other designated DSC h.f. frequencies. Other equipment would include DSC with Modem, NBDP with Modem, Automatic a.t.u., Remote Controller, Data Terminal and Printers.

## NAVTEX Receiver

Provides Automatic reception of all Maritime Safety Information in areas where NAVTEX transmission is available on 518kHz.

## INMARSAT Ship Earth Station

Provides global communications via INMARSAT Satellites.

Distress Alert and general communications on telephone and TELEX channels. In addition reception of SAFETY NET (Messages relating to Maritime Safety) and FLEET NET (Commercial Messages) External antenna will guarantee correct orientation within wide limits, typically roll:  $\pm 33^\circ$  and Pitch:  $\pm 13^\circ$ .

## EPIRB Emergency Position Indicating Radio Beacon 406.025MHz

Designed to Float-free if vessel sinks. Automatically transmits position to the COSPAS SARSAT System (within 2-5km) Can also be fitted with Homing Transmitter on 121.5 and/or 243MHz or DSC v.h.f. Channel 70

## VHF EPIRB

The original frequency EPIRB on 121.5MHz is also received by the COSPAS system but results in less accuracy of the position of the casualty. This type of EPIRB is only used in area A1.



Pic 4 Two typical GMDSS v.h.f. hand-helds from Navico. Courtesy of Navico Ltd.

## 9GHz SART Survival Craft Radar Transponder

Generates a series of specified responses when interrogated by normal 9GHz shipborne or airborne Radar. No modifications are required to the ships radar equipment.

## VHF Portable Radios

Reliable v.h.f. Radios to communicate with the rescue services on scene.

### Further Reading:

*The Maritime Radio & Satellite Communications Manual*  
by Ian Waugh (G0WIZ) ISBN: 1 85310 471 X  
Publisher: Waterline Books, Airlife Publishing Ltd,  
101 Longden Rd, Shrewsbury, Salop.

*Global Maritime Distress and Safety System*  
by the International Maritime Organisation ISBN: 92  
801 1216 3  
Publisher: IMO, 4 Albert Embankment,  
London SE1 7SR

*Leaflet GMDSS Radio for the Next Century*  
(Free of Charge)  
Maritime Safety Agency, Spring Place, 105  
Commercial Road, Southampton SO15 1EG

*Handbook for Marine Radio Communications*  
Publisher: LLP Ltd., Sheepen Place, Colchester,  
Essex CO3 3LP. Tel: (01255) 772113.

*Admiralty Book of Signals Volume 5 (1996/97)*  
*Global Maritime Distress and Safety System*  
Publisher: Hydrographer of the Navy, UK  
Hydrographic Office, Admiralty Way, Taunton,  
Somerset TA1 3DN. Tel: (01823) 337900

The Royal Yachting Association offers a number of useful publications:  
RYA, House, Romsey Road, Eastleigh,  
Hants SO5 4YA  
Tel: (01073) 629962



# When I Win The Lottery...

**W**hen the Editor asked me to put together my dream decoding station I initially thought - no problem. But it's actually quite hard when you have to commit to just one of each of the components that go to make a complete station. If I really won't I'm sure I would actually have at least a couple of receivers around just in case one needed repair! Anyway, enough frivolity, let's get down to business.

Rather than have a completely open choice on my dream station, I've agreed a few ground rules just to make sure the selection is realistic. Although money is no object, I've restricted my choice to equipment that's readily available on the amateur market. I've also selected a station designed to satisfy my personal listening interests.

## Antenna Choice

As the rather over used saying goes - garbage in, garbage out. This is very true of antenna systems and no matter how good the receiver is, it will always be limited by the quality of the signal from the antenna. As I live in a fairly normal house, I don't have

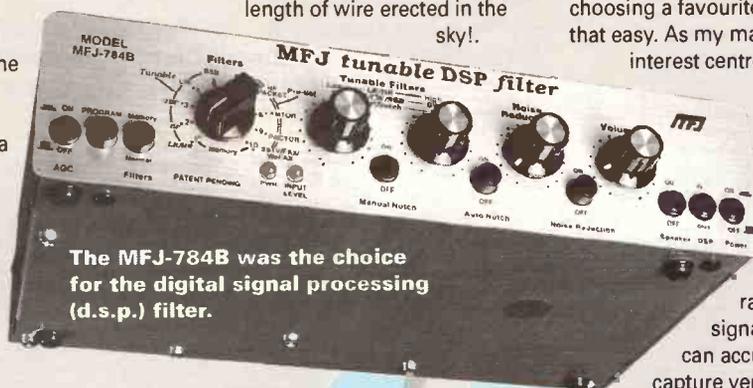
room for an antenna farm of switchable rhombic systems erected on 60m masts! As a result, I will have to compromise with a more restrictive antenna. Whilst a random length wire is by far the most popular antenna system with listeners, it's very

prone to noise pick-up and is difficult to properly match to a coaxial feeder.

If, like me, you're likely to be using a computer in the shack, a coaxial feeder is essential to minimise

the risk of noise pick-up. So for this project I decided to look at a few other options. Whilst active antennas appear very neat, they can't really compete with the signal capture from a decent length of wire erected in the sky!

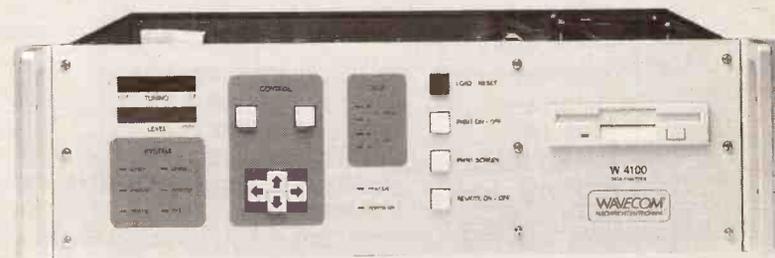
*What would you do with that Lottery win? If you're well into short wave listening a new station would be high on the list, but what would you actually buy with so many systems to choose from? Mike Richards, our 'Decode' columnist describes his dream station.*



**The MFJ-784B was the choice for the digital signal processing (d.s.p.) filter.**

There are also all manner of potential problems from overload of the electronics in the active antenna itself. After searching through a few books, I came across the T2FD antenna design.

This is basically a sloping folded dipole that's terminated with a 500Ω resistor at the centre



of one span and the feed point connected to the same point on the other span. The impedance at the feed point is 500Ω so a 10:1 balun is required to achieve a good match to a 50Ω coaxial feeder. The most important characteristics of the T2FD are good noise rejection, flat frequency response and its omnidirectional properties. It is also quite compact and a 15m length will give a useful performance from 3 to 30MHz. Even if I don't win the Lottery, I might just give one of these antennas a try.

## Receiver

There are so many good receivers on the market that choosing a favourite is really not that easy. As my main listening interest centres on the data modes, I need a particularly good receiver to handle the varying demands of a wide range of data signals. So that I can accurately capture very narrow shift signals such as f.d.m.

(frequency division multiplex) telegraph, the receiver will need to tune in frequency steps of 10Hz or less. Once tuned-in the frequency stability needs to be extremely good. This is because monitoring the more elusive stations requires the receiver to

**Although the Wavecom 4100 is an excellent decoder, Mike decided that the Hoka Code-30 would be his preference.**

be left tuned to the signal for many hours at a time waiting for that vital message that will confirm the station's identity. In practical terms this means the receiver will need top flight frequency stability to stay within 20Hz of the set frequency for several hours. This is a very stringent requirement that will generally only be met by receivers that use temperature compensated reference oscillators.

Successful decoding of data signals on today's busy and noisy h.f. bands requires a good selection of very high quality i.f. filters. Whilst FAX signals demand a wide passband with very low phase distortion to preserve the fine detail of the chart, extracting a weak c.w. signal from the noise requires very narrow filtering. The chosen receiver will also need to have a healthy fixed level audio output for the decoding system and facilities for computer control of most of its functions.

So what's it to be? There are few receivers around that can match these demands and I narrowed my choice down to the following: Watkins & Johnson HF-1000, NRD-535 and the AOR AR7030. The HF-1000 is a very impressive receiver with a host of

advanced features. However, it is very big and I wasn't over impressed with the audio quality of the model I reviewed some time ago. This may well have been fixed by now, but it's still a big beast.

Next in-line was the NRD-535. This is a great receiver with a very famous pedigree, but I wanted more. The final contender was the AOR AR7030. Now this really is attractive. Although I've yet to have more than a brief play with one, it has been very comprehensively reviewed, tested and re-tested more than most. Those far more qualified than me have given it strong support and what's more, it's a British design! It looks good, is compact and does the business. In fact, from a utility point of view it has it all - frequency steps of just 1.4Hz, stability of 1p.p.m. and the facility to operate with six internal filter options. As to computer control, the AR7030 adds a new dimension here as the whole receiver is 'fly-by-wire', so giving the potential for extremely comprehensive computer control.

### External Filters

Although my main listening interest is clearly the data modes, I also enjoy most other areas of listening from amateur radio through to broadcast stations. Because of this, I wanted to enhance the station with some external audio filtering. In my current set-up I use a trusty Datong FL3, but for the dream station, I want to include one of the new digital signal processing filters.

These units include all the features of conventional analogue filters, plus a few very

special extras that cannot be achieved in analogue designs. A good example is the de-noiser that most feature. In this application the d.s.p. processor analyses the incoming signal and passes coherent signals such as speech, whilst rejecting the rest. When properly implemented, this can provide a good 10-15dB reduction in the background noise level. Another powerful feature is the multi-tone tracking notch filter. As the name suggests, the filter can remove around six interfering tones from the audio signal completely automatically. The choice of a d.s.p. filter is not easy as new models are appearing all the time. From personal experience, my two favourites are the JPS NIR-12 and the MFJ-784B. Both units have a de-noiser and feature an easy to use variable bandwidth bandpass filter arrangement. In the end the MFJ-784B gets my vote due to its excellent all round performance and the simple way in which custom filter settings can be stored.

### Decoder

With all the basics chosen, the final step is to select a top-of-the-range data decoding system. As a relatively experienced data monitor, I need a system that can handle as many modes as



**The Watkins & Johnson HF-1000 came second in the dream receiver race.**

possible, but I also need the best analytical tools. Perhaps I need to explain my self at this point. Once you've passed the initial stages of utility listening and get fed-up with listening to Iranian

can start to build a picture of the station's activity and find other signals with the same fingerprint on other parts of the h.f. band. It's surprising what you can discover with some patience and

a good decoder. A look through the systems available reveals just two main units in contention, the Wavecom 4100 and the Hoka Code-30. There are a lot of similarities between the two units in terms of modes and features, but they are physically very different. Whereas the Wavecom is a self-contained 19in free standing unit, the Code-30

### Summary

So what have I ended-up with? The T2FD antenna has got to be worth a try and I'm going to build one anyway! The AOR AR7030 has the facilities and performance necessary for top level decoding and looks good as well! I've always liked the flexibility that comes from an external audio filter and the MFJ-784B certainly impressed me when I had it for review. And finally, the Hoka Code 30 decoder. This is strictly not for beginners, but is generally regarded as the ultimate by most data enthusiasts. It has the additional advantage of being very compact as all the electronic fits within the PC.

Putting this station together has been a real delight - I've even bought an extra line for next week's Lottery, just in case!

propaganda or noisy FAX charts, many listeners get great enjoyment from trying to identify the many whir's and warbles that can be found throughout the h.f. bands. This type of monitoring requires lots of detective work as many of the stations don't

publicise their activities and send very little in the way of plain text messages. So the only way to identify the station is from its signal characteristics.

It's at this point that the analytical tools of the decoding system come into their own. By making detailed measurements of the signal characteristics it's possible to form a radio fingerprint of the station. Even if you don't know the identity you

hardware resides on a standard PC expansion board that is located within the PC.

I was initially very attracted to the Wavecom as I used one for several weeks whilst reviewing it for the May '95 SWM review. The performance was extremely good and, being a free standing unit, it didn't require a PC. However, like the HF-1000 receiver, the 4100 is a large 19in rack mounted unit. Although I've yet to get my hands on a Hoka Code-30 for review, several 'Decode' readers use the Code-30 and report very impressive results. The range of modes available is extremely comprehensive and the analysis modes are probably the best available. So my final choice is the Code-30 - with all the options, of course!



**Mike chose the new AOR AR7030 receiver as it offers everything that the decoder needs.**



# The ICOM IC-R8500 Receiver

*Having said in the past that he preferred equipment which stopped at 30MHz, John Wilson was placed in a difficult position when asked to review the new IC-R8500 receiver - with a frequency range extending from 100kHz to 2GHz! Could he refuse? Of course he couldn't!*



Unpacking the R8500 and setting it on my desk revealed that this is a receiver which looks like a receiver in the classic style, with the major operating functions laid out conventionally and conveniently on a panel measuring 287mm wide by 112mm high. For Imperialists like me that's about 11.5 by 4.5 in, and the receiver is about 12.25in deep from front to back. It weighs in at 7kg or 15.4lbs, which gives some idea of its solidity, because that weight does not include a mains power supply, the receiver being powered from an external 12Vd.c. (nominal) source. Taking off the covers reveals where the weight is situated, and it was a pleasure to discover that the whole receiver is built on and inside a die casting of some complexity. The casting not only includes individually shaped compartments for each section but also continues right around the receiver. Lord alone knows how much money the tooling cost for this, but what a perfect way to construct high performance r.f. equipment!

## Very Attractive

The overall styling is new to ICOM, with the previous sharp edged look being replaced by a softer, more rounded appearance very suggestive of the JRC NRD-535 but retaining the familiar ICOM excellent build quality and finish. What colour is it? I'm not sure, because in some lighting it looks black, but I'll settle for a dark charcoal grey - whatever it

is, it's very attractive and workmanlike.

The control layout is very logical and each control is clearly labelled with its function. I'm sure I don't have to describe the layout for you because it is clear from the photographs, but I'll make a few observations as they occur to me. The tuning knob is a delight to use, being just the right size and weight (90g.) to spin easily and whiz through the frequencies. When tuning slowly, the soft rubber outer grip feels perfect, but what a nice touch to find that the recessed finger hole rotates on its own shaft, so you don't wear out your fingertip when using it. Small details like this make a big impact on the 'feel' of a receiver, so my compliments go to the designers. Incidentally, not only is the tuning knob a good weight, that weight is distributed around the outer edge of the knob which gives a better 'flywheel' effect. OK. so you don't like freely spinning controls, so ICOM have provided a variable drag brake adjusted by a little screw adjacent to the tuning knob - another small but significant design detail.

I'm a man who likes his modes well defined, and I was pleased to see a row of individually labelled mode selector buttons for 'WFM' (broadcast or TV f.m.), 'FM' (communications channels), 'AM' (obvious) and 'SSB/CW'. Selection between modes is therefore a matter of pushing the appropriate button, but three of the modes have further selections made by repeated presses of the same

button. 'FM' toggles between wide and narrow selectivity bandwidths of 12kHz and 5.5kHz thereby accommodating most used communications f.m. deviation standards. 'AM' has three steps: Narrow (2.2kHz), normal (5.5kHz) and wide (12kHz), whilst the s.s.b. button has four steps cycling u.s.b., l.s.b., c.w., c.w.(narrow) and back to u.s.b. again. I would have preferred not to have this one way 'carousel' arrangement because it means you have to press the s.s.b. button four times to change from l.s.b. to u.s.b., but I can understand the designer's dilemma in not wanting to have a separate additional row of buttons for bandwidth selection. I was amused to read on page 13 of the operating manual that s.s.b. is used for: 'Short wave broadcasting, amateur bands, etc. Use u.s.b. for normal s.s.b. reception; l.s.b. is not normally used'. So what about it you chaps on 80 metres? ICOM say that you are all on the wrong sideband! It's only fair to say that virtually all commercial s.s.b. traffic is carried on u.s.b., whatever the operating frequency, so the handbook is not completely incorrect.

I am of course considering the R8500 so far as an h.f. receiver because I found it so good on these frequencies, but I haven't forgotten the stretch from 30MHz to 2.000GHz which, combined with the memory and scan facilities, makes the receiver so different and powerful. I will go into this further, but for now, back to the controls.

Below the mode select buttons is another row

selecting 'NB/AFC', 'AGC' and two attenuator settings. When in f.m. modes the 'NB/AFC' button activates an automatic frequency control system which tracks an incoming signal and keeps it in the middle of the f.m. discriminator passband. Two left/right arrows are provided in the main display to show if the signal has drifted, but in practice the R8500 tracks so well that the arrows only appear if you deliberately off-tune the receiver. The actual a.f.c. tracking range is not specified in the handbook so I tried to determine how far a signal had to drift in order to fall outside the tuning range of the a.f.c. system. I gave up when I reached  $\pm 100$ kHz in narrow f.m. and over 200kHz in wide f.m.. For a signal which is steadily drifting, the a.f.c. tracking is remarkable, but of course if a signal suddenly pops up 10 or 20kHz away from the receiver frequency, the a.f.c. ignores it - as it should. The only observation I would make is that in wide f.m. with a large frequency drift, the a.f.c. sometimes stops retuning a few kilohertz short of the original frequency. In practice this does not matter at all since a wide f.m. signal has by its nature some latitude in the need for exact tuning, provided that the discriminator response is linear - and in the R8500 it certainly is linear.

In all other modes the 'NB/AFC' button brings in an impulse type noise blanker which again worked well on 'clicky' noises such as my son's unsuppressed 25 year old Land Rover (useful test, that). Funny how noise blankers have

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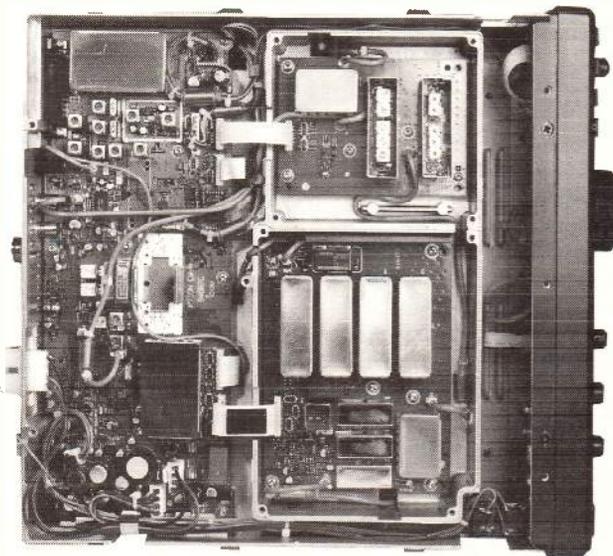
changed from the days of the Russian 'Woodpecker' over the horizon radar system. The only woodpeckers I can hear are real ones in the woods around me.....but I digress.

## Attention To Detail

The a.g.c. button switches between 'fast' and 'slow' settings, with the appropriate legend on the main display. Both decay time constants are correctly chosen and work well for s.s.b., c.w. and a.m. signals. Although the exact time constants are not quoted in the handbook it is clear that there is more to the a.g.c. system than one is told, because when a signal stops, the a.g.c. decays slowly to about S3 on the signal strength meter and then accelerates quite quickly to restore full receiver gain. In use, this means that s.s.b. speech keeps the gain constant at levels over S3 but on cessation of speech the gain is restored quickly, which helps greatly when listening to, say, a strong aircraft signal followed by a weaker ground station response. I don't have a circuit for the R8500 so I don't know how this has been achieved, but it shows careful design on someone's part - more attention to detail.

Two r.f. attenuator buttons select 10 and 20dB steps, and if both buttons are depressed the attenuation is 30dB. With my antennas here I didn't need the 30dB attenuation at all, but then again I'm out in the country and not sitting underneath the towers at Droitwich or Rugby, so the 30dB may be of use in certain locations. The attenuation in use is shown on the main display panel

Underneath again are three rotary controls for 'AF Gain', 'Squelch', and a dual control for 'IF Shift' and 'APF'. 'AF Gain' is obvious, but the squelch control is in fact operating in two different ways. In the f.m. modes the squelch is a classic noise operated system, but for all other modes the squelch control sets a level on the a.g.c. 'pedestal' below which signals are suppressed. The



actual level is shown on the signal strength meter and this is a very accurate method of determining which signals will be heard. Setting the level to, say, S-3 on the meter ensures that any noisy signals will be rejected, leaving only those strong enough to provide easy listening when using the scanning facilities.

## Audio Peak Filter

The 'APF' (Audio Peak Filter) control proves to be very useful in real listening conditions and consists of a bandpass filter which can be tuned across the audio spectrum of an incoming signal. Two bandwidths are provided, the wider one being available on all modes including wide f.m., whilst the narrow filter can only be engaged in s.s.b., c.w. and a.m. modes - quite a reasonable choice since one is hardly likely to need narrow filtering on f.m. signals. The filter tuning range is from approximately 500Hz to 5kHz and its effect is remarkable on the h.f. bands. Selection of the APF function is by a push button adjacent to the main tuning knob and if the button is held for a second the filter toggles between 'wide' and 'narrow'. The setting you choose is retained in memory when you switch off the receiver.

For an h.f. receiver the provision of 'IF Shift' is almost essential, and the R8500 provides the facility on s.s.b.

and c.w. modes. The shift range is quoted as more than  $\pm 1.2$ kHz and on the review receiver it actually measured at +1.5 and -2kHz. The slight unbalance was of no practical consequence, but for those who want perfect u.s.b./l.s.b. tonal balance (and it's remarkably difficult to achieve), the demodulating carrier oscillator frequency (b.f.o.) can be adjusted individually in u.s.b., l.s.b. and c.w. modes by simply holding down the s.s.b./c.w. mode button for one second which activates a sub display showing the actual b.f.o. offset. The amount of offset can then be adjusted by use of the (M-CH) knob to suit your own preference and the settings are then retained by the receiver. This kind of provision allows a user to tailor the receiver to their own particular requirements - for example a keen RTTY or data enthusiast can arrange to have a unique b.f.o. offset for the tone spacings they wish to use. Well done ICOM - can I say 'another example of attention to small details'.

That more or less covers the left hand section of the front panel except to observe that in addition to the headphone jack, ICOM have provided a fixed level audio output for tape recorder use, together with a socket for remote switching a tape recorder when the squelch control opens. The thing I'm so pleased about is that these are on the front, rather than the rear panel, and

thus become very convenient to use. How many times have I fiddled around the back of a receiver trying to find the remote control connector??

## Tuning Rates Are Crucial

Now - how does one tune the R8500? With a tuning knob, dear Henry, dear Henry - but there is more to it than that. In a receiver covering such a wide frequency range as the R8500, the tuning rates are crucial to being able to use it to its fullest advantage. For broadcast f.m. or TV signal chasing, you really need to get along at high speed, whilst winking out s.s.b. programme feeds from the Andaman Islands requires slooooooow tuning. The R8500 has a built in selection of tuning rates ranging from 10Hz to 1MHz in no less than 13 steps, including the all important 9kHz spacing for European medium wave listening. These are selected by two easy to reach buttons alongside the main tuning knob marked TS (tuning step) with up and down arrows, and as the buttons are pressed the tuning step chosen is shown in the display where it remains until changed. The tuning step is completely independent of mode, so if you have an inexplicable desire to tune from 800 to 900 MHz f.m. in 10Hz steps you can do it - even if it will take you all night - but what a flexible feature this is in real use. A fairly esoteric touch is that the tuning steps start from any entered frequency (and this is where you should concentrate on what I'm saying). There are frequency bands where the channels are at 12.5 kHz spacing but at a 6.25kHz offset from a whole frequency unit; for example instead of starting the band at 850MHz the authorities decide to start at 850.00625MHz. With the R8500 you can enter 850.00625MHz using the keypad, select a 12.5kHz tuning step, and then happily tune the band knowing that the 6.25kHz offset has been included and shown on the frequency

display for confirmation. As I said, it's esoteric, but some receivers won't do this, and remove the odd offset the moment you start to tune (including, I have to say, some early ICOM amateur radio gear).

But that's not all: in addition to the built in selection of tuning steps, the user can enter any unique tuning step from 0.5kHz (500Hz) to 199.5kHz in 0.5kHz increments by using the keypad followed by a prod at either TS button to store the new step, for example keying 5.5 followed by 'TS' will set the tuning step to 5.5kHz; or 50 followed by 'TS' sets 50kHz steps. Most comprehensive and thoughtfully executed.

Below the two 'TS' buttons, but intended to be associated with them is a dual function Speech/Lock button. If the optional UT-20 speech synthesiser is fitted, a prod at this button will cause the displayed frequency to be announced, and if my reading of the handbook is correct, the frequency will be announced during scanning when the squelch opens which is very handy for anyone who wants to leave a tape recorder running on voice control when checking a range of frequencies for activity. Not only can you then review the voices recorded but you have a speech identification of the frequency on which the receiver stopped - magic.

The second function of the button is as a dial lock to prevent accidental frequency shifts should the tuning knob get disturbed. ICOM have gone one step further and given you the option of 'Dial Lock' or 'Panel Lock' in which all the front panel controls are disabled; useful if you have inquisitive offspring around. Once again I would comment that someone has been thinking carefully about the facilities in this receiver and all these small details add up to a very comprehensive but useable radio.

Having mentioned keypad entry it must be obvious that the user can enter any operating frequency within the tuning range of the receiver by using the alpha-numeric keys

in the top right hand corner of the panel. Frequencies are entered in MHz format, that is to say MHz followed by a decimal point followed by kHz. If you are accustomed to referring to h.f. frequencies in kHz format, for example 5975kHz, it seems a bit strange having to enter it as 5.975MHz, but bearing in mind the extremely wide coverage of the R8500 it would be very difficult to remember to enter a u.h.f. frequency of 1240.57625MHz as 124057625 kHz. (*It should really be written as 1.24057625GHz - Ed.*) One way round this would be to provide separate 'kHz' and 'MHz' entry keys, but that approach brings its own problems, so no solution is ideal.

Curiously enough I have been discussing with Dick Ganderton the *Short Wave Magazine* standard style, which uses the MHz format, just like the R8500, and despite my own preference for frequencies below 30MHz to be printed as kHz, it seems that ICOM and *Short Wave Magazine* agree - I retire defeated. One nice feature which the format brings in the R8500 is that you do not have to re-enter the entire frequency if you are moving within a 1MHz band, for example when listening on 145.700MHz, you need only push the decimal point key followed by 425 to change the receiver to 145.425MHz.

## Smooth

Tuning the R8500 is smooth and largely free from tuning 'glitches', no doubt due to the use of a DDS (direct digital synthesis) approach to synthesiser design, and there are no loud rasping noises when tuning through strong signals. You can barely hear the 10Hz tuning steps when slowly tuning a steady carrier

in the s.s.b. or c.w. modes, and for all practical purposes the tuning is perfect. As with most synthesised receivers or transceivers these days, there is an automatic tuning rate 'speed-up' when you spin the tuning knob rapidly. In normal tuning there are 400 increments per knob revolution, e.g. using 10Hz steps one knob rotation tunes 4kHz, but the number of steps at larger increments must somehow be reduced since 1MHz steps result in 14MHz per revolution, not the expected 400MHz. The tuning rate changes are not detailed in the operator's manual, so it's a matter of try it and see what happens. When the auto speed-up comes into action, the number of tuning steps increases to 2000 per knob revolution. Now having experienced many receivers using this variable tuning rate system, I've decided that in some cases I don't actually like it, and I will expand on this in another article. However, ICOM have resolved my dilemma by allowing the user to disable the auto speed-up if required, and I found that this suited me very well indeed, given the wide range of tuning increments provided, and I have a feeling that this feature is unique to ICOM.

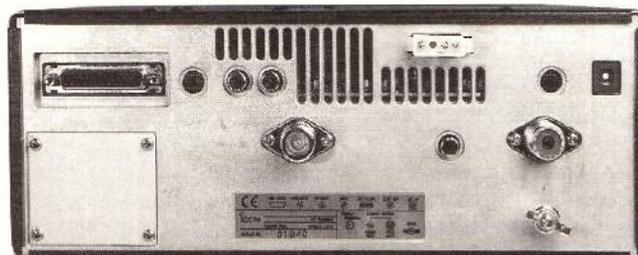
The R8500 does many things, and it's essential for the user to know what's going on inside. All the essential information is presented on a large backlit liquid crystal display utilising a mixture of seven segment sections for numeric information, dedicated legends for functions such as a.g.c. speeds and so on, and matrix displays for text which may change, such as memory bank titles and station names. I must say that I like the current trend towards orange back lighting with clear black

legends, and the R8500 information is extremely clear and unambiguous, with a wide viewing angle from side to side as well as up and down. Alongside the display is a traditional moving coil analogue meter showing signal strength, and this is backlit to match the frequency display. Bearing in mind that the R8500 can be considered a candidate for professional monitoring, it might have been a good idea to show meter calibration in dBm or microvolts as well as the standard 'S' units, but that's only a suggestion, not a complaint.

The entire right hand side of the front panel is taken up by the alpha numeric keypad and controls associated with the memory functions, and this is a section of the review which is really separate from the R8500 as a receiver. I found the memory and scanning facilities extremely comprehensive, and in an area where it is easy for a manufacturer to get completely confused, ICOM have thought things through very well indeed. Bearing in mind that the operators' manual takes 11 full pages to describe all the functions, I will do my best, in a few lines, to give you my own impressions of how the system worked for me. The R8500 provides 1000 memory channels, 20 programmable band edge channels and 1 priority channel. Every one of the frequency memories will store frequency, mode, tuning step, attenuator settings and an eight character name. In addition to this, although curiously not mentioned in the manual, the memory also stores the filter settings in each mode - all in all, pretty comprehensive.

## Memories

The memories are initially arranged in 20 banks of 40 channels, and each bank can also be allocated a name; for example 'Airband' or '2 metres' or 'Med. Wave', and so on. The names are entered using the numeric keypad, but each key also has three letters of the alphabet on it, and these are the letters used in constructing the names of the banks or



# ICOM

memory channels. If a particular bank needs more than 40 channels, the bank can be extended, which, of course, means that another bank must be reduced. But if you wish you could have a single bank containing 800 channels, it's all very flexible. Putting information into memory couldn't be easier, simply select a channel number using the rotary 'M-CH' control (the channel numbers are shown on the main display) and press 'MW'; that's it. Similarly, to clear any channel just select it and press 'M-CL'.

"What about the other 200 memories?" I hear you cry. 100 of these are allocated to a bank called 'AUTO', and how I enjoyed using this one. You can set the R8500 to scan any band of frequencies you wish, such as 118 to 137MHz for the airband, and by selecting the 'AUTO' mode let the receiver scan continuously whilst you go off and have a coffee or watch the *Nine O'clock News*, and when you return the receiver will have been stopping on any occupied channel and popping the frequency into the 'AUTO' memory bank. You now have a bank of active frequencies in store which you can scan as memory channels - so simple, and saves hours of sitting doing it yourself. So, now what do you do with all these active frequencies? easy, ICOM have provided a 'Cut and Paste' facility, which will be familiar to anyone who has used a word processing package. Simply select one of the active channels in the 'AUTO' bank, press 'M-SET' to temporarily store it, and then select a free channel in the memory bank you wish to use, press 'M-SET' again and the entire contents of the stored channel are written into the new memory location. What impressed me about all of these functions is that they are so easy to use, and so logical.

Still missing 100 channels?? They are allocated to the 'SKIP' bank in which is stored those annoying frequencies which are always occupied by continuous transmissions which stop the scanning process but you don't actually want. During the scan of any

frequency band of interest, if the scan stops on a steady but unwanted signal - it might be coming from your own computer, or the TV set, you simply press the 'SKIP' button and that frequency is then memorised and will be skipped over not only in any future band scan, but in any other scan mode including the auto scanning. A further nice feature is that you can ask the receiver to ignore any incoming signal which does not carry voice or music traffic, i.e. steady unmodulated carriers which might otherwise seize up the scanning process. Have ICOM thought of everything? Yes, they have, because even the speed of scanning and length of delay on resuming the scan are adjustable by the operator.

The whole memory arrangement is rather like having a series of written logbooks to which you can refer by looking up a title 'AIRBAND', 'SHORT WAVE' and so on, and in these books you can select a frequency of interest which can also be named 'LONDON', 'RADAR', and so on. It's well thought out and easy to use even for someone as dim as me. For any user wishing to assemble a comprehensive collection of frequencies of interest, the R8500 is just ideal, and it's hard for me to find any feature which has not been included.

## Computer Control

The rear panel of the R8500 carries the RS-232 connector for external computer control, and comprehensive details are included in the operating manual of all the commands available. It seems that everything on the front panel is controllable via the computer port, including analogue functions such as a.f. gain, squelch setting, i.f. shift, and a.p.f. control. I assume that the many independent software writers will have a field day in writing for the

R8500, so watch out for some very interesting packages in the future. There are three antenna inputs; an 'N' type connector for use from 30MHz to 2GHz; an SO-239 for 50Ω input from 100kHz to 30MHz and a phono socket providing a 500Ω input for the same frequency range. Selection of the 50 or 500Ω input is controlled from the front panel, so it would be easy to have two h.f. antennas connected and select them according to your needs.

A 'remote' jack allows connection to the standard ICOM control system so that the R8500 can be linked to compatible transceivers or receivers from the ICOM range, whilst an 'IF' output connects to the optional TV-R7100 receive adapter to provide stereo sound and TV facilities. The 'AGC' jack can either feed a.g.c. to the TV-R7100 or, with a connector change over inside the R8500 provides an audio feed without de-emphasis for 9600 Baud data use in the f.m. mode. There are two power input connectors, one being for a feed from a regulated 13.8V d.c. supply and a second for use with an ICOM AC-55 a.c. mains adaptor which needs further regulation built in to the R8500. I ran the input supply down to 10V d.c. before the receiver failed to operate, so the nominal 11 to 15V supply range is well exceeded in practice.

## Conclusions

It's hard to know where to stop with such a comprehensive unit as the R8500, because the manufacturers seem to have thought of everything. As far as r.f. performance is concerned, their stated aim was to produce a receiver which incorporated all the advances made in the ICOM h.f. transceivers, and in this they have succeeded. The published 3rd order intercept point of +27.5dBm. albeit

using the optional 500Hz c.w. filter has been achieved, and the sensitivity on h.f. averages a healthy -123dBm (s.s.b. for 10dB S+N/N). v.h.f. and u.h.f. performance is also excellent, although a small caveat must be made in that the receiver, in common with other ICOM receivers, is designed to meet full specification up to 1.000GHz, but above that frequency a converter is used which guarantees spec. between 1.240 to 1.300GHz but not at higher frequencies although the receiver does in fact work to 2.000GHz.

The operating manual is well written and easy to understand, a particular feature being the detailed information on all the connectors and ports which specifies exactly the impedances, connection details and signal levels at each connector. The section on memory management is straightforward and logical, with clear examples of each step to be taken in what is actually a complex procedure, and no one should have any difficulty in making this receiver dance according to his own tune.

Frankly I loved having the R8500 in my hands, even for such a short time and I was impressed by everything about it. It looks like, and handles like a classic h.f. receiver, but has this capability of receiving everything from 100kHz to 2.000GHz. Above all, it was easy to use and get to know, and for the real listening enthusiast, or indeed the listening professional, the R8500 allows you to dispose of every other receiver and simply have it all in one stylish box. At the launch price in the UK of £1549 inc. VAT, it's actually a bargain and even with the optional accessories the price is still very competitive. It's a great product.

My sincere thanks go to **ICOM (UK) Ltd., Sea Street, Herne Bay, Kent CT6 8LD. Tel: (01227) 74300. Internet: <http://www.icomuk.co.uk/>** who kindly offered me the opportunity to review the R8500.

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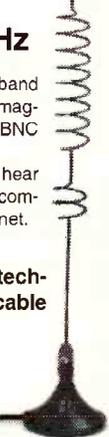
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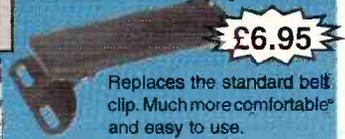
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# Snubbing Medium and Long Wave Broadcast Band QRM

Part 1

*Unwanted signals from strong radio stations is always a problem for the medium and long wave DXers. Joseph J. Carr K4IPV offers some words of wisdom on how to counteract the problems of QRM.*

In the late 1950s and early 1960s I had two close friends who gained their Novice and later General class amateur radio licenses all about the same time as I did. One of them was the late Johnnie Thorne K4NFU (the other was Doug, now EI2CN then K4WQZ). Johnnie (his legal name, by the way, not 'John') lived across the street from WARL, a 1kW country music station, and for a while it rendered his Hammarlund HQ-110 receiver nearly unusable on the lower h.f. bands. The overload was that severe!

The location where K4NFU lived is known among radio buffs even today as 'Intermod Hill' because of the huge amount of radio signals found there. It is one of the highest spots in Arlington County, VA, so it was a natural choice for a radio transmitter site. Today, WARL is now WABS at 5kW. There are also the following stations sharing the site: WAVA-FM (50kW - which shares the WABS tower), WETA-FM (50kW), and the AT&T Long Lines Division microwave relay tower. In addition, the two broadcast towers (WABS/WAVA and WETA) each host a large number of two-way radio landmobile, cellular and other forms of communication antenna. The stations earn

additional revenue by having height for hire to other radio users.

My friend who lived on Intermod Hill had to do two things to cohabit with WARL. First, he had to open the HQ-110 and improve the shielding of the input circuitry. He fashioned a sheet metal screen, and changed the wire from the antenna jack to the input coils to coaxial cable. He also replaced the two-terminal antenna input that was found on early HQ-110s with a coaxial connector. The second thing he did was add a high-pass filter to the receiver antenna input external to the receiver. That filter method is the subject of this article.

Over the past several years I have written several articles for this magazine, and no topic other than radiosciences observing generated more mail than the article on a.m. broadcast band interference. If you live anywhere near an a.m. broadcast band station, then you might have problems, even with a good

receiver (although one distinguishing feature to justify the higher prices of good receivers is better performance in overload situations). It's obviously a 'hot topic'.

In the USA we use only the 530-1700kHz medium wave a.m. broadcast band. Most stations operate with 1 to 10kW of r.f. output power (although a few 250 to 500W local fizzlers also exist). Many stations either go off the air

*Arlington County forms a perfect square, 10 miles to a side, with Washington, DC. The 10-mile square district was authorised in the US Constitution for the national capital, so was once part of the District of Columbia. It was ceded back to Virginia before the Civil War.*

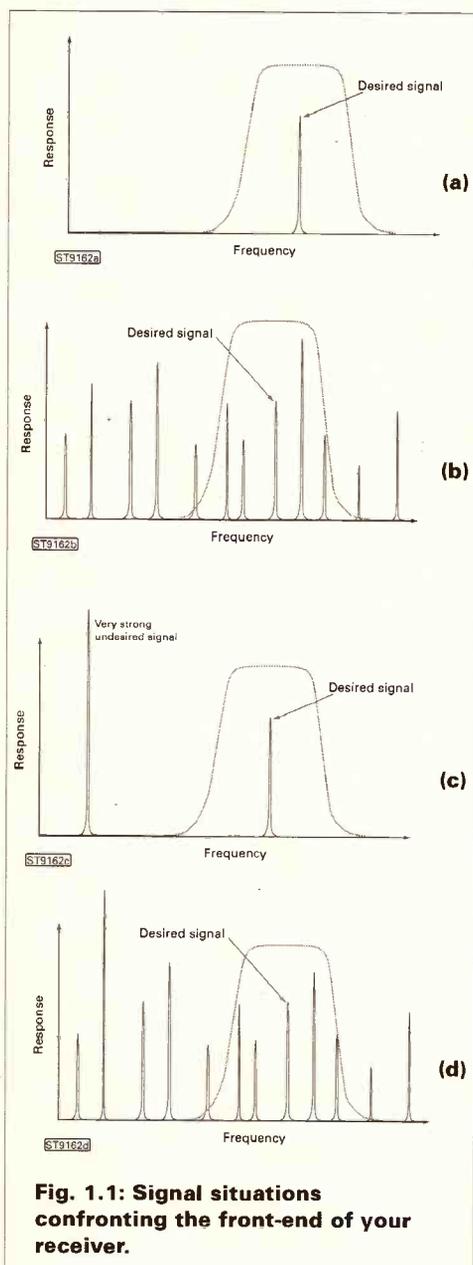
at sundown to protect distant stations on the same frequency, or either radically alter their antenna pattern, reduce power, or both at sundown. A few stations are designated 'clear channel' stations, and operate with 50kW, 24-hours a day. These stations (e.g. WSM Nashville, 650kHz) are on frequencies that are not assigned to other stations for a distance of, I believe, 1300 miles radius. If you live within a few hundred metres of a station anything like those clear-channel blowtorches, then it's possible to see more

than 1V of r.f. appearing at your receiver antenna terminals (one laboratory measured 4V in one case!). In Europe, the receiver also has to content with l.w. broadcast band stations, some of which are powerful enough to make our 50-gallon clear channel stations look more like cigarette lighters than blowtorches. Given that your receiver likes to see signals in the dozens of microvolts level, then you can understand the problem.

## The Problem

So what is the problem? Your receiver, no matter what frequency it receives, is designed to accept only a certain maximum amount of radio frequency energy in the front-end. If more energy is present, then one or more of several overload conditions results. The overload could result from a desired being tuned station is too strong. In other cases, there are simply too many signals within the passband for the receiver front-end to accommodate. In still other cases, a strong out-of-band signal is present.

**Figure 1.1** shows several conditions that your receiver might have to survive. **Figure 1.1a** is the ideal situation. Only one signal exists on the band and it is centered in the passband of the receiver. This never happens, and the problem has existed since Marconi was hawking interest in his wireless company. Indeed, Fessenden and Marconi interfered with each other while reporting yacht races off Long Island around the turn of the century. Not an auspicious beginning for maritime wireless! A more realistic situation is shown in **Fig. 1.1b**. Here we see a large number of signals both in and out of the band signals, both weaker and stronger than the desired signal. Another situation is shown in **Fig. 1.1c** where an extremely strong local station (e.g. a.m. broadcast band signal) is present, but is out of the receiver's front-end



**Fig. 1.1: Signal situations confronting the front-end of your receiver.**

passband. The situation that you probably face is shown in **Fig. 1.1d**: a large out-of-band a.m. broadcast band signal as well as the usual huge number of other signals both in and out of band.

Several different problems result from this situation, all of which are species of front-end overload-caused intermodulation and/or crossmodulation:

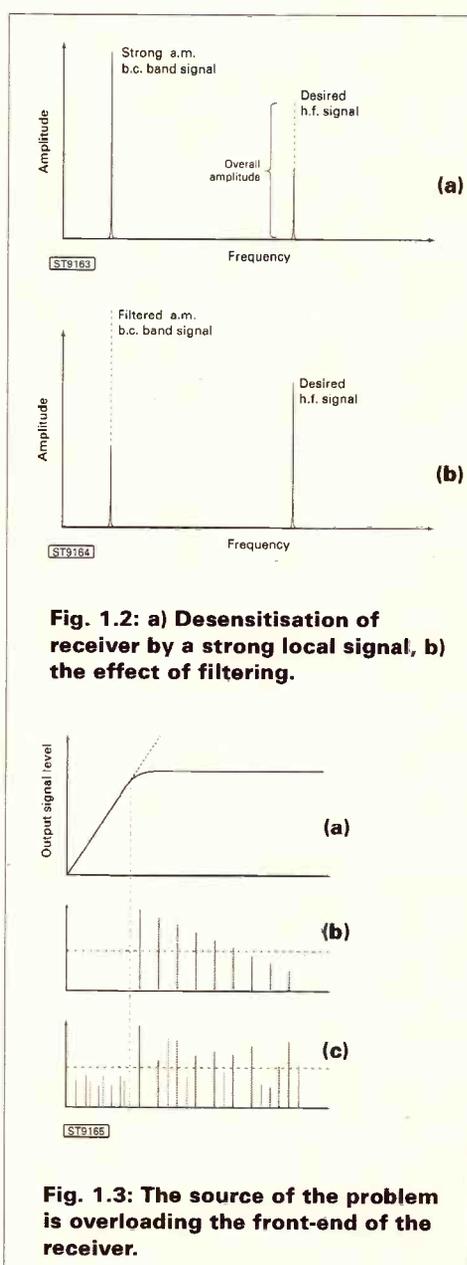
### Blanketing

If you tune across the short wave bands, especially those

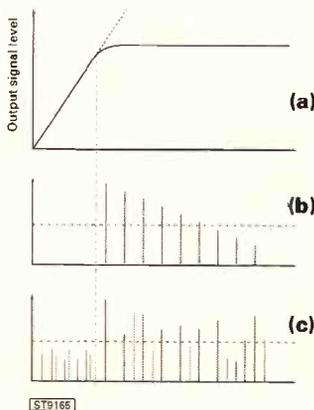
below 10 or 12MHz, and note an a.m. broadcast band signal that seems like it is hundreds of kilohertz wide, then you are witnessing 'blanketing'. It drives the mixer or r.f. amplifier of the receiver clean out of its mind, producing a huge number of spurious signals, and apparently a very wide bandwidth.

### Desensitisation

Your receiver can only accommodate a specified amount of energy in the front-end circuits. This level is expressed in the dynamic



**Fig. 1.2: a) Desensitisation of receiver by a strong local signal, b) the effect of filtering.**



**Fig. 1.3: The source of the problem is overloading the front-end of the receiver.**

range specification of the receiver, and is hinted by the third-order intercept point (TOIP) and -1dB compression point specifications. What happens in desensitisation situations when a strong out-of-band signal is present is shown in **Fig. 1.2b**. The strong out-of-band signal takes up so much of the dynamic range 'head room' that only a small amount of capacity remains for the desired signal. The signal level of the desired signal is thereby reduced to a smaller level. In some cases, the overload is so severe that the desired signal becomes

inaudible. If you can filter out or otherwise attenuate the strong out-of-band signal (**Fig. 1.2b**), then the head room is restored, and the receiver has plenty of capacity to accommodate both signals.

Two more situations are shown in **Fig. 1.3**. In **Fig. 1.3a** we see the response of the receiver when output level is plotted as a function of input signal level. The ideal situation is shown by the dotted line from the 0,0 intercept to an infinitely strong signal. Fat chance! Real radio receivers depart from the ideal and eventually saturate (solid line beyond the dot). The point denoted by the dot on the solid line is the point at which the TOIP is figured, but that's a topic for another article. What's important today is to consider what happens when signals are received that are stronger than the input signal that produces the flattening of the response.

In **Fig. 1.3b** we see the generation of harmonics, i.e. integer (1, 2, 3,...) multiples of the offending signal's fundamental frequency. These harmonics may fall within the passband of your receiver, and are seen as valid signals even though they were generated in the receiver itself!

The intermodulation problem is shown in **Fig. 1.3c**. It occurs when two or more signals are present at the same time. The strong intermodulation products are created when two of these signals heterodyne together. The heterodyne ('mixing') action occurs because the receiver front-end is non-linear at this point. The frequencies produced by just two input frequencies (F1 and F2) are described by  $mF1 \pm nF2$ , where m and n are integers. As you can see, depending on how many frequencies are present and how strong they are, a huge number of spurious signals can be generated by the receiver front-end.

So, what about i.f.

selectivity? You have an i.f. filter of 2.7 to 8kHz (depending on model and mode), so why doesn't it reject the dirty smelly bad-guy signals? The problem is that the damage occurs in the front-end section of the receiver, before the signals encounter the i.f. selectivity filters. The problem is due to an overdriven r.f. amplifier, mixer or both. The only way to deal with this problem is to reduce the level of the offending signal.

## The Attenuator Solution

Some modern receivers are equipped with one or more switchable attenuators in the front-end. Some receivers also include an r.f. gain control that sometimes operates in the same manner. Some receiver operators use external switchable attenuators for exactly the same purpose. The idea behind the attenuator is to reduce all of the signals to the front-end enough to drop the overall energy in the circuit to below the level that can be accommodated without either overload or intermodulation occurring at significant levels. The attenuator reduces both desired and undesired signals, but the perceived ratio is altered when the receiver front-end is degraded to a point where desensitisation occurs, or intermods and harmonics pop up.

## The Antenna Solution

The antenna that you select can make some difference in a.m. broadcast band problems. Generally, a resonant h.f. antenna with its end nulls pointed toward the offending station will provide marginally better performance than a random length wire antenna (which are popular amongst s.w.l.s). Also, it is well known that vertical h.f. antennas are more susceptible to a.m. broadcast band because they respond better to the ground wave electrical field generated by the broadcast band station (DeMaw).

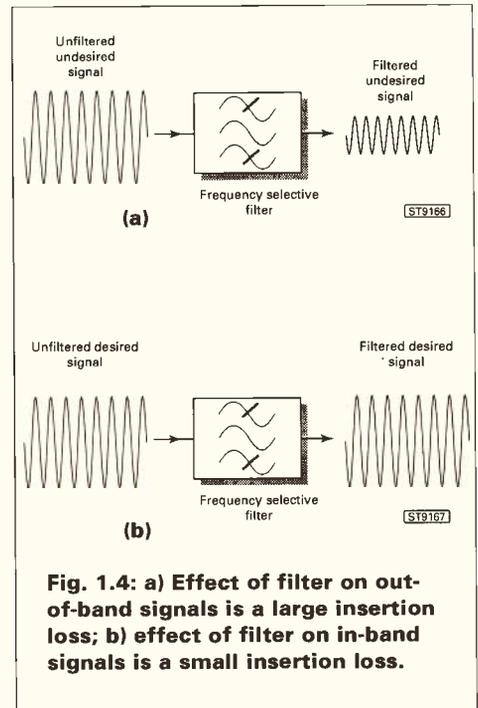
## The Filter Solution

One of the best solutions is to filter out the offending signals before they hit the receiver front-end, while affecting the desired signals minimally. This task is not possible with the attenuator solution, which is an 'equal opportunity' situation because it affects all signals equally. In **Fig. 1.4a** we can see what happens to a signal that is outside the passband of a frequency selective filter: it is severely attenuated. It does not drop to zero, but the reduction can be quite profound in some designs.

Signals within the receiver's passband are not unaffected by the filter, as shown in **Fig. 1.4b**. The loss for in-band signals is, however, considerably less than for out-of-band signals.

This loss is called insertion loss, and is usually quite small (1 or 2dB) compared to the loss for out-of-band signals (lots of dB).

Several different types of filter are used in reducing interference. A high-pass filter passes all signals above a specified cut-off frequency (Fc). The low-pass filter passes all signals below the cut-off frequency. This filter is the type that hams using h.f. transmitters place between the transmitter and antenna to prevent harmonic radiation from interfering with television operation. A bandpass filter passes signals between a lower cut-off frequency (FL) and an upper cut-off frequency (FH). A stop-band filter is just the opposite of a bandpass filter: it stops signals on frequencies between FL and FH, while passing all others. A notch filter, also called a wave trap, will stop a particular frequency (Fo), but not a wide band of frequencies as does the stopband filter. In all cases, these filters stop the frequencies in the designated band, while passing all others. More or less.



**Fig. 1.4: a) Effect of filter on out-of-band signals is a large insertion loss; b) effect of filter on in-band signals is a small insertion loss.**

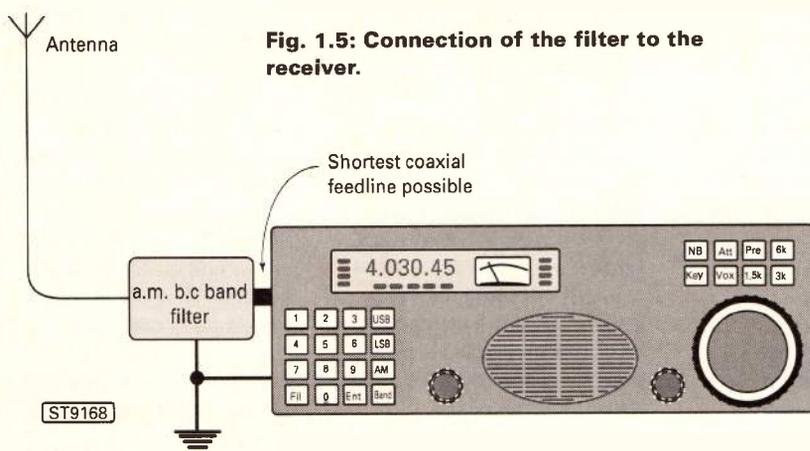
antenna input connector. The best practice, if you have the space at your operating position, is to use a double-male coaxial connector to connect filter output connector to the antenna connector on the receiver. A short piece of coaxial cable can connect the two terminals if this approach is not suitable in your case. Be sure to earth both the ground terminal on the receiver and the ground terminal of the filter (if one is provided). Otherwise, depend on the coaxial connectors' outer shell making the ground connection.

## References

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**Fig. 1.5: Connection of the filter to the receiver.**

The positioning of the filter in your antenna system is shown in **Fig. 1.5**. The ideal location is as close as possible to the

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- ▶ Power voltage from only 2.2-3.5V DC
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NEW



# There's A New Soul

**O**n the 30th of October 1993 the United Kingdom's very first Football Club Radio station - 'RADIO ROVERS' - made its broadcasting debut at Ewood Park, Blackburn, the home of Blackburn Rovers Football Club. The frequency chosen for the station was 1413kHz a.m. on the medium wave band, and the man behind the station was the veteran Manchester TV and Radio broadcaster and producer, Alan Yardley.

Alan, a lifelong Rovers fan, managed to secure sponsorship from British Telecom, and with their help the station was able to take to the air on match days. This was made possible by obtaining a Restricted

*Three years ago Blackburn Rovers Football Club made radio history by launching Radio Rovers, the first medium wave football club radio station. Alan Gale describes how and why the station was conceived.*

## Club Radio

So just what is Club Radio, or Matchday Radio as it is sometimes known, and how did it come into being?



**Blind fan Bob Dysart trying out a set of headphones with Rovers striker Mike Newell and commentator John Aitken. (photo courtesy of Lancashire Evening Telegraph).**



**Newly re-developed Ewood Park Stadium.**

Service Licence from the Department of Trade and Industry. This is a special licence that enables various organisations to broadcast for a period not exceeding 28 days. Usually these broadcasts take place in one continuous block, but in this case the licence was modified to enable it to be stretched to cover the entire English soccer season. The English season runs from August through to May, and, depending on success in Cup competitions, a club may play anything up to 50 plus matches. Since half of these games are likely to be played at home this form of licence is ideal for Club Radio and fulfils this function quite nicely.

Several factors combined to bring this about and we shall look at all of them in this article, but the main one concerns Alan Yardley and goes right back to the days when he had his first taste of broadcasting. Before we look at some of the other factors involved in the development of Football Club Radio Stations we will first take a look at Alan's interesting and varied broadcasting career.

Back in the days when Alan was an aspiring student studying to be an Industrial Chemist at Loughborough University, he was to become involved with the team of people who were responsible for setting up a student radio station on the campus.

instead looking for a career in something that he was really interested in - like radio for instance.

Alan had already done a little work at BBC Radio Lancashire studios in Blackburn, and he'd achieved this after managing to bluff his way in to the station. Alan told me that the thanks for this opportunity go mainly to an understanding receptionist who'd realised that perhaps he was something more than the usual type of person who knocked on the front door of a radio station and announced that they wanted to be a broadcaster. Thanks to having already done some work there previously, and with the security of not only having a university degree in his pocket, but also the experience he'd gained through being a part of the team that had got the university radio station up and running, he then applied for various jobs within the BBC, and was lucky enough to get a few interviews and offers.

Eventually he was to take a job with the station that was then known as BBC Radio Manchester (now GMR Talk!). He would spend many happy years working in radio, involved in both producing and presenting, and, as people tend to do in local radio, doing just about anything. This would include learning how to edit tapes, produce and present programmes, and also be involved in doing such tasks as voice overs, and selecting music for the playlist. During this time he learned how to solder, fix equipment, cajole and plug, and generally develop the kind of background that anyone working in local radio very quickly acquires.

## The Bright Lights

Working in a Network Broadcasting Centre such as the one the BBC have in Manchester meant that the bright lights of television were always flickering. Eventually Alan was offered the chance to do some presenting on childrens television, and also a spot of news reading.

Throughout this period he still managed to remain very much involved in the radio scene. At one time he was the presenter on a mid-day radio show, and as soon as the

This station was called URL - University Radio Loughborough, and would broadcast to all the areas of the campus using an inductive loop system. I'm pleased to say that the station is still going strong nowadays, and continues to broadcast to the campus on a frequency of 963kHz using the name of Loughborough Campus Radio. During his stay at Loughborough he was to spend most of his spare time at the radio station (far too much of it, according to Alan!).

After he'd graduated and it became time to look at his future, he told his Careers Officer that he wanted to be an Industrial Chemist. The Careers Officer, obviously an insightful person, advised him that despite having gained a very good degree he would be better off forgetting about chemistry, and



# nd On The Terraces



half past twelve news came on the radio he would dash down the corridor, put on a suit, and then read the five to one local news on the television. As soon as this had finished he would have to dash back down the corridor and pick up his radio programme again. This had to be done right after the one o'clock radio news finished. Talk about living a double life!

Eventually the TV work was to take him away from radio and lead him into work as a TV Director, first in Regional, and later in Network Television. This would lead to him becoming a Producer and Director at Network Childrens Television where he would do quite a lot of TV work. Despite all this extra work and responsibility, or perhaps even in spite of it, Alan would continue to be a fervent Blackburn Rovers supporter.

On Saturdays, and immediately after finishing his stint as Producer on the childrens programme *Going Live* - this was produced at TV Centre in London and usually finished at around a quarter past twelve - he would dive into his car and make the long journey north up the M1 and M6 Motorways. Often he wouldn't arrive at Ewood Park, Blackburn until around twenty past four, sometimes only just in time to catch the last twenty minutes of the match! In those days Blackburn Rovers were not the major soccer power that they are now, so this will give you some idea of just how committed a Rovers supporter that Alan was.

## The Rovers Return

Alan was to eventually, and perhaps fortunately, experience a situation in which the paths between his Television career and Blackburn Rovers would cross, both in professional and social terms. This situation was to occur whilst he was working as a Series Director on a sports programme that was being produced in Manchester. The programme was to involve a fair amount of TV coverage of Blackburn Rovers and would include features on the Full Members Cup. This meant that he had now become involved with the club on a slightly different

level than that of just a supporter and season ticket holder.

At the time when Rovers were going through their renaissance period, thanks mainly to the involvement of another Rovers fanatic, multi-millionaire steel magnate Jack Walker, major changes were taking place at Ewood Park.

Ambitious plans were being put into operation at Blackburn, and this would not only be in terms of improving the team, but was also to lead to the major re-development of

it sound a bit more informative and professional.

Wendy immediately thought of Alan and approached him as she wasn't too sure what to suggest. "Had he any thoughts?" she asked, Alan said that he had and then went away and put together a package which the club seemed to be very happy with.

As part of this package Alan and Wendy said that they would be happy to put the programme together for the club, but they insisted that its format would have to sound as professional

several seasons ago and it quickly became obvious that what they were actually doing was presenting a radio programme without the radio - broadcast only on the Public Address system!

It wasn't too long after this that they decided to start looking at ways in which they could transform the PA broadcast into a full scale radio broadcast. They looked into ways that this might be achieved, and it was only after very long negotiations, not to mention enormous help from the Radio Authority, that a modified Restricted Service Licence (RSL) was granted and the fledgling Radio Rovers was on its way to becoming a full scale radio station.

With the addition of another well known Radio Lancashire presenter Gerald Jackson, and a commentary team from the Blackburn and District Hospitals Radio Network led by John Aitken, supporters could now listen to a full uninterrupted match commentary without suffering the annoyance of the station switching coverage to another game in the area at a crucial moment.

It may surprise many readers to know that throughout the United Kingdom there are over 400 Hospital Radio stations. For many years now, up to forty in some cases!, a large number of them have regularly carried a full match commentary service to their patients by using landlines connecting their studios to a commentary position in the ground. Prior to the introduction of Club Radio many grounds had a number of special seats which were fitted with headphones and connected to the output from the hospital radio commentary position. The problem with this system was that number of seats were limited, and the visually handicapped supporter would usually find themselves separated from family or friends until after the game, not an ideal situation for vulnerable people.

Thanks to the introduction of Club Radio not only are they now able to sit anywhere in the ground and still hear the full match commentary, but they can also enjoy the full atmosphere of the game alongside their friends. This has given disabled



**Radio Rovers staff being presented with BT 'Touchline' (L to R) Sue Smith - BT Shop Manager, Gerald Jackson - Radio Rovers presenter and Jenni North - Radio Rovers. (photo courtesy of British Telecom).**

the stadium. It was during this period that he was approached by Wendy Howard, well known in the area as a local radio presenter with BBC Radio Lancashire. Wendy was another fan of the Rovers, and it was she that they turned to find out if she knew of anyone who might be interested in coming in to look at their Public Address system, hopefully with some new ideas about how they could perhaps improve its format and make

as that of any other radio station. The programme, they said, would have to contain interviews with the playing staff and management, and, if necessary, commercials. Whatever they did would have to be entertaining and informative, it couldn't just be someone with a tracksuit and microphone running around on the pitch and messing about.

They were given the go-ahead

## There's a New Sound on the Terraces

listeners a sense of freedom that could only previously have been dreamed about.

### A Typical Day

A typical format for a matchday broadcast would usually involve switching the transmitter on at around 10.30am and broadcasting a recorded loop giving the station ID and sponsor jingles. This gives the listener the opportunity to find the station and 'tune in' before the programme commences. The main broadcast will begin at around 11am with a mixture of music and information about the day's play. This will be followed perhaps by a specialist feature - in the case of Radio Rovers *Rhythm of the Blues* - a *Desert Island Discs* type programme in which Wendy Howard interviews one of the ground, or playing staff and plays their favourite records.

After this comes the main part of the programme, the pre-match build up, which includes such items as interviews, competitions, traffic and ticket information, record requests, and information about forthcoming matches. At 3pm the game kicks off and the commentary team will take over. After the game there will be a post match programme with interviews with the team manager or playing staff, a round up of results from the other matches, and perhaps even a phone-in so supporters can pass their opinions of the day's happenings. The broadcast will then wind down towards the close with more music, and will usually finish at around 6 or 7pm. If the match is played in the evening broadcasts usually follow the same format but start at around 4pm and run till 11pm.

### And So The Game Begins

At last the team was ready for the off, and on that famous Saturday in October 1993 when Radio Rovers appeared on the medium wave band for the first time, not only had a new radio station been born, but a pioneering one too. British Football Club Radio broadcasting had kicked-off in the United Kingdom and it was now here to stay!

### Those Other Factors

At the beginning of this article I said that there were a number of other factors that made the development of Football Club Radio possible, in this next section we will look at some of the other events that contributed to,

and made possible the development of this new branch of radio broadcasting.

### "It's Good To Talk"

Setting up your own radio station is all well and good, unfortunately, as with most things in life it costs money. Fortunately, when setting up Radio Rovers Alan Yardley was able to gain the help and sponsorship of Britain's largest telecommunications company British Telecom. BT worked closely with Alan Yardley, and their regional Press Officer, Alan Roberts, was the man involved.

As well as providing a lot of the finance for the setting up of the studios and transmitter, BT also supplied the telephone line for the station. This was introduced in February 1995, and Alan Roberts came up with a very appropriate name for this: 'The Radio Rovers Touch Line!' On match days supporters can call this number and speak to Jenni North, who will take their calls, requests, or competition entries. At other times messages can be left on the answering machine specially donated by the BT Shop in Blackburn.

### The Radio Authority

Following the introduction of the 1990 Broadcasting Act and the abolition of the Independent Broadcasting Authority (IBA) three new bodies were formed to take over its duties. The new body which would become responsible for regulating and licensing Independent Radio Broadcasting in the United Kingdom was called the Radio Authority. This body was to officially begin its new role on the 1st of January 1991.

The introduction of the changes approved in the 1990 Broadcasting Act meant that there would be certain changes to the way in which the development of Independent Radio in the UK would now take. Instead of all transmitters and antennas being supplied by the IBA, Independent Radio Stations would now be free not only to own, but also to operate and maintain their own equipment. Not only was this measure designed to put more control into the hands of the stations,

but it would also mean that stations were now free to 'shop around' for their equipment. This would allow them to rent or buy at the kind of prices they were willing to pay rather than whatever the IBA chose to charge.

As well as the new Authority having the task of monitoring and regulating the country's Independent Radio Services, along with the job of ensuring that they all complied with the requirements of the new Act, the Radio Authority was also tasked with the role of planning frequencies and widening listener choice. One of the ways this was to be achieved was by

the ending of 'Simulcasting', that is, broadcasting the same programme on both the medium wave, and the v.h.f. band 2. This meant that a great many new stations would be able to appear on

the bands, hopefully offering many different styles of programming, formats such as: specialist music stations, talk radio, community radio, and sports.

As smaller stations began to appear they were now obliged to compete for advertising revenue with an ever increasing number of other radio stations. Many stations would find it necessary to 'target' their audience by offering a particular type of programming which was not available to the listener from any other source. This was to be 'Narrowcasting', as opposed to broadcasting, and Club Radio - which was aimed mainly at an audience of football supporters - would be able to provide the kind of dedicated service which, by its very nature, a larger station would find impossible to match since its programming would be required to reach as wide a cross section of the listening audience as possible.

The changes introduced by the 1990 Broadcasting Act meant that the Radio Authority now took over the development of services, which were referred to in Clause 84 of the Bill, as 'Restricted Services'. This term is taken to include all the low-powered services which are, to quote the bill, 'for a particular establishment or other defined location, or a particular event, in the UK'. This new

classification now embraces all Hospital, Student, and 'Special Event' broadcasting. Club Radio, with its low power levels and the fact that it was only to be broadcast at a particular event, meant that it would fit nicely in to this 'Restricted Service Radio' category.

### The Taylor Report

In the aftermath of the terrible tragedy at the Hillsborough Stadium in Sheffield during the F.A. Cup semi-final between Liverpool and Nottingham Forest on the 15th of April 1989, a government inquiry was commissioned under the aegis of Lord Justice Taylor to look into ways of improving safety inside football grounds.

Following the publication of this report in January 1990, the Government gave instructions that all of the clubs in the Premier League and Endleigh League First Division must convert their grounds into all-seaters stadiums by 1994, and the rest of the clubs in the lower divisions must complete their conversion by 1999.

This ruling was to lead to a major re-development of British soccer grounds on a scale that hadn't been seen in years. Not only would the introduction of the all-seater stadiums reduce the capacity of the grounds, but with it also came a change in attitude towards the game and its supporters. This coupled with the formation of the Carling Premier League in season 1992/93, and its association with Sky TV, was to lead to a greater emphasis being placed on all round entertainment. Many of the clubs involved now show a more business-like approach to the game, with off the field activities, such as merchandising, etc., now playing a greater role in the clubs' finances.

*In Part 2 Alan Gale continues the story of Radio Rovers and describes the equipment used by the station.*



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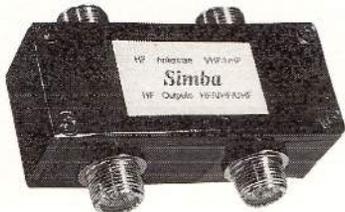


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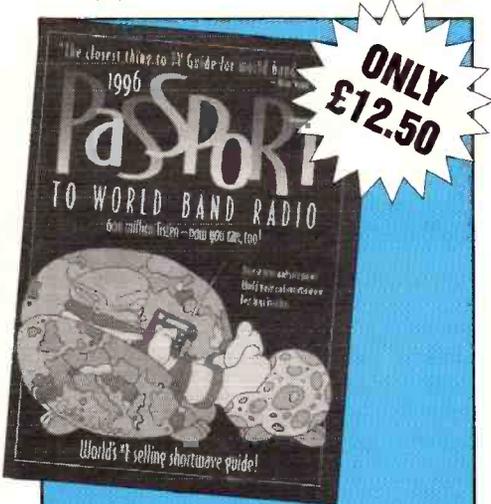
There will be interactive displays, a hi-fi and Home Cinema Theatre, New Media Village and the latest in home entertainment products, which can be purchased at the exhibition in the Retail Village. Exhibitors include: Virgin Games, TDK, Sennheiser, Denon and AJP.

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the Autumn Ideal Home Show and the Home PC Show. Preview day tickets on 18 October will be £10. For £14, visitors will be admitted to all Shows including the International Motor Show.

Connect will be open from 0930 until 1900 from 18-26 October and from 0930 to 1730 on 27 October at the Birmingham NEC. The Advance Ticket Hotline is 0121-767 4114. Please quote reference CO11 when ordering.



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# A Post War Radio System

David White G3YPZ looks at a radio teletype system that was the mainstay of British Government communications. Today a derivation of the original Mark I system is still used for h.f. communication by both military and diplomatic outposts. If you've ever tuned into one you will know why they are called Piccolos.

After the cessation of hostilities in 1945, the many radio monitoring services known as Y stations began to slowly run down their requirements. One of these secret stations, known as Special Communications Unit Nr.3 located at Hanslope Park in north Buckinghamshire, became, in 1947, the Diplomatic Wireless Service handling all Diplomatic Services messages.

Within three years however, this newly formed service found that it needed a large capacity high frequency radio link across the Atlantic Ocean. A cable was in use using 45 baud Teletypewriter machines, but the sheer volume of traffic meant that this circuit was always swamped. This resulted in long delays to messages.

Many channels of radio teleprinters were also in use, but these were slow running only at a speed of 57w.p.m. and subject to constant errors. The network needed much attention by the operators. The normal route was Toronto in Canada to the London traffic centre in Cornwall House, Waterloo.

All the traffic was sent and received via the Hanslope radio receiving station near Milton Keynes. This station also had a vast network of h.f. Morse stations located in British Embassies in nearly every

country of the world. This was necessary due to the fact that the Second World War had cut all normal types of communication.

## Clever Solution Needed

The system was extremely effective. However, although working very well, it could not continue *ad infinitum* due to being extremely labour intensive. Highly skilled operators were needed – long messages were slow to send. A development programme was instated and experiments with a 32-level frequency shift keying system were originated and developed by an ingenious Chief Engineer H. K. Robin and his team.

This system appeared to offer a solution to all the problems involved,

including the fact that embassies are normally located on small sites in the centre of big cities where high power transmitters and big antennas are unsuitable for use. Development of the

multi-tone signalling system got under way in 1958 and a working unit was demonstrated at the h.f. convention held by the IEE in March 1963.

After most of the snags were ironed out, production commenced in 1967 and by 1971, nearly all embassies were equipped with the system known as 33-tone piccolo and was a familiar musical sound on the short wave bands between 6 and 26MHz throughout the 1970s and 1980s.

The speed of communication had been increased to 100w.p.m. (75 baud) which nearly doubled the message throughput. The Piccolo system was also highly accurate and was probably the finest communication system in the world at that time for high density traffic.

Further experiments and development were taking place to try and increase the speed of signalling and reduce the error rate still further and also to decrease the bandwidth of the

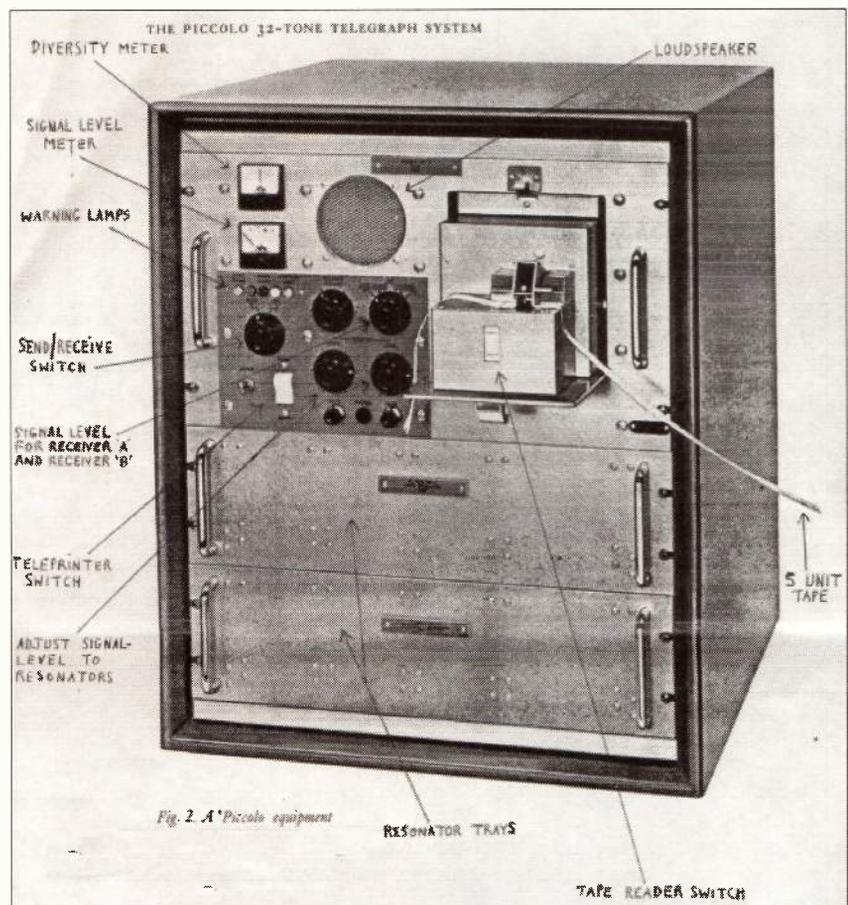
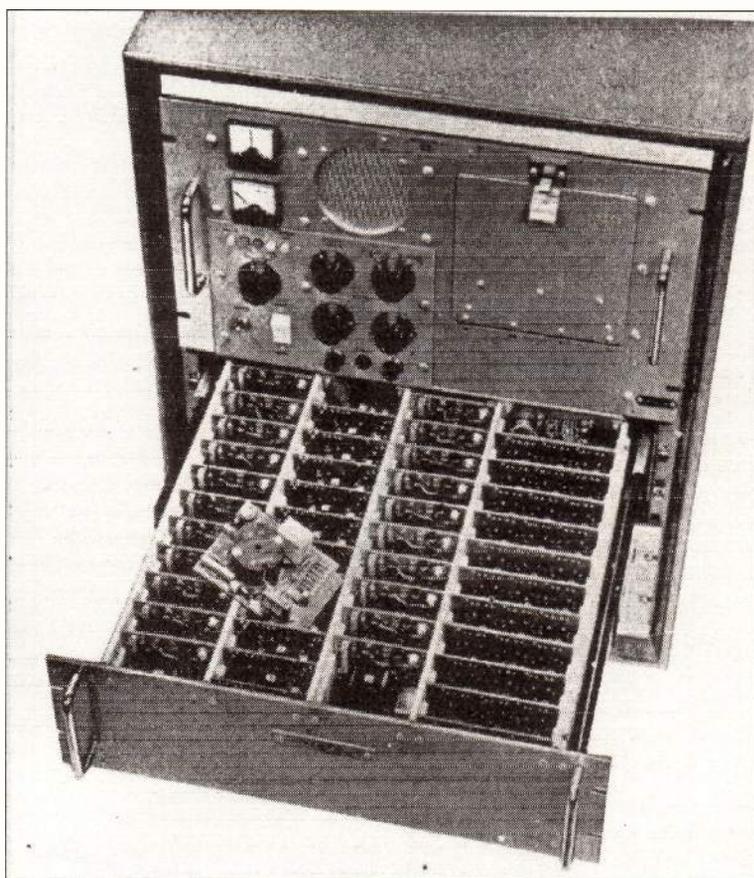


Fig. 2. A 'Piccolo' equipment

A 19in rack mounted Piccolo Mark I equipment.



**Open resonator tray showing the 33 tuned circuits, one for each of the tones in the three rows of slots on the left.**

signal. This was done by using a 6-tone system which was developed and introduced in the late 1970s from then on until the early 1980s, all Embassies and the Hanslope radio station slowly changed over from the 33-tone piccolo to the new 6-tone units which fulfilled all the above requirements with the added bonus that it prepared for error detection with the ultimate intention of connecting it up to a new computerised message handling system.

### More power Needed

All British Embassies had been equipped in 1947 with Mk33 and Mk119 transmitters running approx 40W of output power but this was not really sufficient for long range communication and subsequently a superb transmitter called the 214 running 500W of output power was supplied to all the embassies along with a standardised antenna mast called a monopole which at 7.5m long was an aluminium cylindrical

tapering tube, which resembled a flag pole and was actually used to fly the Union Jack outside the Embassy.

Since the manual system of Morse code utilised pencils and note pads most messages were of necessity kept fairly short. However, the introduction of a single Piccolo connected to a Siemens Teleprinter equipped with a '5 unit' tape allowed traffic which had taken a full day to transmit by Morse, to be accomplished within only two or three hours.

The original Piccolo was a telegraph system utilising multitone frequency shift keying. For transmitting, the system consisted of a bank of 33 audio oscillators each representing one character of the Murray Teleprinter code alphabet. It was designed to run at a rate of ten characters per second and to work with standard 75 baud (100w.p.m.) Teleprinters, particularly the Siemens model T100.

Each tone lasting for only a tenth of a second ranges from

330 to 650kHz, they are amplitude modulated to a depth of 10% with a 10Hz square wave, this is for synchronising purposes. At the receiver end of the circuit, the signal is applied to a bank of 33 tuned resonator circuits. The response of one of these tuned circuits to the incoming tone sequence produces a voltage associated with that particular frequency which is then rectified and connected to a diode matrix which converts the 32 individual outputs to a 5-wire output. This five bit data is in turn, applied to a 75baud Teleprinter which prints the appropriate letter of the alphabet.

### Diversity System

As h.f. radio circuits tend to suffer fading of the signals, due to propagation path

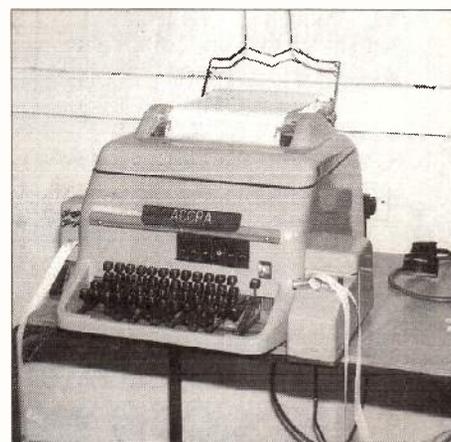
variation which causes loss of output to the Piccolo, so a second set of 33 resonators fed by another receiver were connected to a common output. This process is known as diversity reception. It is used in an attempt to counteract the effect of the signal fading out on one antenna. Due to phase shift effects created by the ionosphere the received signal is usually still present on another separate antenna, which is placed several hundred metres away from the first one, thus ensuring the signal is always present at one of the receivers.

Synchronisation of the receiver with the transmitted signal is achieved by detecting the 10Hz amplitude modulation on the received signal with a 10Hz waveform

generated by the clock system of the receiving Piccolo which is derived from the master oscillator driving the electric motor.

The electric motor drives a tape reader and consists of a synchronous hysteresis motor running on a 300Hz supply and drives its output shaft at 600r.p.m. The tape head reads a standard '5 unit' Teleprinter punched tape, it is a photoelectric affair using a gallium arsenide photoemitting diode as a light source coupled into a sensitive optical system.

The radio side of the system used single side band (l.s.b.). It requires a very stable transmitter/receiver link, the frequency variation must not exceed 1Hz between the transmitted and received tones, therefore, it relied on frequency synthesisers with reference crystal oscillators based on a 1MHz source. These requirements of stability and accuracy were almost unheard of at this time, this coupled with the Piccolos ability to copy signals down in the noise level made it a fantastic and almost unbelievably reliable fast and accurate system of passing messages between the Foreign Office and most overseas embassies for nearly 20 years.



**A Siemens T100 Teleprinter as used with Piccolo at the British Embassy, Accra in Ghana.**

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AR-1500	VGC	£125

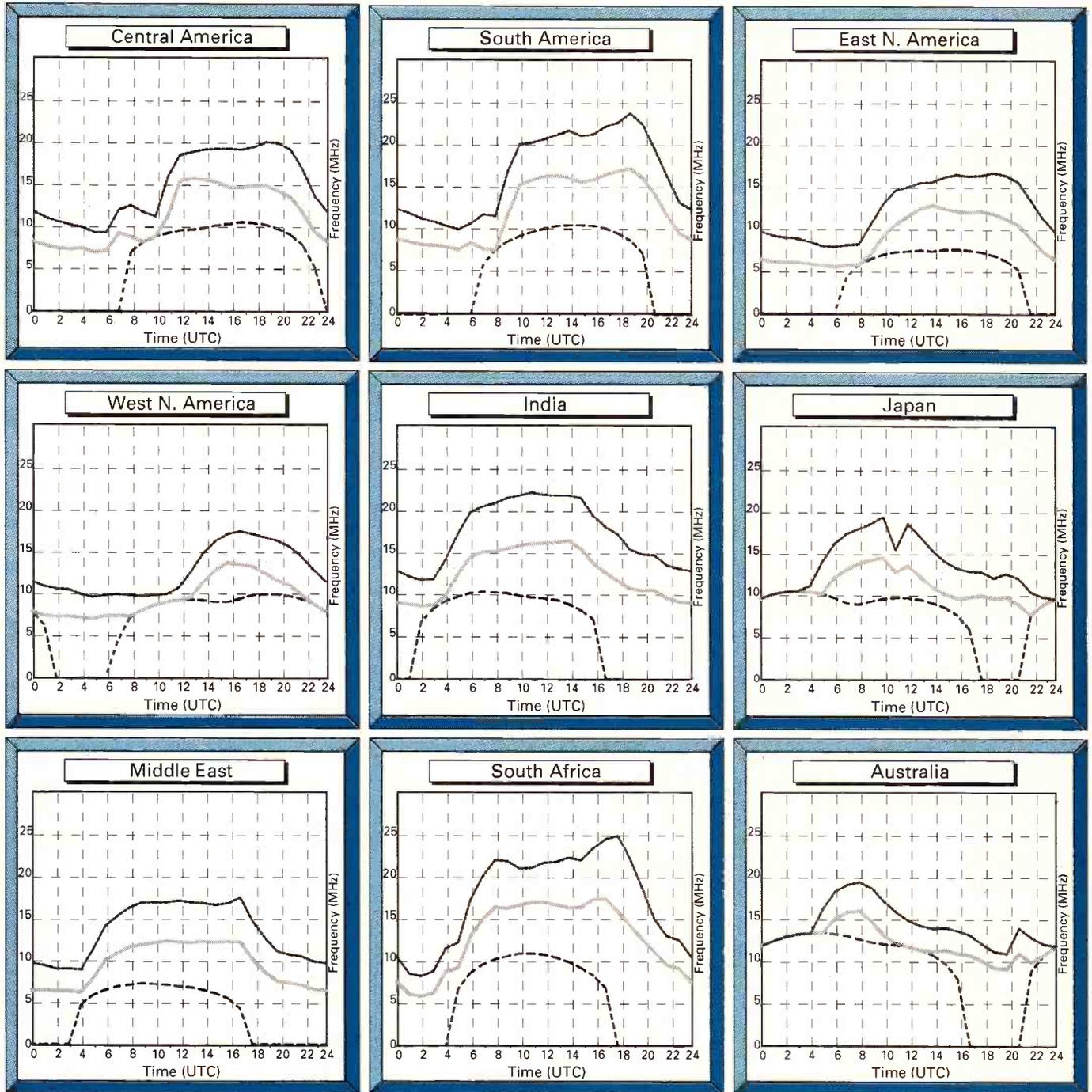
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# World Propagation Forecasts September

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

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

probability of success for the path and time.

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

determined by the values of the intersections of the plots against frequency.

Good luck and happy listening.

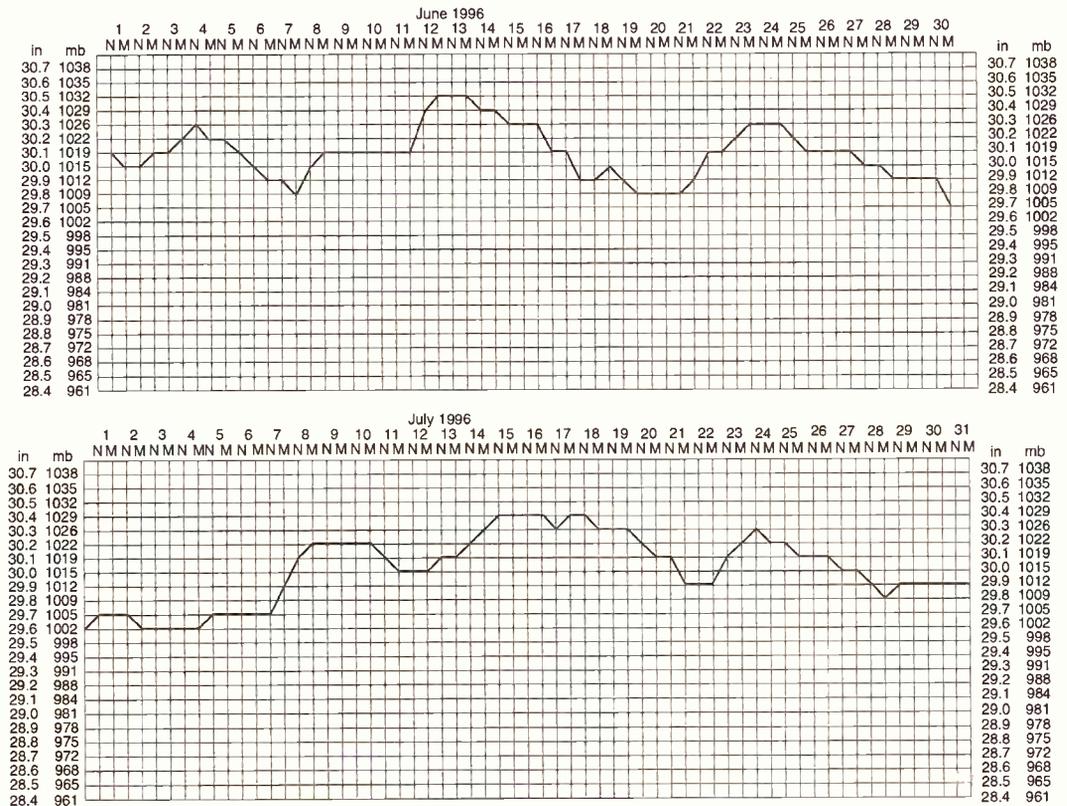
# Propagation Extra

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 has provided two barometric pressure charts for this issue, Fig. 1 covers the month of June 1996, Fig. 2 covers July 1996.

**Fig. 2: Barometric pressure chart for July 1996 taken by Ron Ham at Storrington, E. Sussex.**

**Fig. 1: Barometric pressure chart for June 1996 taken by Ron Ham at Storrington, E. Sussex.**



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# DX Television

Sporadic-E activity during June was surprisingly low with very few openings when compared with previous years. The most productive dates were June 7, 21, 23 and 30. Reception from central and south-eastern Europe predominated once again with fewer openings to Scandinavia and the Iberian Peninsula.

It's not only TV DXers in the United Kingdom that have been suffering from a shortage of Sporadic-E reception. **Pertti Salonen** (Finland) comments that long-range TV signals from the Middle East and Iberian Peninsula have been lacking so far this season.

## Middle East Exotics

At least two Sporadic-E openings to the Middle East have occurred in the United Kingdom. The first took place in Derby on the 23rd at 0913UTC when an Arabic programme was resolved on Channel E2 for several minutes. On the 25th, an Arabic signal was present on Channel E2 between 1125 and 1228UTC, with sound at times. The programmes did not correspond to the schedules of Dubai TV, so the most likely high-power alternative is Iran. On Channel E3, a weak PM5544 test card was visible around 1235UTC. As usual, the signal was too weak to decipher the identification!

## All-day Opening

June 7 produced an intense Sporadic-E opening from Central Europe and the south-east between 0800-2130UTC. Signals identified included the Ukraine (YT-2) on Channel R1, Serbia (PTCb-1) E3, Germany (ARD-1) E2, Corsica (Canal Plus) L4, Italy (RAI UNO) IA and the private Italian station on 47.862MHz.

**John Woodcock** (Basingstoke) logged Slovenian TV (SLO-1) on Channel E3 at 0810UTC followed by programmes on R2 from Hungary or the Czech Republic at 1030UTC. From mid-morning onwards, **Peter Barber** (Coventry) saw the Slovakian PM5544 with 'STV-1' 'BRATISLAVA' identification, while on Channel R1 *Kojak* was being screened by TV Nova (Czech Republic). A caption showing 'PETAK' (Friday) confirms that Peter received

Croatian TV (HRT) on E4. In addition to some of the previous signals, **Shaun Taylor** (Howden) logged Portugal (RTP-1) E3 and Spain (TVE-1) E3 between 1625-2130UTC.

Another excellent Sporadic-E event occurred on June 21 with signals present between 0730-1430UTC. Peter Barber logged Italy (RAI UNO) IA, Ukraine (YT-2) R2, Slovakia (STV-1) R2, Austria (ORF-1) E2a, Slovenia (SLO-1) E3, Serbia (PTCb-1) and Spain (TVE-1) E3. In Derby, during the same opening, Croatia (HRT) E4 was noted without the 'HRT' logo during a subtitled programme. A rare sighting of the Hungarian PM5544 test card (with the identification 'MTV-1' at the top and 'BUDAPEST' in the lower black rectangle), occurred on Channels R1 and R2 but suddenly, at 1120UTC, the transmitters were switched off. This was pure nostalgia, making a change from the usual round-the-clock programmes!

## Mystery Logos

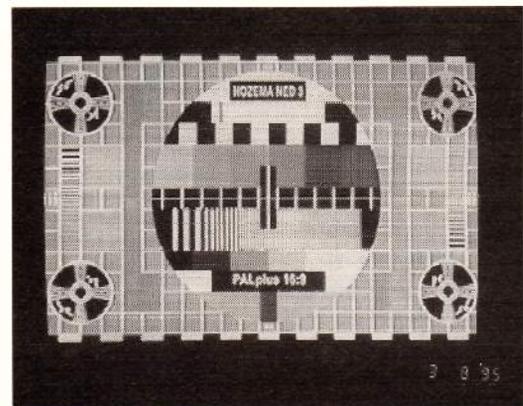
A square enclosing a letter 'C' has mystified several DXers this season. This seems to be Estonia and the square consists of a stack of horizontal white lines.

**Ian Milton** (Tyne and Wear) queries a '1' logo with the letters 'DPT-1' running horizontally through its stem. This sounds like the Russian 1st network, the letters actually reading 'OPT-1' in the Cyrillic alphabet (ORT-1 in the Roman alphabet). This programme was resolved on Channel R1 at 1630UTC on the 10th, while on Channel R2, transmissions from Estonia were present. The latter was also seen by Shaun Taylor (Howden).

## Unusual Channel

The Italian private service 'TVA' has been identified on a frequency between Channels IA and E3. Strong signals were noted from this service on the 23rd between 0910-1000UTC during a pop music programme with the words 'SVEGLIATEVI CON NOI' in the top-left of the screen. Various telephone numbers were displayed at the bottom of the picture, followed by the 'TVA' logo. Peter Barber advises that the vision carrier offset frequency for the TVA transmitter is 200kHz higher than the usual Italian Channel IA

**Fig. 1: A PM5544 variant used for 'Nederland-3' 16:9 widescreen broadcasts. This was photographed by David Small (Cannock).**



frequency of 53.75MHz. Incidentally, signals from the Italian private transmitter on 47.862MHz, that lies just below Channel E2, have been resolved during most of the main Sporadic-E openings this season. Does anyone have information about this station, such as its current proprietors, e.r.p. and location? It displays a 'VIDEO' logo in white in the lower right of the screen. A station called 'Telemarket' once operated on this frequency.

## Tropospheric Reception

Tropospheric reception occurred during mid-June, so perhaps the build up of anti-cyclonic weather systems had some impact on keeping Sporadic-E signals at bay!

**Tony Healless** (Blackburn) identified signals from the Divis transmitter (Channels 21, 24, 27 and 31) in Northern Ireland during the evening of the 16th. Also, RTE-1 and Network-2 broadcasts from Eire were present in Band III, almost snow-free.

**Andrew Burfield** (Braintree) has submitted an excellent tropospheric log covering the weekend period June 14-16. Many Benelux main transmitters were received in perfect colour but the most distant signals originated in Denmark from the TV-2 Odense outlet on Channel



**Fig. 2: Belgian TV news introduction graphics received by Tim Tebbs (New Romney) during a period of tropospheric reception.**



**Fig. 3: A perfect picture from the Bilsdale West Moor transmitter on Channel E29. Signals are received daily by David Edwardson (Wallsend) at a distance of 77km, using only a Group A loft-mounted 14-element antenna.**



**Fig. 4: Identification caption for the French 'La Cinquième' (Fifth) network.**

E22. Several German transmitters were also received, particularly those in the south-west (STWestfunk TV region) close to the French border. Transmitters identified included Haardt Kopf (SWF-3 on Channel E55, ZDF E35 and ARD-1 on E25), Ravensburg E40 (SWF-3 and ZDF E37), Donnersberg (SWF-3 E60),

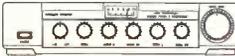
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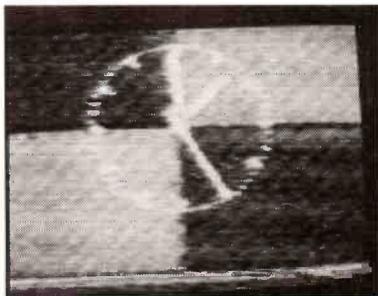
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**73 from Dave G4KQH, Technical Manager.**

Ahrweiler (SWF-3 E56) and Ulm (SDR-3 E64). **Richard Wood** (Redditch) reports tropospheric reception from France on June 9, 14, 25 and 28, notably 'tf 1' on Channels L27 and L29, 'Arte' Channel L35, 'La Cinquième' L34 and 'M6' L37. However, the most startling event was the discovery of 'Canal Plus Espaya' at 0805UTC on the 28th on Channel E35, possibly from the La Coruya outlet. As far as we know this is the first time 'Canal Plus Espaya' transmissions have been identified in the UK. Well done Richard!

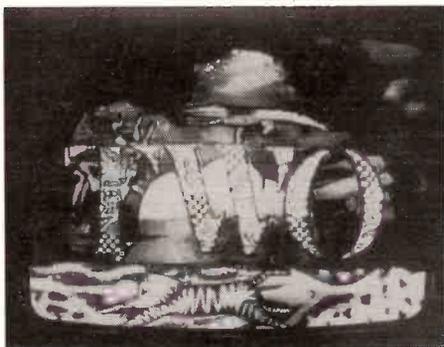


**Fig. 5: Distinctive Croatian clock received on Channel E4 by William Kitching (Telford).**

**Tim Bucknall** (Congleton) has identified strong HTV (Wales) sound on Channel E67 while testing a newly-purchased scanner. Can anyone identify the source of this transmission?

### FM Band DX

**Mike Gaskin** (Cornwall) recalls the excitement of the 14th, which provided the best Sporadic-E



**Fig. 6: An avant-garde design for the 1989 BBC-2 Christmas Identification Symbol used between every programme junction. It featured a rotating menagerie of strange creatures.**

reception of the month, including a couple of transmitters located in the Canary Islands. From 0800UTC, the f.m. band was awash with Spanish transmitters that made any meaningful monitoring impossible for a while. Some of the highlights included an unidentified Arabic station on 105.70MHz (no RDS

code) and RTM 'A' (Morocco) on 88.70MHz (no RDS code). A strange signal with a background of bird song and time pips was heard on 87.6MHz at 0900UTC. The time pips were different from normal ones and the station went onto a news programme in a language Mike couldn't recognise. The signal was eventually swamped by a Spanish station.

At around 1100UTC, the m.u.f. reached 120MHz with virtually nothing resolvable below 89MHz. Mike comments that this frequency-selective effect has been encountered many times before.

### Notched Out

**Chris Howles** (Erdington) has been plagued by strong interference spreading over Channel E2 making it virtually impossible to resolve. A notch filter seems to have done the trick, tuned to reject the offending carrier. Many DXers are suffering interference problems, usually from out-of-band sources. The publication *Guide To DX-TV* suggests some practical remedies and describes

simple filters which can be added. The publication is available via the *SWM Book Store*.

### Unusual Observations

**Andrew Burfield** (Braintree) has noted colour-bar patterns on Channel 61 that appear to originate locally, possibly from a TV repair depot. He has also noticed that the 5.5MHz sound from the Goes (Netherlands) transmitter can be resolved on his normal TV but this only occurs when signals are strong. Can anyone offer an explanation?

Finally, does anyone know the significance of the small translucent square superimposed in the lower right-hand corner of the screen during Central TV programmes from the Waltham transmitter on Channel 61?

### Keep On Writing!

Please send DX-TV 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.

## This is the final part of our competition to WIN an exciting new miniature scanner worth £349.

**R**eviewed in the July issue, the Welz WS1000E is claimed to be the world's smallest scanner. **Waters & Stanton Electronics** have kindly donated one as a prize for one lucky reader to win.

Try your luck at winning this compact scanner by entering our three-part competition.

In July we asked you to spot the five differences on the cartoon, cut out and save the answer form. Last month you had to find the ten words in the Wordsearch, cut out and keep the marked-up letter grid in a safe place. This month all you have to do is answer three simple questions, the answers to which can be found in the review in the July *SWM*.

To enter, write your answers to the questions in the space provided, cut out the form and send it, together with the completed forms from parts 1 & 2, to **Welz WS1000E Competition, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW**.

The closing date for this competition is 26 October 1996. The winner will be announced in the December 1996 issue of *Short Wave Magazine*. The Editor's decision is final and no correspondence will be entered into.

Only fully completed entries can be accepted.

## Questions

1. What is the frequency range of the WS1000E?

2. What is the maximum audio output?

3. How many memory channels does the WS1000E have?

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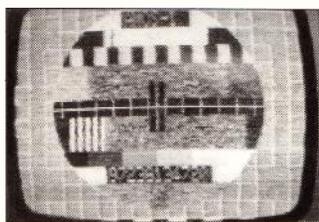
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# Satellite TV News

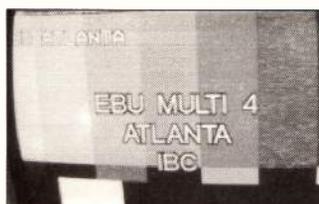
## Heavenly Sightings.....

**D**ave Hawley (London) is himself involved in broadcasting and a satellite enthusiast as well (C and Ku band) and clarifies a point that may confuse. Recent activity on Intelsat 512 at 23°W included a French TV feed stating 'Record TV Multi 1', on other transponders both 'Multi 2' and 'Multi 3' were also transmitting programming. 'Multi' stands for 'Multilateral feed' and provides a programme feed plus clean sound effects but **no** audio commentary and intended for all subscribing broadcasters (live or recorded) to which they add their own commentary/voice-over - or the main audio track may find its way back to the broadcaster by another route and mixed together back at the studio. The Olympic 'Multi' feeds are time-tabled by the event organisers and distributed to interested parties for their own selection. 'UNI' stands for 'Unilateral' and are temporary time or content segmented packages for specific broadcasters seeking a specialised coverage of an event (or part there-of) and may appear in 'down time' on a multi-feed transponder. Each 'Uni' is pre-slotted (identified) to confirmed source and destination. The BBC has its own dedicated Olympics feed that can be mixed with the alternative multilateral feed also incoming from Atlanta. Thanks Dave for all that information.

Non-football enthusiasts will utter sighs of relief now that Euro '96 is over, during that mid-June spell it was more like 'find the



**AMOS-1, the Israeli satellite offers a weakish signal in Southampton at 11.360GHz horizontal**



**An example of a Multilateral feed into Europe ex Atlanta, USA.**

bird' without football on! Rather like the Wimbledon season. Spectacular, too, the on-car camera feeds during the Silverstone British Grand Prix July 14, Intelsat K at 21°W seemed particularly active with outgoing circuits for Europe and points west.

The other main European sporting event mid July was France's 'Tour de France' with the usual spectacular road racing shots from moving cars, helicopters, etc, free from signal dropout as the cyclists made their way around the country. Telecom Rules OK says sat-zapper **Tim MacClellan** (Christchurch), a 5°W Telecom 2B viewer (for home entertainment) as he watched both OB (outside broadcast) feeds and the broadcast programme on 2B. Meanwhile over on Telecom 2C at 3°E another OB circuit was in use feeding back to Paris with more raw footage. Signal levels from the Telecom birds here in the south UK are impressively high, requiring only an 800mm dish for noise-free reception and many of the domestic programmes distributed on 5°W are still not encrypted. OK for aspiring French linguists!

The dramatic event of July for many was the appearance of the AMOS-1 satellite at 4°W, running the PM5544 test card and a clear 'AMOS-1' ident at the top. Unfortunately it now appears that there is only 1 Euro beam available for Europe and this centred on Budapest means that signal levels in the UK are marginal at best (south UK) and unusable north of Watford. Here at Romsey, Amos is a sparkie offering on a 1.5 metre dish, **Roy Carmen** (Sandown, IW) the first person to sight Amos with his 1 metre dish though threshold extension is required, the same with **John Locker** (Wirral) who sends a very shashy test card photograph from his 1.2 metre dish. With Amos signals down to 40dBW across central UK you'll need a 2 metre dish to make for entertainment quality signals. This is unfortunate as considerable interest had been shown in the installation trade since many Jewish communities had expressed interest in an Hebrew language service. Check out 11.306GHz (audio carrier 6.60MHz) horizontal for AMOS-1. Once the Amos output has been confirmed OK then it's likely the Intelsat 1°W Israeli spot beams will be transferred onto Amos, 1°W Intelsat is then likely to swivel its dishes and spot onto Scandinavia

from this now Nordic very hot-spot in the sky.

**Ian Waller** (Lincoln) confirms that PAS-3R at 43°W had been active late June into July with Wimbledon for RTL+, more important is that the Russian GALS has been confirmed at 12.170GHz with weak signals on his 1.7m dish running ETB in SECAM. A more recent report suggests that GALS 1 and 2 have been moved from their parking 71°E slot and in theory were transferring to a new slot at 39°E, Ian confirms with John Locker that GALS can be seen at 36°E. Check out 11.840GHz right-hand circular as well. Another flash of intrigue has been the sighting of Russian captions at or about 33°E, these tune in at the usual Louth frequency of 11.525GHz and include the wording 'TCl Gorizont'. Research has proved this is Gorizont 17 in heavily inclined orbit (about 5°) and currently peaks in the Clarke Belt at 0700 and 1900UTC. It carries programming or captions from time to time, an unusual catch. Stay tuned to this spot.

Sat-zapping doesn't need a large dish, that's according to **John Neal** (Ilford) who on holiday took a Lenson Heath 480mm dish and successfully logged signals from 42°E (Turksat) round to PAS-1 at 45°W. The LNB is a 0.7dB noise Cambridge Universal into an Alba ISR7000 - not Jodrell Bank but more cost effective! John also confirms that the Italian racing formally on Eutelsat II F3 at 16°E has now re-appeared at Eutelsat II F2 at 10°E, uplinked from Lario Earth station - it's transmitted at 11.162GHz horizontal in PAL and clear.

**Marcus Tate** (Bolton) asks about stabilising the sound in sync (SIS) feeds on Eutelsat II F4 at 7°E. The SIS feeds have been used for many years and it's likely that they'll go digital in the future - the EBU had previously indicated they were going into Nokia line shuffle encryption two years ago but didn't. It's possible to buy sync stabilisers for locking the pictures (that move according to the accompanying audio within line syncs) merely by feeding the baseband video out into a sync stabiliser (or inserter) and then recovering the now stable signal via the decoder Skart if fitted. If the Skart is lacking the baseband video phono out can be fed into the inserter, then into the baseband video in of a TV, VCR or even a modulator. The non-audio stabiliser can cost around £75 but an 'EBU decoder' that will lock

**UNILATERAL**  
SYN 28905  
SIRTVS LJUBLJANA  
FOR  
GLUCCT  
20.30-20.40 GMT

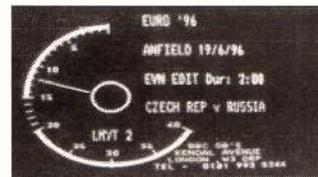
**A Unilateral feed outbound from Ljubljana.**



**An NTSC Olympic feed for TVE Spain via their Hispasat 30°W bird.**



**Dr. Dish TV is a satellite enthusiasts' TV surgery carried on 2nd and 4th Fridays of each month at 2100-2230CET 11.675GHz horizontal.**



**VTR clock with BBC payout of Euro '96 football match interview package running two minutes.**

pictures and recover audio can be purchased from various satellite dealers costing around £50, input via Skart. Remember that the EBU distribution feeds at present in SIS may eventually go digital - your SIS stabiliser will be then be without a purpose and you'll have lost your money. Consider it a short term investment!

A reader's post card advises that 'PINK TV' is a Serbian TV programme each Sunday 1200-1800CET at 11.181GHz on Eutelsat II F4 at 7°E; and that the 16°E Thaiwave programme has now ended - the broadcaster didn't pay the bill!

Our Sri Lankan reader **Bandula Gunasekera** has now installed his Ku/Telecom band LNB on a 600mm dish and received the first Ku signals in his region (Colombo) with a sparkie NHK Tokyo news feed in NTSC at 12.600GHz vertical. Also from PAS-4 at 68°E but in C Band another new capture, that of 'WE TV' at 4.034GHz horizontal and in late June they were still testing.

# Bandscan

## Australia

My Internet attachment has continued with the preparation and delivery of a number of Hyper-Text Markup Language (HTML) courses in the past few months. Nonetheless, I have not allowed dust to gather on the receiver and my efforts collecting broadcasting information has continued apace.

This month I have news on funding cuts at the Australian Broadcasting Corporation (ABC), the latest short wave frequency schedules from this part of the world, a few Internet sites of interest and a grab bag of other snippets of interest.

### Australian Broadcasting Corporation

As foreshadowed in this column in June this year, the axe has fallen on the ABC. Although not expected until the 20 August budget, the government has announced that the ABC's funding will be cut by \$A65 million (about £34 million) over the next two years. This cut will be \$A10 million (£5 million) in the 1996-97 financial year as a so-called 'once-off' reduction in running costs and a further \$A55 million (£29 million) in financial year 1997-98. Beyond that period, the new Minister for Communications and the Arts Senator Alston says ABC funding is subject to negotiation.

As could be expected, Senator Alston has denied that this cut, which represents a staggering 10% of budget, breaks a pre-election commitment to maintain funding at current levels.

The Senator has also announced a review of the ABC's future role and direction and a plan to put the operation of the struggling Australia Television out to tender. Alston has also stated that there is a case for adopting the UK Channel 4 option of contracting out all areas of ABC operations except news and current affairs.

Unimpressed, the ABC managing director voiced his concern that Australian content would be affected. Equally unimpressed with budget cuts coming before rather than after a review and concerned at the possible loss of 1300 jobs, ABC staff voted for a 24 hour strike. Whether the budget brings yet further bad news for the ABC remains to be seen.

### Australasian Frequencies

**Bill Rigby** of Horwich in Lancashire has asked me for some Australian frequencies to try. The obvious broadcasters to try here are the ABC, Radio Australia (RA) service, Radio New Zealand International (RNZI) and the Papua New Guinea short wave service. It is about time to bring these

details to other SWM readers as well.

Radio Australia (RA) English language services are no longer targeted at Europe but can nonetheless be readily heard by listeners there. Despite all those antennas sucking signals in the Asia and Pacific areas, the signal does not appear to be used up and regularly finds its way to the UK!

Anyway, RA can be heard from 0800-1100UTC on 21.725MHz, 1100-1300UTC on 15.530MHz, 1100-1800 on 9.615MHz, 1430-1800 on 11.660MHz, 1430-1900UTC on 6.090MHz and 1800-2100 on 7.330MHz. For the Internet connected, use

<http://www.abc.net.au/ra/> for current RA information.

Radio New Zealand International (RNZI) is targeted at the Pacific. They advise that their signals will be hard to hear in the northern summer. However, for people willing to try, RNZI is on 6.100MHz from Mon to Fri 0716-1206UTC and Sat-Sun 0758-1206UTC, 6.145MHz on Mon to Fri from 1650-1952UTC, 9.570MHz Mon-Fri 0459-0715 and Sat-Sun 0459-0758; 9.810MHz Sun-Thu 1953-2048 and Fri-Sat 1953-2006, 11.735MHz Sun-Thu 2049-2306MHz and Fri-Sat 2007-2306 and 15.115MHz daily from 2307-0458UTC. RNZI can be found at <http://www.actrix.gen.nz/biz/rnzi/> for more information.

Finally the Papua New Guinea Karai National Radio is on 4.890MHz between 1900-2210UTC, 9.675MHz 2210-0710UTC and back on 4.890MHz from 0710-1200UTC. Use <http://aloha.nmsu.edu/w5gb/swl/karai.nr.txt> for more information on Karai.

### Internet

Another reader has had difficulty in accessing lists of radio stations at <http://www.mit.edu:8001/activities/wmbr/otherstations.html> mentioned in this column for June 1996. One reason was that I inadvertently duplicated the 'edu' part of the URL. The other is that the URL has changed to <http://wmbr.mit.edu/stations/list.html> now. I guess that one can expect such changes on what is by its very nature a very dynamic medium.

And another couple of web sites. The Department of Communications and the Arts (DoCA) web site is at <http://www.dca.gov.au> and the Australian company responsible for the in-PC radio WINRADIO is at the <http://www.kiss.com.au/winradio> web site. The DoCA site has recently won an award for good design.

### Location Of Transmitters

As promised last time, I have compiled

a small list of short wave station locations. Royal Flying Doctor Service transmitters are in four states and territories. In Western Australia there are three sites ranged around the north western coast: VJB Derby on 5.300MHz, VKL Port Hedland on 4.030MHz and VJT Carnarvon on 4.045MHz; one site in the central inland: VKJ Meekatharra on 4.010MHz and one site in the south: VJQ Kalgoorlie on 5.360MHz.

The Northern Territory has one site: VJD Alice Springs on 5.410MHz. South Australia also has one site: VNZ Port Augusta on 4.010MHz. New South Wales has one: VJC Broken Hill on 4.055MHz. Finally, Queensland has two sites in the southern and northern inland, respectively VJJ Charleville on 4.980MHz and VJI Mount Isa on 5.110MHz and one site on the northern coast, VJN Cairns on 5.145MHz.

### Other News

The failure of a UK-made combiner took three television stations off air in Canberra in early July. Despite an absence of spare parts, technicians were able to put two commercial services back on air within eight hours. The multicultural station of the Special Broadcasting Services had to wait three days before the combiner could be repaired in the local region.

After a search which threw up the names of the federal president of the Liberal Party and several commercial media people, the government has announced that Donald McDonald, a long time friend of the Prime Minister, is to take up the position of Chair of the ABC. It will be interesting to see how ABC services are affected under his control in the new economic climate.

In line with its desire to close the gap between expenditure and revenue the new federal government has stopped tariff concessions on amateur radio transceivers. According to Australia's *Radio and Communications* magazine this will translate to around 5% increase in prices in the shops.

Proving that there is nothing new under the sun, the government has announced an enquiry into the use of the sixth television channel. The Minister for Communications and the Arts Senator Alston has stated that he sees no need for an additional commercial television service and is floating a range of options including community broadcasting and educational and arts programming. Because Alston believes that free to air broadcasting is a difficult operating medium, part of the enquiry will consider funding possibilities. That sounds awfully like commercial sponsorship or advertising to me.

Seeing a link between television

portrayal of violence and a massacre in Tasmania in March this year in which over 30 people were shot allegedly by a lone gunman, the government is following through on ideas to put some measure of control on television violence. The main talking point here has been the requirement that all new television sets carry the so-called V-chip to enable parents to prevent their children watching material they consider objectionable. Comment has centred on the fact that it will take many years for V-chip equipped sets to dominate the sets in use because modern sets last such a long time. The other debating point says that given the apparent difficulty that many adults have with existing television and video controls that the children and teenagers will be the only ones capable of understanding how to program the V-chips!

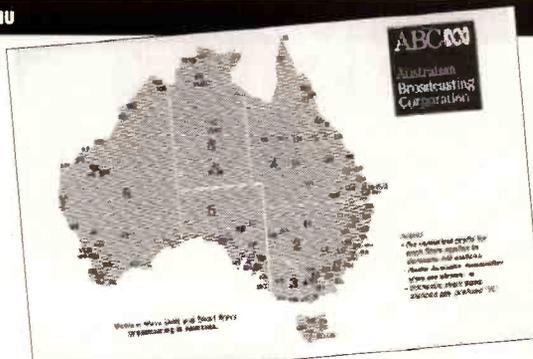
The government has established a committee to examine community concerns with the effects of electromagnetic radiation. The committee will examine and advise on the adequacy of health exposure standards, compliance procedures, national and international research findings and the potential for further research.

My research into Australian pay television schedules turned up a mass of material that is too lengthy to pass on here. The Internet connected can get information on Optus Vision at <http://www.optusvision.com.au> and on Foxtel at <http://www.foxtel.com.au> for details.

In the context of pay television I have to note that despite advertising expenditure of around \$A10 million (£5 million) a recent survey has shown that only 1% of people have subscribed to pay television services. In addition, more than 80% of the people surveyed indicated that they had no intention of subscribing to pay television now or in the future. Around one third of people claim not to need pay television and nearly a quarter state price as a big stumbling block.

And for a final couple of frequencies the Radio Republik Indonesia station at Pekamaru is on 5.040MHz and at Sorong is on 4.875MHz.

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 can be found in the column banner. For personal replies please send two IRCs. Those with an Internet connection can get me at [greg@pcug.org.au](mailto:greg@pcug.org.au)



# 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.

We start this month with a query on joining a club, from our regular anonymous contributor. There are two areas to look at, namely local clubs and national groups. If you aim at getting a 'ticket' or joining in such local activities as Field Days, RAE classes and so on, you should find and join your local club. Listings appear in this magazine, in *Practical Wireless* and in RSGB's *Radio Communication* and, of course, some are mentioned on the various GB2RS Sunday broadcasts. Bear in mind that a local club only gets a mention if it makes a report!

If you go to a meeting, **don't** just sit in the corner and wait for someone else to speak. **Do** be friendly; the regulars are just as afraid of you as you are of them! It is up to a newcomer to make friends.

Now to the nationals; ISWL is predominantly a listeners' body but with a sizeable crop of transmitting members and it's been around for about fifty years. The ILA was formed over a decade ago specially for listeners by Trevor Morgan GW4OXB and it covers all sorts of listening activities.

Obviously my personal bias is toward the RSGB having been a member for forty-plus years, but while you are a s.w.l. the ILA has much to commend it. Both ISWL and ILA cater for more than amateur-bands-only listeners and both put out nice newsletters. If you are into home construction of simple gear, then membership of the G-QRP Club goes without saying - they are dishing out membership numbers around the 10000 mark. That leaves just one other society that I can think of to mention: UKRS. This one is so new that I can't even tell you whether or not it will cater for s.w.l.s. other than amateur bands.

### Other Letters

**Dennis Miller** in Dawlish wonders about G3NOM/ZC6. Back nearly fifty years ago there was a country called Palestine, and its prefix was ZC6, or later 4X1. Palestine disappeared from the DXCC listings in 1968 and was replaced by the modern state of Israel. G3NOM/ZC6 was operating in the Gaza Strip. This same Ray Gerrard G3NOM was also involved with the 1995 XY1HT effort from Yangon, Myanmar. Other things being equal, I reckon this was a 'good un'.

Another one to be questioned

by Dennis was 4U/DA1KY, heard at 0900UTC 14.210MHz on June 18. Given the call was genuine, it wasn't necessarily a 'portable' activity. My gut reaction is that this one is OK, but comments from readers would be welcomed. As a matter of interest I seem to recall that years ago DA1KY used to occasionally write to the DX column in the old *Short Wave Magazine*.

Quite a long letter from **Andy Bright** in Watford. who was busy in the first part of June with other things - like football-watching, carp-catching and incinerating meat in a barbecue. Since then he has had the odd listen round. Andy snagged KH4/NH6D, but was absolutely appalled by the behaviour of some ops who seemed hell-bent on stopping others from having a contact. He is another to mention the ZC6; these prefixes were parts of the British Empire back in the 1940s, along with the V series, and some Ms too, such as MD5DO. The 'military' connotation does not exist nowadays. ZC4 was the prefix for Cyprus when that country was a part of the British Empire. Nowadays, ZC4 is reserved to those parts of Cyprus that are still British and as such remain under UK administration. The rest of Cyprus is, of course, an independent country; the 'sovereign bases' were part of the deal that gave independence.

Now to the log. On 3.5MHz Andy noted C53HG, LU1XIK (Santa Cruz, 50° S Latitude), VK3DZM, VK5MS, V51GB, VK3EW, 5V7ML, 9J2GA, UA9FAR, 9G1MR, TT8AM, 5R8EN, TI5RLI and XT2DP, all of course sideband and hence around 3.795MHz. At 7MHz I note PR80L, 9G1YR, ET3BT, a questioned XW6DR, JX10M, J37LF, ZP1ES, EL2RR, TT8AM, CM2SB, ZL4BO, TI5RLI and OA4CPY. Down again to 14MHz where the entries included FS5HI, 8S4FRO for an odd Swedish call, HK6/N2ZLG, CX2TC, 9Y4NZ, PZ1EA, FG5FC, KH4/NH6D, 5R8EN, 9U5CW, TJ1RA, C53HG, TT8BP/M, KH6WU, OA4QV, HK0OEP (San Andres), KE4TUU/KL7/M, KS6DV, C21TT, V51BO, J73PB, YV5ESN/7, C6AGR, HP6AYV, PJ2MI, OH0/SM0AJV, HL3ADI, A71CQ, AP2AMR, LU1ARL, A45ZN, HI8HFO, VP2MHT, YV3BAP, EL2RR, S92YL, 5N0PYL, BV5BG, JH7LLRS, 9J2DI, KH2Y/ZC6, PT2GTI, XE1YQR and SU1JR. A look at 18MHz came up with BV2KI, XX9GD, VP2EYE, LU2NI, KO6HL, TI2LL, HK1FGE, KG4AU, 8P6HG, FY5GF, KP4IX, JA3APL, CP6TG, CE8EIO (Punta Arenas), UA2FCI and ZP5ALI. Finally to 21MHz for OD5CN, Y11RS,

OH0KMG and UU5JBB.

My next letter comes from **Harry Richards** who mentions he heard activity on 14MHz as late as midnight on June 27, with for example WA2JVM working into EA3OT. How might this have happened at the bottom of a sunspot cycle? First, one must recall that individual sunspots appear at random, even though observation over 22 years or so will clearly show the 11-year trend cycle. Thus we might have had a sudden crop of sunspots to excite things on that day. Alternatively it may have been some essentially 'v.h.f.' mode, such as a couple of successive Sporadic-E clouds. It's worth remembering that the EIs are offering the Brendan Trophy for a confirmed 145MHz transatlantic contact not using satellites, and that there is at least one reported hearing of USA on the Two metre band, albeit unverified.

Down in the Isle of Sheppey we find **Ted Trowell**, who reports that he found a few openings on 50MHz, using sideband to log Europeans on the G5RV antenna. For the rest it was all c.w. On 7MHz there were log entries for VK3BYE, KP4XX, CM3JC, VK3VJ, CO3ZD, ZB2AZ and SM5AUR/CE2 while a crank up to 14MHz produced JA7YAA, VU2PTT, JA7FTR, JA0DAI, J28TC, W7SW/MM off the Cape Verde Is, 7X2CR, JR5XPG, JA7IC, JA6SRB, 5N3/SP5XAR, PP2FN, 9J2BO, PR7FB, PR7FB, CM8EI, YV1NX, JA7SSB, K6PZ, K7AU, JA2ZJW, JA7AKH, 9K2MU and J28TC. At 18MHz Ted noted VU2PTT again, along with JE2URF PY2YE, PY2DW and 5N3/SP5XAR. As for 21MHz it offered OY1CT.

### Prefixes

Canadian amateurs, between June 8 and August 8, could have used a special prefix as follows: VA2s could use VD2; VA3 used VD3; VE1 used VC1; VE2/VC2; VE3/VC3; VE4/VC4; VE5/VC5; VE6/VC6; VE7/VC7; VE8/VC8; VE9/VC9; VO1/CZ5; VO2/CZ4; VY1/CK3; and VY2 used CK4.

### QSL Addresses

Three from Ted Trowell: 5N3/SP5XAR via SP5CPR; J28TC via F6FNU; 7X2CR via IS0LYN.

From the RSGB *DX News Sheet*, FH5AM/FR to Box 44 CP 97610 DzAoudzi, Mayotte Island; R0/UR8LV on Andrey Island (IOTA

AS-63) to his own call at PO Box 32, Dickson Island 663241, Russia. Finally WJ20 is planning an October tour of Africa to include Swaziland 3DA and the cards for this exercise go to D. Farnsworth, POB 16, McConnellsville NY 13401, USA.

From John Collins in Birmingham we get EK0AK to Box 22 Yerevan, Armenian Republic; YV4ERB to Box 510 Valencia, Venezuela; ED55CC to EA5URL; W4/HB9IQH to his home call address; J73VE to K4SPQ. Thanks to all contributors to this corner.

### More Letters

Sticking to 14MHz gave **Colin Dean** in Barnsley sideband signals from A41KT, A45ZN, A71DX, A71EF, A71EM, A92GF, AP2EH, AP2N, BV2KI, BV4QC, BV5BG, BV5DR, BV5GQ, CT9F, EK0AK, ET3AA, ET3BT, EX8A, HL1YOF, HS1NGR, JY5SK, KL7XD, SU1SK, TA3YJ, TT8BD, TU2JL, VK5CJC, VP8CTM, VO9DX, VR2KF, VU2PAI, V51BD, XT2DP, Y11AXW, Y11RS, VE3MJQ/YK, KH3Y/ZC6, ZD7BJ, ZD7XY, 3A/DJ8DL, 4L8A, 4S7DA, 4S7RF, 5X1T, 7Q7SB, 7Z1AB, 9K2UB and 9M2KY.

The 7MHz band is the favoured hunting ground for **John Collins** who uses an Eddystone receiver coupled to a CB dipole that lives some 18 metres up in the air. From 0100UTC the band yielded lower sideband from EK0AK, VO2CF, YV4ERB, CX8CP, CE3RLT, CU3DJA, YN8DLK, ED55CC for a special, W4/HB9IQH, HC6NLB, HC1JOL, XE3RLY, EY8MM, SM7DIZ, RV6LDX; from 0200 UTC John noted J73VE, IJ7/K7QHS and R21AN in St Petersburg. Just shows you what a few after-bedtime sessions can offer!

### Minimum

On the GB2RS news today, it was announced that July is to be regarded as 'Solar Minimum.' The use of the term 'sunspot minimum' is now regarded as outdated since there has been so much advance in this field. There is to be a meeting to finalise the new terminology in December. Meanwhile, the fun begins with the new cycle!

Continued on page 61

# SSB Utility Listening

## Boats on GHFS

Up until a few years ago, the USAF Global High Frequency System (GHFS) was used only by aircraft, but in recent years it has been possible to hear boats and even submarines passing messages to various places in the USA. This may not necessarily be a recent change, but the boats are now openly identifying themselves as such, whereas before they may have been just using a 'tri-graph' callsign.

For the past 12 months (at least), there has been an increase in the reports of US ships and other vessels; the most prominent of these has been the 'ships' of the US Army. These 'ships' are in fact US Army *Runnymede* class 'Landing Craft Utility' vessels of the US Army Transportation Corps, and they have been making numerous trips to and from Panama. When these vessels call-up on GHFS frequencies (usually 11.175MHz), they use their callsigns as their identification. Also, once in contact with the GHFS station, they get a 'phone-patch to one of two locations - either one in Panama, or to a US Army base in Virginia.

The site in Panama goes by the name of 'RAIDER' and is at Rodman Naval Station, Panama, the location in Virginia goes by the callsign of 'AAC2', and is actually the Harbourmaster at Fort Eustis where most of the vessels are based. AAC2 also operates on the following frequencies: 6.227, 8.294, 8.297, and 12.365MHz.

Once the vessel is in contact with 'Raider' or 'AAC2', they pass details of their position, course and speed, their ETA to their destination, and their nearest point of land. They

also usually give their name, which helps to identify exactly which ship has which callsign. The position report is a standard latitude and longitude, so a good atlas will help to plot their position. Some of these positions have been in the Pacific Ocean, just off the coast of Mexico, while others have been within the Gulf of Mexico itself. The vessels are quite small, usually only about 1000 tonnes, so they can suffer in rough seas.

Most of the ships are equipped with 1kW h.f. sets, but none of the personnel aboard are trained as Comms personnel, they have to learn how to use h.f. radio on the job, so their operating style is not always in accordance with professional military style.

On this page is a list of craft which have been identified during the past 12 months. Each entry lists the vessels callsign, name and pennant number. One ship remains unidentified; has anyone heard this callsign pass its details to 'Raider'? There are thought to be many more ships than those listed, but the usual sources of information on naval ships (*Jane's Fighting Ships*) only lists a few ships-names and other details. The list on this page has been compiled from loggings over the past 12 months.

## Arklow

Last year, I mentioned a few maritime 'nets' that could be heard on short wave, and asked if anyone knew of any more. In the June issue, I mentioned that lack of information on 'marine' topics. Much to my surprise, I recently received a letter containing details of a 'net'; the author asked to

remain anonymous so I'll respect his wishes.

My 'contact' writes to say that the 'Irish inter-ship' frequency of 2.311MHz is a very good place to start, and that there are regular 'call-ups' throughout the day. The busiest times to listen are at 08.15, 12.15, 16.15 and 20.15 - note that these are all local time, not UTC. When the ships call-up, they report their position, course and speed, and their ETA to various points around the Irish coastline. These points tend to be prominent landmarks, lighthouses or buoys at harbour entrances.

One very busy 'call-up' period is at 20.15, when the fleet of 'Arklow Shipping' call-in to report their whereabouts. The base-station that they all make contact with is at the town of Arklow in County Wicklow. My contact says that there are 28 ships in the fleet, but a check on the ITU maritime callsign database finds only the following callsigns and names:

EIVG	Arklow Abbey
EINK	Arklow Bay
EIJC	Arklow Manor
EJRR	Arklow Marsh
EIND	Arklow Meadow
EIJQ	Arklow Mill
EIRO	Arklow Moor
EIFZ	Arklow Spirit
EING	Arklow Vale
EIFN	Arklow Valley
EIQS	Arklow Valoor
EIRJ	Arklow Venture
EIWK	Arklow View
EIMZ	Arklow Viking
EIQM	Arklow Villa

The base station in Arklow uses the callsign 'Invermore' when communicating with ships in the

fleet. The letter containing this information arrived one morning - just before the 08.15 call-up - so I quickly tuned-in, and immediately heard several ships passing messages. I listened several times in the following days, and heard at least 8 of the above named ships, so the frequency is active at the times specified. My contact also suggested listening to a few other busy frequencies - he suggests 2.246, 2.301 and 4.075MHz. I have not tried any of these frequencies, but they are worth checking from time to time.

## Correction

A small correction is called for. Last month, I mentioned the NASA Shuttle flight, and gave a list of Amateur stations that re-transmit the Shuttle audio. The first station in the list should have been WA3NAN.

## Next Month

Next month, I have a listing of the new USAF Strategic Command frequencies. They became active at the start of June, and a number of reports has helped to tie-down almost all their frequencies.

US Army Landing Craft	
AADT	USAV Aldie (LCU-2004)
AAEA	USAV Chickhorniny (LCU-2011)
AAEB	USAV Chickasaw Bayou (LCU-2012)
AAEF	USAV Ltj William B Bunker (LSV-4)
AAEG	USAV Kennesaw Mountain (LCU-2002)
AAEH	USAV Macon (LCU-2003)
AAEI	USAV Churubusco (LCU-2013)
AAFA	USAV SP4 James A Loux (LSV-6)
AAOU	USAV Manassas (LCU-1667)
ABFV	USAV Marseilles (LCU-1669)
ADMMM	USAV Contreras (LCU-2015)
ADMO	USAV El Caney (LCU-2017)
ADMP	USAV Five Forks (LCU-2018)
ADMT	unknown name
ADMU	USAV Hobkirk (LCU-2023)
ADMW	USAV Northern Hills (LCU-2025)
ADTK	USAV Col Seth Warner (LT-806)
LT	Large Tug
LCU	Landing Craft Utility
LSV	Logistics Support Vessel

Continued from page 60

## Antennas

A resonant antenna such as a coaxial-fed dipole can be used over a narrow band, say a few percent either side of the centre frequency. Outside of that narrow range, one needs to use some sort of antenna system tuning unit (a.s.t.u.) to extract the most from what one has. If one prefers the end-fed arrangement, then again one needs the a.s.t.u. facilities to bring the system to resonance and so extract the maximum from the wire. Don't forget that the operation of an end-fed is critically dependent on the fact that it is completed by its mirror image in the ground - so the more you do to 'silver the mirror' the better the results will be.

My final input for this time comes by way of **Karl Drage**, who posted late and nearly ended in next month's piece! Anyway, Karl has just got himself a new AOR AR-7030 receiver that pleased him mightily - as he says, the bands seem livelier now! An interesting point is that Karl listens on Saturday mornings to listen to the International DX Bulletin on 14.212MHz between 1330 and 1530UTC. This has a pretty comprehensive listing of the upcoming activity-subject of course to people passing the word!

On Top band, Karl logged PY3CEJ while 3.5MHz gave sideband signals from various East Coast Ws, plus PY/LU/PU. Up on 7MHz we note that Commemoration of the Battle of the Somme by TM5SPM, C31YA,

CM, CO, CE, VE3 plus north and South Americans. The big deal, of course, was 14MHz where the list starts with three successive hearings of 3A2MD, an assortment of 4X and 4Z stations, some 5B4s, 5H3s, 5N8HEM, 5X4C, 5Z4s, 7O1JAF, 7X2LS twice, 7X2VZK, 9H3TE, 9H4CM twice, 9K2s, 9N1RHN, 9Q5OWB, 9Q5TR, 9U5CW, A41LZ, A45ZN, A61AM, A61AN, A61AS, A71DX, A92FZ, various BV stations, BZ1LUV, CE4MLN, CO8LF, CX2CW, CX2FR, CX4ACH, CY0AA, EP2MKN, ET3AA, ET3BN, ET3BT four times, FG5FC, FM5BH, FM5GU, HB0/HB9CBK, H10HJP, HK3PDX, HL1SSG, HL5UY, HS1NGR thrice, HS1RU, HS7RE, HZ1TA, many N and S Americans, R0/UR8LV for IOTA Ref AS 054, TT8BP, TU2DP, TU2ZR, V44NEF, V51BP, VP8CWE, VR2KF, various VU

stations, XT2DP, Y11RS, ZC6/G3NOM, ZD7JP and smaller fry. Up on 18MHz we see LU3DL, PJ8AD, TA2ZY, VK6APH, VP2EY and XT2DP. Up again and 21MHz gave with S. America, EC2EGM and EC8AUZ. The 24MHz band snagged Laura 3A2MD again, plus Europeans and RA9AUM; finally 28MHz where the crop of Europeans was interrupted by UY0YI.

## Finito

That's it again for another time. Send your letters, comments and whatever to me to arrive by the first of the month, addressed as always to me at PO Box 4, Newtown, Powys SY16 1ZZ. Meantime, good hunting!

# Airband

## Piper PA-28 Cherokee Warrior.

Photograph:  
Christine Mynek.



No-one has yet replied about the validity of motor insurance when visiting aerodromes (see July 'Airband'). I feel this is really important.

Someone, perhaps **you**, will be enjoying their hobby when they find out the consequences of not being insured. Don't be the one to say that you didn't realise! So, please let me ask **all** readers who drive, take a look at your car insurance. Tell me whether or not third party cover is excluded when on parts of aerodromes shared with aircraft. I'll summarise the results as a 'straw poll' here. Perhaps we can even influence the insurance industry? Go on, do it today!

## Aeronautical Happenings

One place I could drive to was the PFA Rally at Cranfield (the car park is segregated from the aircraft). I went on the Saturday July 6. Oh, what a queue! It took almost an hour and a half to get in to the car park, some people had to wait nearly two hours. Last year, 18000 visitors came by road so it isn't as if the display organisers were caught unawares. They just hadn't bothered to set-up sufficient ticket-sales lanes at the entry point. It's the visitors who suffered and, as one PFA official agreed with me, they would be less likely to attend again in future.

## News

**Ernest Marrows** (Grimsby) has noticed the closure of the spectator area and visitor centre at East Midlands. I'm ashamed to report that the cargo area must grow relentlessly, visitors appear low priority in comparison. Airports never seem to learn. Transport attracts spectators, and has done so ever since 'gongoozlers' came to watch the operation of canals more than 200 years ago. You can't keep them away, you must create a safe area where they won't cause an obstruction. Even some military bases have now put this into practice!

Ernest asks the meaning of 'Charlie' as a substitute for 'Roger' (indicating that a transmission has been received). I think it's retained from the days of Morse, when the letter C was sent to signify Copied (the French say *re\_u*, literally 'received').

Ernest would like to see Chris, our Airband photographer, appear in a picture - in place of her taking one! Well, if you've kept your back-

numbers, see January 1991, page 40, Fig. 3. Meanwhile, I'll see if I can twist her arm into appearing again in the future.

## Research USA

**Roy Dent** sent some information via the Editorial Office. You haven't stated your location/address, Roy. Research in the USA, reports Roy, is applying neural-net computing to the monitoring of aircraft handling. If damage occurs to any control run then the computer re-learns how the aircraft is now behaving. It can therefore interpret normal pilot control demands and convert these inputs into commands that operate the control surfaces. The actual control surface movement could be most unconventional. Initial applications would probably be for fighters that are susceptible to battle damage.

A simple example that I can think of is if the flaps become jammed at an asymmetric setting, the aircraft could well roll to the side of least flap extension. This can be corrected by holding opposite aileron, requiring a fixed control displacement just to fly erect. The neural computer could sense this and apply some aileron without the pilot making a control input. Any control-wheel input would then be added to the aileron displacement by the computer, enabling roll control to continue nearly normally (possibly with restricted authority in the direction to which the displacement applies).

If I may comment, this does sound an exciting development. The problem with self-learning/programming software, such as artificial intelligence and neural systems, is that they are unable to be fully tested. The rules by which they work alter dynamically and come out different in varying situations. It's hard for the software to justify its actions.



Piper Seneca II.

## Follow-Ups

What goes on at Barkston Heath? Last month I explained that it was controlled as an outpost of Cranwell, where the RAF have their Central Flying School. Judging by recent Occurrence Reports, Slingsby 67 type aircraft operate out of Barkston. I'll make an informed guess that the civil-registered Slingsbys are engaged in early training of military pilots but under the auspices of a privatised flying school.

In July there was a debate over the direction from which the wind comes. I'm referring to true bearing (applies to most aeronautical weather reports) or magnetic bearing. The wind at an aerodrome needs to be related to magnetic bearing as the runway's designation number is also based on the magnetic compass. Hence, approach control and a.t.i.s. give magnetic wind direction and I'm grateful to **Martin Sutton** (CAA) for sending the relevant extract from the *Manual of Air Traffic Services Part 1* that clarifies this. At the moment in the UK, the difference is within the limits of resolution of the wind measuring equipment, anyway. If you face true north, then magnetic north is about 3°C anti-clockwise (on your left).

Hawarden now has i.l.s. as reported in June and August. **Paul Lewis** (Hunting Aviation) tells me that the equipment was damaged by a mishap during an airshow when an aircraft failed to take off and continued beyond the end of the runway. Paul has been assigned to repair the system, which should be back on the air by the time you read this.

## Information Sources

Got your *Airband Factsheet* yet? No? Then send a self-addressed, stamped envelope (to hold one A4 sheet) to the Broadstone Editorial Office (**not** to me!). The current one is issue 4.

Here's a correction to *Airband Factsheet*. If ordering from 1 AIDU, RAF Northolt, West End Road, Ruislip, Middlesex, HA4 6NG, then cheques must now be made payable to: HMG Public Sub Account 3653. A useful range of charts is available from the RAF, as well as *En Route Supplements* that list u.h.f. allocations; not forgetting the *Flight Information Handbook*, too. Telephone 0181-845 2300 to check prices. Publications are available to the public by mail order.

## Frequency and Operational News

AIC 69/1996 from the CAA puts Old Sarum's air/ground frequency on 123.2 but I'm not sure if the old one was 125.9 or 125.95MHz. I still don't know the frequency for Sheffield (see July page 63). **Reg Ingleson** (south-east London) tells me that the site will also be called Tinsley and is close to junction 34 on the M1 motorway.

I'm sure that the North Atlantic Track Broadcast on 133.8MHz is most useful. **Dave Carpenter** (Southend) asks about it. Well, Dave, it broadcasts continuously (H24 as they say) but, being v.h.f., can only be received over a limited distance when on the ground. Once airborne at reasonable altitude, it can be copied over a much wider range. I believe that the transmission originates in the west of England, at either Davidstow Moor (near Bodmin) or Winstone (near Cirencester).

**Bill Hillier** (Gwent) has made a study of Concorde's Heathrow operations. Anyone who, like Bill, lives within about 20 miles of its high-altitude track should be able to see it with binoculars on a clear day. Acceleration point outbound is N51° 24' W003° 50' (south-east of Swansea over the Bristol Channel). I believe this can alter seasonally. During acceleration, the aircraft climbs to FL600. Inbound over the Bristol Channel it leaves a visible vapour trail while still at FL390 but this fades on descent.

Certain v.h.f. frequencies are most likely to be used, for simplification I shall call them:



Channel A=126.075 (London Airways), B=127.65 (Shanwick Clearance Delivery), C=129.075 (London Airways), D=134.75 (London Airways), E=134.975 (Heathrow Approach) and F=135.6 (Shannon) all MHz. According to Bill, typical schedules follow. I assume all times to be local. Note that frequencies (especially h.f.) and times can vary. The flight still works London Airways control whilst obtaining its North Atlantic clearance on the second radio box.

**Speedbird Concorde 1.** Depart Heathrow 1030; 1055=channel D; 1100=A; soon after, B; 1120=F; 1130 (SelCall check), 1145 (20°W), 1205 (30°W) Shanwick 5.649MHz then to Gander 8.879MHz.

**Concorde 2.** Calls Shanwick 5.649MHz 1545 (30°W), 1605 (20°W), 1615 (15°W) then to Shannon=channel F; 1648=A (also might call Speedbird

Ops 131.9MHz); 1655=D; 1705=C; 1710=E; lands Heathrow 1725.

**Concorde 3.** Depart Heathrow 1900; 1927=channel D; 1935=A; just before, B; 1955=F; 2005 (SelCall check), 2015 (20°W), 2035 (30°W), 2055 (40°W), 2115 (50°W) Shanwick 5.649MHz then to Gander 122.375MHz.

**Concorde 4.** Calls Shanwick 5.649MHz 2030 (40°W), 2050 (30°W), 2115 (20°W), 2125 (15°W) then to Shannon=channel F; 2150=A (also might call Speedbird Ops 131.9MHz); 2155=D; 2203=C; 2208=E; lands Heathrow 2225.

Bill also asks for help. I can explain about the supersonic tracks. They are fixed as, unlike the lower-altitude organised track system, winds don't have nearly as much effect at Concorde's heights and speeds. Routes have names of the form Sa\* where a is a capital letter and \* a

## Fournier RF-4D at the PFA Rally, Wroughton.

single digit. Routes SM\* are westbound and SL\* or SN\* are eastbound.

The eastern origins of some routes are shown in A/C 34/1996 available from **Aeronautical Information Services, NATS, Room 163, Control Tower Building, London Heathrow Airport, Hounslow, Middlesex TW6 1JJ** but you will need to send a stamped, addressed envelope to hold one A4 sheet. *Aerad* don't produce a supersonic routes chart but I am exploring the possibility of getting one from Jeppesen and will report back in a future issue.

services between Paris and New York?

One day, I'll have space to continue the 'In the Cockpit' feature. I've plenty of photos lined up ready for this! The next three deadlines (for topical information) are September 13, October 18 and November 15. Replies always appear in this column and it is regretted that no direct correspondence is possible. Genuinely urgent information/enquiries: 0181-958 5113 (before 21:30 local please).

Please would readers note that E-mail via the Editorial Office from UK addresses is slower than first-class letter post direct to me. Overseas readers might find E-mail advantageous, though.

## Abbreviations

### Can You Help?

Here's where you could help. Can you supply a schedule for Speedbird 188 or 189? I can't find these in *Flight Routings 1996*. Also, what about Air France Concorde

AIC	Aeronautical Information Circular
a.t.i.s.	automatic terminal information service
CAA	Civil Aviation Authority
FL	flight level
h.f.	high frequency
i.l.s.	instrument landing system
MHz	megahertz
NATS	National Air Traffic Services
PFA	Popular Flying Association
u.h.f.	ultra high frequency
v.h.f.	very high frequency

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# Scanning

There's a lot to go through this month, including some pretty 'hot' information on frequencies and changes.

However, before I start, can I just air my views on a few things that I get letters about that seem to annoy some readers of this piece?

'Scanning' is not the absolute technical piece that some people would like it to be. That's because it is aimed at the scanner user. I try to cover both what the majority want and what the minority would like. It is, therefore, all things to all people. It's also written by the listeners. I just facilitate the info and edit out what's not interesting against what is.

Lastly, I get almost a free reign from the Editor to write it the way I want to write it and, if my mail bag is anything to go by, it's doing its stuff pretty well. If a reader has an issue that they feel needs presenting, then I will do so and if I think that it warrants a personal view then I'll also put that in too. It's the readers' piece because it is their forum - and I'm here to advocate on their behalf.

## Letters

Many, many letters dealing with loads of subjects! I'll nip in straight off with items carried over from the first mail drop for this month. **S. Hudsell** asks for frequencies used on navigable rivers and canals. To the best of my knowledge this would be marine v.h.f. although I have noticed a few narrowboats on inland waterways carrying CBs. I presume - I don't know - that rivers that are navigable by sea-going ships would use marine v.h.f., but those used for pleasure would certainly have CB fitted. Has anyone any idea about this?

Mr. Hudsell lives some 30km from the mouth of the Thames and uses a PRO-44. You don't say what antenna you use but I would have thought that, providing you have a clear view towards the river - no obstructions in the signal path and a roof mounted antenna - you should be able to get something. Most marine stations stand watch on Channel 16 (156.800MHz) so that would be a good place to start. It's n.f.m. by the way.

If you haven't got a roof mounted antenna then the chances are slim. However, having said that, even a roof mounted antenna as high as possible will

not always guarantee results. It's one of the joys of scanning. I'm afraid! The Thames is pretty busy so there will always be traffic available at most times. Try the following:

156.000  
RNLI/HMCG/SAR Channel Zero  
156.300 Intership  
156.375 Coastguard  
Channel 67  
156.600 Port Of  
London Authority Broadcasts.

**G. Curragh** writes in from Peterborough, with a short list of what he receives on his AOR AR-8000 with AOR AR-320 loop. By the way, I've written to you regarding the South African trip! Garry does send in the following lists for u.h.f.:

Perkins Engines:  
462.1250/453.1000MHz  
BellCable Media:  
456.5000/456.0500/461.2875MHz

Thanks for those, Garry.

Also, thanks to the anonymous listener who sent me an entire pad of frequencies taken in by his equipment. Using a PRO-2006, Opto 456 and Amstrad 286 running at 16MHz, a Scanstar Professional, AR-8000, Opto Scout and Drake R8E, this listener passed on a frequency list that rivals the big boys! I'm indebted to you for that and am still working my way through it slowly! I'll report back on what hits I take when I take them.

The photograph this month shows **Ron Greenaway** (rt) and **Jason Shane** of Swindon Aerials installing a CLP 5130-I and Yaesu G-5400B/G-5600B rotators at the QTH of **Richard Gosnell G4MUF**. Richard wrote a while back about the possibility of installing the antenna. Richard is delighted by the results and is happy with the installation. All I can say is that I wish I could afford to put one up! By the way, thanks for the info on the B1Bs and B-52s at Fairford. I did get confirmation from other sources about this detachment, thanks. Keen airband listeners should note they are no longer in residence!

Many, many thanks to all those who responded to my request for information on the old valve radio - a Pye P75A - that I picked up at a boot sale some time ago. I'd specifically like to say thank you to the following people for their assistance: **G. Manning, Mike Barton, L. Mason and G.H. Tillet**. To Mike Barton in particular for the circuit diagram but, to each

**Ron Greenaway (right) and Jason Shane of Swindon Aerials installing the CLP 5130-1 log-periodic and the Yaesu G-5400B/G-5600B rotators.**



of you, thank you very much indeed for your advice and offers of assistance.

In the July issue I carried a request from a listener who asked for assistance with limit scan on his MVT 7100.

**Kenneth Allen G14RSI** very kindly sent on the following that should prove useful.

The contents of a search band can be overwritten as follows:

Press 'Function' key. Press 'Bandwrite' key. Enter the lower limit of the band. Press 'Enter'. Enter upper limit. Press 'Enter'. Press 'Search Band' key and change the search range. Press 'Enter'. You should now hear two beeps that tell you the search range has been changed. Specify the band, e.g. band 6. Press 'Enter' to complete the operation and the receiver will then return to initial frequency. A pictogram follows!

To overwrite the second band (the number 6 key) 422.200MHz to 422.300MHz with f.m. as a chosen mode and 12.5kHz steps.

12.5 Step kHz  
FM  
158.350.0  
Beep. - Select the RX mode and F step.

12.5 step kHz 1234567890  
FM  
158.350.0  
Beep

FUNC MR  
BW - Press 'function key' and then 'band write'.

12.5 Step kHz 1234567890  
FM  
422.2  
Beep.

4 2 2 . 3 > enter. - Enter the lower limit frequency after the entry is completed. The displayed frequency will appear.

12.5 Step MHz 1234567890  
FM  
422.3  
Beep.

4 2 2 . 3 > enter - enter upper limit. After completion the displayed frequency will disappear.

12.5 Step MHz 12324567890  
6  
Beep.

6 - Specify the search band.

12.5 Step MHz  
FM  
158.350.0  
Beep.

Ent - Press enter key. Operation Complete and receiver will return to initial frequency.

I hope that clears it up! My advice to anyone who has a scanner but no operation manual is to get one!

Now, the Airband bit! Many listeners - some 85% of my mail bag in fact - find this area really good. I'm glad of that. It's an interest of mine and is also what seems to be a major part of the listening done by scanner owners in the main. In this section, we'll take a look at what's been sent - and at some hot changes made that may well have repercussions for us in the UK at a later date.

**MC** sends in the following:

119.275 RAF Manston Tower  
119.925 Talk down  
121.500 Distress  
126.350 Manston Approach  
132.450 LATCC Lydd Sector  
132.650 Dover Coastguard working a/c not fitted with marine band for rogue vessel reporting in channel area  
133.450 LATCC Clacton Sector  
134.900 LATCC Dover Sector  
243.000 Distress  
258.500 RAF SAR  
312.325 Manston +  
338.625/344.350/379.025.

Manston is worth listening to if you are in the area as it handles aircraft from all over the world. It is also used for UNHCR flights.

**Godfrey Manning** reminds me that, in response to a request from D. Birch in a previous column, that the danger area I quoted him could possibly have been either a temp. danger area or temp. restricted airspace. Thanks! It was actually the latter - this via AIS Heathrow on 0181-745 3450.

That old curmudgeon, **Oxford Ears**, has been busy again and reports the following heard at his

QTHR:

Brit A-A 259.8/US Magic C/S 300.55/Special Task Gp on 277.775/activity on 242.450. As usual, hyper-activity for OE to get stuck in to - and a 'phone bill to match, no doubt! At this point I'd like to say thanks to OE for his assistance and information and his expertise since we met and no, I don't want to buy the car, thanks!

I think I would have mentioned that the former Black Cat Aviation Group folded earlier this year but is now back - or at least, was when I got the letter. The promised disks didn't arrive so, if Dave is reading, can you send them on? Dave is hoping to revive the group under the title of Air Scan Military Aviation Monitoring Group - and this will be done by sending out disks for £5.00 inc. P&P, on which information will be stored. This info will include all RAF airfield frequencies, AA refuelling frequencies, etc. Plus a h.f. section for stuff like RAF STCICS and GHFS of the USAF. Military callsigns - ground and air - and military SELCAL listings, ICAO airfield codes - the lot! To get an update, you send the disk back to Dave with £1 to cover P&P and receive the updated version. Details will, I hope, follow soon.

Will it come off? I hope so. Black Cat was a good group and it

is sorely missed. I sincerely hope you get your ideas off the ground Dave (sic)!

Now, the promised 'hot' news! Changes are afoot in the European military u.h.f. portion of the band from 225-240MHz, as this is being reassigned to civil use. So, some changes that I am aware of to take this into account is as follows. This will, of course, interest those south coast readers who can hack Dutch Mil but - as I said - this idea is not a new one and it is only a matter of time before we see it instigated here in the UK.

Other, interestingly blistering

news, is as follows:

31st FW A-A freqs:

Victor 10 - 140.025.

Victor 11 - 140.300.

Victor 12 - 138.500.

Victor 13 - 141.425.

Victor 14 - Open.

Victor 15 - 139.150.

Victor 16 - 140.350.

Victor 17 - 141.300.

Victor 18 - 142.200.

How good are these? How about if I told you they came from 'a horse's mouth'?!  
Mildenhall now,

and Squadron Ops - though help is requested on some of these.

7 SOS Talon on 141.500 /

248.425.

21 SOS Dust Devils / 67 SOS Night Owls / 325 SOG Blackcat - 142.375 / 340.425.

21st and 67th SOS Fs wanted.

Talon Ops 418.100.

Shadow Ops 419.200.

Confirmation wanted on 141.500/247.100. On 67th/7th SOS A-A frequencies and for 344.900 - 7th SOS DZ Frequency. Anyone help with this query?

Lastly, I'll round off with some of my 'paranormal' news brief. Keep the letters coming in on incidents involving airmiss and also on incidents when you had your radio with you and things went a bit awry. My sincere thanks to two readers who sent in copy concerning personal incidents whilst scanning for airband out of doors. I'm pretty serious about

this stuff and - as promised - the article on airband and activity of a non-explainable nature is with the editor of the magazine as you read this. Let's hope he prints it soon!

Please keep sending in your experiences on this issue. I'm quite serious about collating and amassing data on the subject and am already gathering quite a file on your experiences. I can guarantee anonymity on this and on your wishes.

Hope you've had good fun on the airshow circuit and elsewhere. Keep the frequencies coming in, as well as all your news and gossip - and keep a low profile! It's just about time to peek at the antennas again before winter comes in and re-secure and grease up, check feeders and connections and sort the shack out. In the meantime, all the best - and catch you down the log sometime.

Old (MHz)	User	New (MHz)
231.000	Spandahlem Dispatch	339.850
231.250	Heidelberg Duke Ops	379.250
231.550	Lippe Radar N.Sector	375.900
232.400	Loneship GCI	338.325
233.850	Laarbruch 4 Sqn ops St.19	246.850
233.975	Laarbruch 4 Sqn A-A St. 21	246.975
235.100	Rheindalen Radar Solingen Sector	308.900

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# Info In Orbit



Mail for 'Info' has included several requests for updates on the manned space station MIR, for the Shuttle and the International Space Station Alpha, so features will occasionally appear here to keep readers up-to-date with developments. I am also very pleased to include an image from GOMS actually received by a SWM reader in Germany!

## Current wxsats

It has been a long time since we heard from NOAA-11, but in mid-July my scanner locked on to 137.77MHz and the characteristic sound of a NOAA beacon was heard. I checked the location of all NOAAs but with NOAA-11 nearly overhead there was no doubt. A few hours later I also heard NOAA-10's beacon. NOAAs 12 and 14 remain the USA's operational polar WXSATs. METEOR 3-5 is currently the operational CIS polar WXSAT. In geostationary orbit, METEOSAT-5 provides Europe with WEFAX images, GOES-8 and 9 are the east USA and west USA imagers respectively, GMS-5 serves Japan and the Far East, and GOMS serves eastern Europe. It is a busy world up there!

## NOAA WXSATs' Status

Latest report from NOAA (USA's National Oceanic and Atmospheric Administration):

NOAA-10 (Launched 17 September 1987.). The AVHRR (high resolution radiometers) remain semi-operational. Channels 3 and 4 have degraded, but some other onboard monitoring equipment is operational. No a.p.t. (pictures) but the beacon can sometimes be heard on 136.77MHz.

NOAA-11 (Launched 24 September 1988.). The AVHRR is non-operational, but some other units are working. The beacon can sometimes be heard on 137.77MHz.

NOAA-12 (Launched 14 May 1991.). The AVHRR is fully operational, as are most other units.

NOAA-14 (Launched 30 December 1994). As for NOAA-12.

NOAA-K Launch is currently scheduled for spring 1997.

## GOMS Operations

It has finally happened! An 'Info' reader - Peter Schoen of Germany - sent me pictures from

GOMS (the geostationary WXSAT - also known as ELEKTRO - operated by CIS) monitored with his own equipment. Peter tells me that he was 'inspired' by my announcement an edition or two back, of GOMS activities being imminent and decided to try to receive the direct WEFAX transmission. GOMS is positioned over 76°E longitude, and from Peter's home, is only a few degrees above the horizon. The footprint of GOMS barely reaches south-east Britain.

Using a 0.85m dish, pre-amp and 15m cable, Peter led this to a 1.691GHz direct receiver. Because of handling problems (wind resistance) and environmental



impact, he could not use a bigger dish, and it seems this one was too small for good (noise-free) pictures. He therefore bought a TH2 loop Yagi. I bought one of these for my horizon monitoring of GOES-8; they are very manoeuvrable.

Peter was able to confirm reception of GOMS WEFAX most mornings at 6am (Central European Time), and in the evening at 6pm (CET). He has recorded regular transmission of full-disc infra-red imagery, sectored images, "spectacular images from the polar orbiter METEORs 3-5 or 2-21", he said. METEOSAT images, and the GMSA format were also seen. Peter enclosed a set of GOMS

images taken with the dish, of which I have included the whole-disc image dated June 23 at 1630UTC.

I have a copy of the GOMS transmission schedule that shows a selection of formats from METEOSAT (DTOT, CTOT and ETOT), GMS-5 A and B sections, GOMS formats W0 through 4, and METEOR frames M1 through M6. These METEOR frames include part of Europe (as received during direct transmissions - that is, from the WXSAT passing over the ground station) and parts of the western Indian Ocean and Africa. Other frames include parts of the Arctic Eurasian coast (the Northern Passage). GOMS imagery includes W0 (full disc IR) and the four quadrants (W1 through W4).

The schedule was made available through the Internet, by Mr A. B. Uspensky, Director-General of Planeta, a scientific production company.

## Letters

A NOAA-14 picture came from Steve Bonnett of Christchurch. Steve has been using a wide range scanner (the AOR AR-1500 model) for about three years. His interest moved to WXSAT monitoring and he built the Cirkit 137MHz receiver. Steve has a 486PC fitted with sound card, and being a software engineer, he decided to write software to decode the WXSAT telemetry. The resulting program is Windows-based and records a.p.t. signals in WAV format. After the pass, the sound file is converted to a BMP image. The picture shown in Fig. 2 shows Norway and Sweden as captured by Steve's software.

There will be more information on Steve's innovative software in a future column.

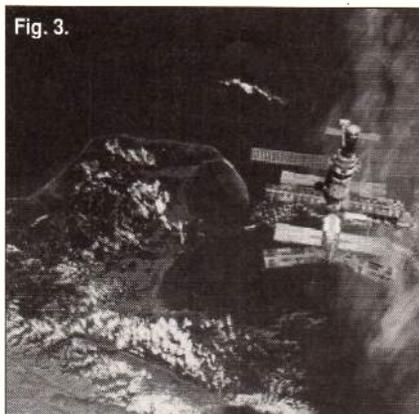


Fig. 1.



## Antenna Adjustments

For WXSAT monitoring the usual antenna configuration is to position a right-circularly polarised crossed-dipole antenna vertically, as high as possible. In such a position, you can expect to receive WXSATs as soon as they come above the local horizon. For moderate cable lengths, particularly when good quality cable is used, an antenna pre-amp may well be unnecessary, and this in turn reduces the level of interference that pager units may give. Such antennas have reasonably good reception characteristics even though the satellite may be quite low. If you are particularly interested in monitoring low elevation passes - and this might be the case if you are keen to monitor passes from the METEORs while they are near the horizon, then one can position a spare antenna so that it points not far above the horizon.

Norman Darnbrough recently raised his antenna by 2m and re-positioned it at a low elevation to the south. He reports better reception from North Africa to Greenland during the whole pass, with little degradation in the north.

## The MIR (Peace) Complex

I am sure that many readers of 'Info' have watched MIR pass over Britain - I never miss an opportunity. Using a satellite tracking program and recent elements, it is not difficult to know when and where to look. During future months I shall provide occasional notes on MIR and its operations. Many operations can be monitored by listening to the voice transmissions on

143.625MHz and other frequencies.

The MIR complex is constructed with six individual modules, designed to provide the essentials - and more - of life. It has four compartments: working, transfer, intermediate and assembly compartments of which only the assembly compartment is not pressurised.

The core section of the station houses the work area comprising

living and operational quarters and is the main habitable section for the crew. The living area contains individual spaces, hygiene areas, the galley (eating area), as well as science equipment, facilities and propulsion. Crew members' cabins contain a chair, sleeping bag and porthole. The personal hygiene area holds a toilet sink and shower, and the galley consists of a table, cooking elements and rubbish storage. To make the station a more natural environment, the complex has distinct floors, coloured walls, carpet on the floor, and a white ceiling with fluorescent lighting. From dark green carpet and light green walls to a living area with soft pastel colours, the station provides cosmonauts with a homely atmosphere. Main engine and fuel tanks are located in the non-pressurised assembly compartment.

## Shuttle - MIR - ISSA (International Space Station Alpha)

In December 1993, an agreement was made between the Russian Space Agency and NASA. From 1995 through to 1997, there will be a series of co-operative flights, whereby Shuttle missions to the MIR space station will take place. For Shuttles to dock properly with MIR, modifications to each of the orbiters have been required. NASA has therefore been upgrading all four orbiters, the refits being carried out by Rockwell. This also gives the orbiters an extended mission capability and prepares them for use with the International Space Station. The programme will provide valuable experience for space station operations (construction of which is scheduled to start in 1997).

Life support and solar panels will be tested with the Mir complex, and problems with ground orientated activities can also be ironed out. Items taken up by the Shuttle will upgrade and extend the operational lifetime of Mir. The missions also see the astronaut exchange programme - US astronauts flying on MIR and cosmonauts on the Shuttle.

The current launch schedule (valid from March 1996) indicates seven Shuttle missions to MIR, all using *Atlantis*, plus the initial rendezvous mission. Mid-September 1996 should see *Atlantis* returning Shannon Lucid to earth during a ten-day mission. The Shuttle will be docked to MIR for five days; astronaut John Blaha will swap places with Lucid and supplies will be transferred.

This Shuttle is scheduled to carry two Spacelab modules for various experiments. STS-81, currently scheduled for 5

December 1996 will see John Blaha return to earth and Jerry Linenger replace him, and then take part in a joint EVA (extra-vehicular - or outside - activity). The Shuttle will carry two Spacelab modules.

These activities should, assuming suitable viewing windows, be visible to a large number of observers due to MIR's high orbital inclination (51.6°). It should make for interesting viewing as for each mission the Shuttle's approach to MIR can be followed. Activity in proximity to the MIR complex itself should be resolvable in binoculars. As always, I shall provide Kepler elements for MIR and the Shuttle as they happen.

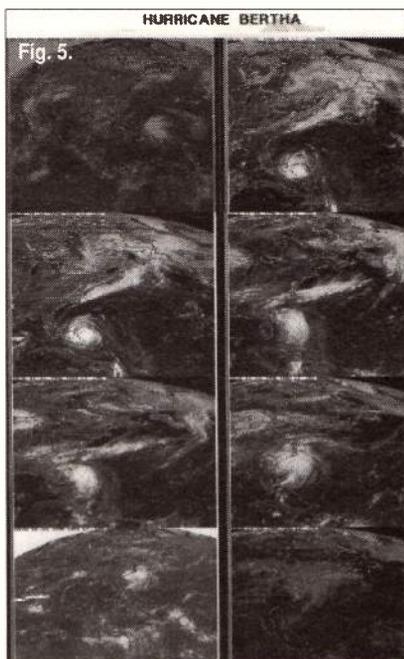
## Amiga and Atari Software

I am grateful to **Olwen Bowen** of Solihull for providing some information on Amiga computers, following my offer of Amiga and Atari satellite tracking software in a previous edition. Olwen tells me that some Amiga software can probably still be purchased from 17BIT in Leeds and via Amiga magazines in the public domain sections. To read PC disks (those that I have offered) Amiga owners require a conversion program, and disk for MS-DOS. Catalogues are available. Since that time, Olwen has graduated to a PC!

## Visitors from Afar

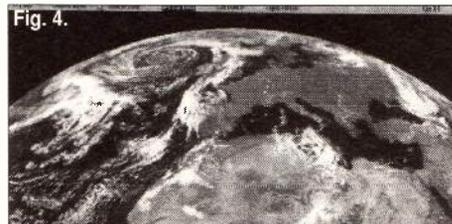
From time to time 'Info' readers visit the south-west of Britain for day trips, and it is not unknown for WXSAT folk to drop in by arrangement.

**Brian Dudman** (of Harrow) was in Plymouth for a few hours, so kindly popped in to deliver a selection of images taken using his fairly extensive monitoring equipment. My wife Marion took a picture of Brian and me in my yard, so when the prints are developed all can be revealed!



Brian left PDUS, WEFAX, NOAA and METEOR images. Where's the OKEAN one then Brian?

I selected Brian's PDUS (Primary Data User Station) image **Fig. 4** because I do not get too many of these, particularly since encryption! For beginners, these are METEOSAT images (usually) carrying the full resolution, as compared to the WEFAX images that contain considerably reduced resolution. PDUS equipment is more expensive, but the main problem is the fact that the large majority of Primary Data images are encrypted, requiring the purchase of a decryption unit. This costs of the order of £500, plus an additional hardware unit before



the images can be properly decoded. Without these additions only a few images are received clearly. It is a great pity that EUMETSAT have done this to METEOSAT images - noting that GOES, GOMS and GMS images are all freely receivable.

## Hurricane Season

The Americas see a succession of hurricanes during the summer months and the one that first made the news was Bertha during the first half of July. I collected one or two images in case I had not received any by press time, but I need not have worried! **George Newport** of Canterbury sent in a set of high quality prints **Fig. 5** showing the evolution and movement of Bertha between July 9 and 13, when it was finally downgraded to a tropical storm.

The images are the LY (infrared) and LZ (visible-light) images originating from GOES-8 WXSAT. These pictures are re-transmitted on METEOSAT-5 Channel 2 (on 1694.5MHz) in the slots labelled LY and LZ on METEOSAT's schedule.

## STS Launch

Shortly after the last press deadline for 'Info', the launch date for STS-79 (the next MIR-Shuttle linkup) was postponed until mid-September. You can receive the first STS elements issued by NASA, from me by using option 1 below.

## Shuttle Tracking Stations

Regardless of which orbital inclination the Shuttle has, several ground stations help maintain constant communications with the astronauts. Here is a list of those involved:

Bermuda, UK (BDA)  
Dakar (DKR)  
Dryden Flight Research Center,

Calif (DFRC)  
Goldstone, Calif (GDS)  
Madrid, Spain (RID)  
Merritt Island, FL (MIL)  
Ponce de Leon, FL (PDL)  
TDRS-3 (TDRS-ZOE) Located at: 275°west  
TDRS-4 (TDRS-EAST) Located at: 41°west  
TDRS-5 (TDRS-WEST) Located at: 174°west  
Wallops Tracking Station (WPS)

The TDRS (Tracking and Data Relay Satellites) are located in geostationary orbit at the positions given.

Next month's 'Info' includes a feature on INSAT - the Indian communications satellite which

carries imaging equipment, and I hope to include an image supplied by K. Narayanan, Programme Director of INSAT at the Department of Space in India.

## Kepler Elements - WXSATs, MIR and Shuttle

Different options are available:

1: For a print-out of the latest WXSAT elements, MIR, and the Shuttle, send a stamped addressed envelope and secured 20p coin or separate, extra stamp. Transmission frequencies are given for operating satellites. This data originates from NASA. During Shuttle operations I send Kepler elements by return-of-post to those requesting them, and I can forward the first active set available. In all cases please enclose a secure 20p coin.

2: I also send monthly (beginning or mid-month) 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 Kepler data as a computer disk file containing recent elements for the WXSATs, and a large file holding elements for thousands of satellites. A print-out is included, identifying NASA catalogue numbers (for the WXSATs, amateur radio satellites, and others of general interest), ideal for automatic updating of your tracking software. Please enclose a secured 50p with your PC-formatted disk and stamped envelope.

## Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz; NOAA-12 transmits a.p.t. on 137.50MHz; NOAA's transmit beacon data on 137.77 or 136.77MHz; METEOR 3-5 (or 2-21) use 137.85MHz; OKEAN-4 and SICH-1 use 137.40MHz; METEOSAT-5 (geostationary) uses 1691 and 1694.5MHz for WEFAX; GOES-8 (western horizon) uses 1691MHz for WEFAX and MIR 145.55 and 143.625MHz.

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# Decode

## All the Data Modes

**R**ichard Coward currently uses an ERA Microreader for his decoding, but is trying to make use of his Acorn RISC-PC. Whilst the Acorn PC handles all his normal Windows/DOS requirements, he has not had any success when trying to run JVFAX. I'm afraid this is a common problem and one I don't have a solution for. The problem stems from the way in which JVFAX and most other decoding packages use the hardware. Whereas most standard PC applications conform to agreed standards and access the hardware via standard routines, this is not the case with decoding systems.

In order to meet the stringent timing demands of decoding data in software, it becomes necessary to interface directly with the hardware. Whilst fine for real PCs, this causes great problems for emulated systems as the hardware is inevitably different. As I said earlier, I'm not aware of a solution but, if you know of a fix, please write and let me know so I can pass-on the details.

**Richard Muirhead** of Salisbury asks what software he should use to receive SYNOPTIC weather information and satellite pictures from around the world. If you're just starting the best option would be to try HAMCOMM and JVFAX. These two packages provide decoding of RTTY SYNOPTIC and h.f. plus v.h.f. FAX pictures at minimum cost. If you subsequently decide to get serious you can then upgrade to one of the many commercial decoding packages on the market.

### Receiver Control Software

**Geoff Childs** has sent me a beta (pre-release) version of a brand new and very impressive receiver control package. The new program is called RCON and is being handled by Lowe Electronics. With so many varied packages on the market, it's good to see a new entry that has taken a fresh approach to the problem. RCON has been designed to operate under Windows 3.1 or '95, so is only available for PCs. The systems requirements are fairly conventional and demand a 386 or better processor with 4Mb of RAM, colour display, SoundBlaster compatible sound board and 6Mb of hard disk space. Inclusion of a CD-ROM will

facilitate integration of the *Klingenfuss Super Frequency List*. RCON comes with its own installation routine to automate the installation whilst still giving the operator the choice of final drive and directory.

In its beta form RCON provided comprehensive drivers for the Lowe HF-150, HF-250, AOR AR-3000A, AR-5000, AR-8000 and the NRD-535 receivers.

Communication with the receivers is through the standard PC COM port and the program could be set to use any one of ports 1 to 4.

Once installed and receiver connected, RCON starts with a very comprehensive and self explanatory screen display as shown in **Fig. 1**. The bottom half of the display is used to show all the receiver controls, whilst the upper section gives access to some of the more advanced features. Even the basic receiver controls have been enhanced with useful features that are not available in the real receiver. A good example of this is the scanning functions added to the HF-150 that enable sequential scanning of memories or a search of a band in pre-set frequency steps. This search is further enhanced with a logging search where all active frequencies found during the search are automatically stored in a disk file. This feature can be a great time saver when exploring new bands as the operator just has to review and edit the end result.

To supplement the extensive control functions, RCON includes a Microsoft Access database engine that can be used to drive a number of relational database applications. Not only does this facilitate the integration of other databases, but it means that the powerful SQL query language can be used to interrogate the databases. RCON is supplied with four ready-made queries, a good example of which is its ability to show all broadcast stations that are scheduled to be active in the next half hour. For operators with some expertise in SQL queries, RCON allows 'free-form' requests so that you can generate your own specialised queries.

For utility listeners an important feature of RCON is its ability to use the *Klingenfuss Super Frequency List* on CD-ROM. Not only can it recall frequencies,

but it can also extract the mode and transfer the information to your receiver. This was very impressive and transformed use of the *Klingenfuss Frequency List*. The only problem noted was a rather sluggish response, but this was probably due to my double speed CD-ROM - I'm sure one of the newer quad or six times devices would improve the performance.

From the features listed so far you will not be surprised to learn that RCON includes an impressive range of enhanced memories. The memories are effectively unlimited as they can be downloaded from the receiver and stored to hard or floppy disk. RCON also provides an impressive range of memory management facilities that let the operator manipulate and tidy-up the receiver's memories. This is extremely valuable for receivers with large memories and I know from experience that these can get in a mess very quickly. You can, of course, transfer station information from the frequency databases into the receiver's

the receiver to a custom front panel display with all the receiver's features available at the press of a button. You could even tune by rotating the main tuning knob!

In summary, RCON is a very comprehensive receiver control package that appears to be very well implemented. I particularly liked the excellent memory management and database systems.

For more details please contact **Lowe Electronics, Chesterfield Road, Matlock, Derbyshire DE4 5LE. Tel: (01629) 580800**. My thanks to Geoff Childs for supplying the review version.

### Frequency Standards

One of the utility transmission systems that I rarely comment on is the standard frequency transmissions. Whilst these signals are not the most interesting to listen to, they can be used to support your utility listening. In addition to being used to check the basic frequency calibration of your receiver, they can be used to measure frequency stability, align FAX timebases, run filter checks and accurately set the time on your PC. To help you get the best from these, often neglected transmissions, I'll run through each of the systems in some detail.

For listeners in the UK and Europe there are two main sources of standard frequency transmissions, WWV and MSF. Let's start with the UK based MSF transmissions. If you're a regular user of the M1 motorway you will no doubt have seen the large antenna farm at Rugby. In amongst this farm is the main antenna system for the 60kHz transmissions from MSF Rugby. So why MSF? This is the callsign for the station and originated from SF being selected to represent Standard Frequency. The M was chosen simply because it was the only letter allocated to UK callsigns that was available at the time! The station is located near Rugby and operates on 60kHz with a frequency accuracy of  $\pm 3$  parts in  $10^{12}$ . The radiated power is some 16kW and it's operational 24hrs a day with the exception of a 4 hour maintenance break between 1000-1400UTC on the first Tuesday of every month. The

Fig 1: RCON Main Display.

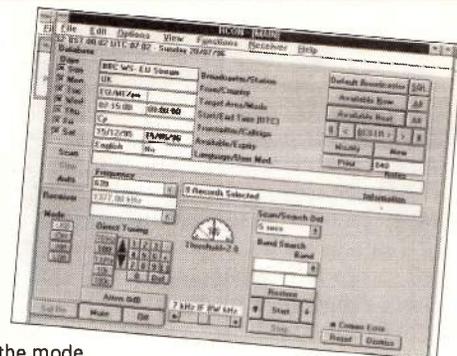
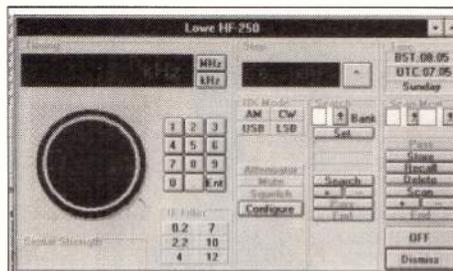


Fig 2 : RCON Monitor Mode.



memories. As if all this wasn't enough, RCON includes a facility to record audio from the receiver onto the computer's hard disk. The system is designed to handle sound clips rather than complete programs, but can be very handy for storing station IDs. If your receiver includes an S-meter where values can be communicated through the serial port, RCON can produce a spectrum analyser display. This is very effective for checking band activity and can be set-up to display any frequency range with user defined frequency increments.

To supplement all these impressive features RCON includes what's known as a Monitor mode (**Fig. 2**). When activated, the display changes from the generic representation of

format of the signal is very simple with the carrier dropped every second for 100ms that extends to 500ms at the minute. The precise start of the second/minute is the point at which the carrier drops.

To generate the accurate carrier and timing signals the MSF transmitter uses a Caesium beam plus two rubidium vapour sources manufactured by Hewlett Packard. The output is a 5MHz signal from a crystal oscillator that forms part of the feedback system controlled by the clocks. This is further processed to give a 15MHz signal that's then divided by 250 to produce a 60kHz square wave. When listening to the signal from Rugby you will note that there appears to be data sent from time to time.

These data bursts contain information on the current time and date and can be decoded using commercial or home built units. If you want to take advantage of the highly accurate time from the National Physics Laboratory (NPL) you can download a small MSDOS program from their FTP server that will dial-up their TrueTime service, download the time and reset your PC's clock. The Internet address for the FTP site is <ftp://ftp.ess.npl.co.uk/pub/software/msdos/truetime> The program comes as a self extracting archive with it's own documentation and installation files. If your modem is connected to COM1 it should work first time.

Another source of standard frequencies is the group of transmitters operated by the US National Institute of Standards and Technology (NIST). The three stations have the callsigns WWV,

WWVH and WWVB. the most well known of these is WWV and this station has been operational since March 1923! The station operates on 2.5 and 20MHz with a power of 2.5kW and on 5, 10 and 15MHz with 10kW output. WWVH has been running since November 1948 and radiates 5kW on 2.5MHz plus 10kW on 5, 10 and 15MHz. The final station, WWVB operates on v.l.f. with 13kW at 60kHz. The WWV transmission format is rather different to Rugby as it runs to an hourly schedule with a mix of tones data and voice announcements.

Now that you have some background knowledge of the stations, let's see how their data can be used to support utility listening.

One of the most valuable applications is to help you set-up your FAX program's timebase. Accurate timing is absolutely essential for FAX reception. If this is not set correctly, you will find that the received pictures are received with a slant. Whilst you can set the reference oscillator with a live FAX signal, you have to be sure you pick a good one!

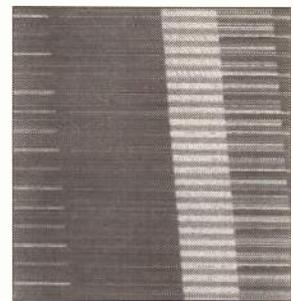
A simple way around this problem is to use the MSF Rugby transmission as the reference then you know you're right! To do this, set your FAX program to a drum speed of 120 r.p.m. with an IOC of 576, i.e. the normal setting for weather FAX signals. Now set your receiver to u.s.b. and tune to 60kHz and carefully adjust the tuning so that the 60kHz carrier is just above pure black. Once you've set this up you should start to receive a regular pattern similar to that shown in **Fig. 3**. You will, of course, have noticed that **Fig. 3**

shows a pronounced slant caused by an incorrect setting of the reference timebase! You now need to let the program run until you can see whether or not you have a timing problem. If you have a problem, refer to your decoder's instruction on how to alter the reference timebase.

In programs such as JVFAX you have to alter a number in the configuration screen. This doesn't alter the crystal oscillator in the PC it simply adjusts a correction factor that's used by the software, so it won't effect any other programs. If you're using JVFAX, I would recommend adjusting the correction factor in increments of 20 units at a time. Once you think you have the timing right, try using the Rotate command to place the vertical line of the Rugby signal very close to the edge of the screen. You can now leave the receiver to run for several minutes to see if you really are right. Although the timing correction can be saved with most programs, you will find you need to repeat this set-up process from time to time to compensate for ageing of the PC's crystal oscillator.

The RTTY operator can use the standard frequency transmissions for a number of checks. One of the most useful is to check the RTTY tuning offset for a particular receiver. To do this set your receiver to u.s.b., start your RTTY program with the tuning indicator displayed. If you're using HAMCOMM select the spectrum display (**Fig. 4**). Now fine tune the receiver until the tuning display indicates a Mark (lower frequency). Once you're sure you're accurately tuned to the Mark the difference between the displayed frequency and the frequency standard is the tuning off-set you need to use when tuning to RTTY station using the listed frequency. Once measured this off-set remains constant throughout the h.f. bands, regardless of the shift used by the transmitting station.

The highly stable frequency standards of these stations can also be used to check the stability of your receiver. A particularly good way to do this is to use Hamcomm set to spectrum display. Press PageUp to zoom the display to maximum resolution and press + to toggle the display to shadow mode. Next tune to any one of the standard frequency transmissions and fine tune the receiver to align the carrier with one of the marker lines. You can now leave the system running for as long as you want to check the stability. With Hamcomm set-up in this way the blue shadow will show the extent of any frequency drift, whilst the yellow lines will show the current



**Fig 3 : Fax Alignment Signal From Rugby.**

position. This is a very useful test as it's quite common for receiver's to wander up and down in frequency rather than a straightforward drift in one direction.

The set-up for frequency stability using Hamcomm can also be used to check the frequency response of your receiver or any add-on audio filters. To do this you use the receiver's tuning control to alter the frequency of beat note from the standard frequency transmission. As you move towards the edge of the receiver or filter's passband the height of the Hamcomm display will reduce in proportion to the attenuation. By noting the response against the frequency scale at the bottom of the display you can measure the response. However, you need to be aware that this is only a fairly crude (but useful) measure and cannot be used to compare equipment against the manufacturers specification.

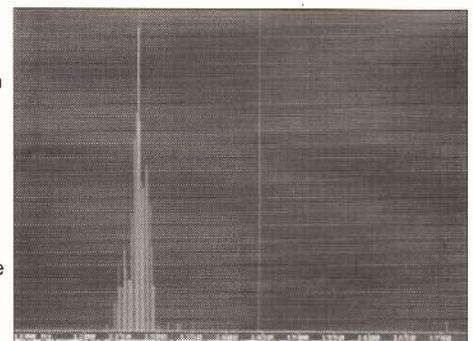
That just about completes this run through a few ways to use standard frequency transmissions.

## Complex Frequencies

For this month's listing I've taken a selection of frequencies from **Day Watson's** latest Complex List. The format is slightly different to my normal list, so here's a brief run-down on the layout. All

frequencies are in MHz and the mode field breaks down as follows:

ARQ/E/96/I/170 = ARQ/E mode using baud rate of 96 with the data



**Fig 4 : Hamcomm Spectrum Display.**

inverted (I) and a shift of 170Hz.

The term UNID. simply means unidentified, if you can help with more information please drop me a line and I will pass the details to Day.

Freq	Mode	Time	Station
5.0248	ARQ/E/96/E/85	1607	LKA STUTTGART (BW)
5.144	PACT//	1615	ICRC BOSNIA
5.160	ARQ/342/96/I/400	0009	NIAMEY AIR (5UA)
5.2215	ARQ/342/96/I/400	2250	COTONOU AIR (TYE)
5.357	ARQ/E/72/E/170	1419	UNID.
5.371	FEC/A/96/E/170	1538	TUNISIAN NAT GUARD NET
5.8625	ARQ/E/72/E/400	2135	UNID.
6.9638	ARQ/E/192/N/170	2308	UNID.
7.3507	COQ/8/26.6/-/-	1358	MFA ALGIERS
7.524	ARQ/342/96/E/400	2256	COTONOU AIR (TYE)
7.5645	ARABIC/50/N/400	1820	INA BAGHDAD (YIX75)
7.596	ARQ/342/96/I/400	1834	NIAMEY AIR (5UA)
7.622	ARQ/POL//100/E/250	0759	MFA WARSAW (SNN299)
7.760	3SC/50/R/1000	0828	ARKHANGELSK MET (RGH77)
7.815	FEC/A/VFT	1419	UNID.
10.1132	ARQ/242/200/N/400	0647	UNID.
10.1609	PACT//100/-/200	1530	UNID.
10.4225	ARQ/S/96/-/200	0743	MFA VIENNA
10.9937	COQ/8/13.3/-/-	2102	ALGERIAN EMB HAVANA
10.9937	COQ/8/13.3/-/-	1916	UNID. ALGERIAN
12.1493	ARQ/342/96/E/340	1708	UNID.
12.577	GMDSS//100/E/170	1238	LYNGBY RADIO (OXZ)
13.419	ARQ/E/288/N/200	1249	BNDVB BONN (6XM8)
13.4257	COQ/8/26.6/-/-	1422	MFA ALGIERS
13.4386	FEC/A/96/E/400	1004	PIAB BONN (DG43H1)
13.541	PACT//	1943	UNID.
13.5437	ARQ/E3//192/E/400	0718	FF LIBREVILLE (RFTJD)
13.8758	ARTRAC/125/N/170	0728	MFA BUDAPEST (HGX21)
14.447	ARQ/E/96/N/850	0656	SJSMI UNIDINE (WJ1) ?
14.593	PICC/VFT	1756	UNID.
14.681	FEC/ROU//164.5/R/400	1103	MFA BUCHAREST [V5G]
14.699	ARABIC/50/N/400	0646	INA BAGHDAD (YIX70)
15.9465	TWINPLEX//100/-/-	1113	MFA MADRID
16.2736	COQ/8/26.6/-/-	1420	MFA ALGIERS

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*Data Processor.....	£7.00	Temps QNH.....	£7.00
QSLD Base.....	£6.00	*Weather Decoder.....	£9.00

\*A RTTY decoder with ASCII output is required to use these programs. Prices include P&P. Payment by Cheque or PO. SAE for full list and program details.

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# LW Maritime Beacons

## Long Wave Maritime Radiobeacon Chart

During April, May and June some listeners were prepared to search the band well into the night for the sky waves from distant beacons. Most who did so were not disappointed!

Extensive logs were compiled at night by **Robert Connolly** (Kilkeel) and **Peter Rycraft** (Wickham Market) and some remarkably distant beacons were noted therein - see chart. Robert noticed that the beacon at Jaroslawiec, Poland (JA) is now operating on 295.0 instead of 287.3kHz. Peter logged five beacons which he had not heard before, namely Cabo Caroeiro, Portugal (CV) on 287.5; Port en Bassin, France (BS) 290.0; Vila Real, Portugal (VR) 303.4, Genova, Italy (GV) 310.5; also Scoresbysund, Greenland (SC) 343.0.

An impressive first report was also received from **Dave Dawson** in Birmingham. He used a Drake SPR4 receiver with a loop and searched the band mainly at night. At 0026 on April 1 he heard the beacon at Prinz Christian Sund, Greenland (OZN) on 372.0.

Particularly good conditions were noted during the evening of May 31 by **Albert Moore** (Douglas, IoM). At 2100UTC he heard the ident (TL) from the Punta del Penna Lt, Italy on 314.5kHz, Much to his surprise the beacon at Capo Sandalo, Sardinia (IP) on 310.0 became audible at 2115.

Frequent checks were made during daylight and after dark by some listeners. The early hours of June 11 were noted as particularly good by **Brian Heath** in Stapleton. **Eric Tubman** (Whitstable) found that only two extra beacons were audible at night, namely Porkkala, Finland (PR) 284.5 and St.Catherines Pt. IoW (CP) 293.0. Along in Shoreham-by-Sea **Ross Workman** was unable to hear some of his regulars. Up in Edinburgh **Kenneth Buck** logged the Faeroese beacons at Akraberg (AB) and Nolso (NL) at 0200UTC!

The ground waves from a large number of beacons were detected during daylight by some listeners. **John Woodcock** (Basingstoke) was surprised by the lack of static during the fine weather, however a severe thunderstorm and whirlwind hit the area on June 7th!

The third edition of Robert Connolly's comprehensive guide to the beacons is spiral bound and opens flat, so it is easy to use when searching the band. If you would like an information sheet about it please write to him via me enclosing an s.a.e.

Freq (kHz)	C/S	Station Name	Location	DXer	Freq (kHz)	C/S	Station Name	Location	DXer
284.5	LZ	Lizard Lt	S.Cornwall	A,B,C,D,E,F,G,H,I, K*,M,P,Q,R	301.0	ER	Eierland Lt	Holland	C*,H,K*
284.5	MA	Cabo Machichaco	N.Spain	C*,D*,F*,H,J*,K*,L,R*	301.1	RD	Raufarhoefn	Iceland	C*,L,M
284.5	PR	Porkkala	Finland	D*,N*	301.5	KG	Kinnards Hd Lt	NE.Scotland	A,C*,F,H,M
285.0	NO	Cabo de la Nao Lt	S.Spain	C*,D*,F*,H,J*,R*	301.5	LB	Torre de Hercules	N.Spain	C*,K*
285.0	NP	Nieuport W.Pier	Belgium	C*,K*	301.5	OL	Hoburg	Sweden	C*,K*
286.0	TR	Tuskar Rock Lt	S.Ireland	A,C,D*,E,F*,G,H,I, K*,M,P,Q,R*	302.0	RB	Cherbourg Ft W Lt	France	C,D*,E,F,G,H,I,J*, K*,M,P,Q,R
286.5	AL	Almagrundet Lt	Sweden	C*,K*	303.0	DB	Rota	SW.Spain	C*,E
286.5	BY	#Baily Lt	S.Ireland	C,H	303.0	FD	Flamborough Hd Lt	Yorkshire	A,C,D*,E*,F,H,J*,K*,N,R
286.5	FI	Cala Figuera	Majorca	C*,D*,F*,H*,J*,K*	303.0	FV	Falsterborev Lt	Sweden	A,C*,H*
286.5	FT	Cap Ferret Lt	W.France	C*,F*,H*,J*,K*,R*	303.0	MY	Myggenaes Lt	Faeroes	K*
286.5	NK	Inohkeith Lt	F of Forth	A	303.0	YE	Ile d'Yeu Main Lt	France	C*,J,K*,R
287.3	BT	Bjargtangar Lt	Iceland	C*	303.4	VR	Vila Real	Portugal	K*
287.3	HA	Haifa Lt	Israel	C*	303.5	BJ	Bjornund Lt	Norway	A,C*
287.3	IB	I.Berlienga	Portugal	C*,K*	303.5	FN	Feistein Lt	Norway	A,K*
287.3	LE	Laba Rear	Poland	C*	303.5	IA	Llanes Lt	N.Spain	C*,D*,H*,K*,R*
287.3	MD	Cabo Mondegor	Portugal	K*	303.5	VL	Vlieland Lt	Holland	C*,E*,F,H,I,K*,L,M,N,Q
287.5	CV	Cabo Carvoeiro Lt	Portugal	K*	304.0	PS	Pt Lynas Lt	Anglesey	A,C,D*,E,F,H,J*, K*,L,M,O,P,R*
287.5	DO	Rosedo Lt	France	C*	304.5	MY	Cabo Mayor Lt	N.Spain	F*,J*,K*,R
287.5	FR	Faerder Lt	Norway	C*,K*	305.0	BA	Estaca de Bares	N.W.Spain	L,R
287.5	MD	Cabo Mondego	Portugal	C*	305.0	FP	Fife Ness Lt	SE.Scotland	A,C*,F*,H,M
288.0	HH	Hoek van Holland	Holland	K*	305.0	GL	Ile de Giraglia Lt	Corsica	C,L
288.0	KL	Sklinna Lt	Norway	C*,K*	305.5	AL	Pt d'Ailly Lt	France	C,D*,E,F,G,H,I,J*, K*,M,N,P,Q,R
288.0	OH	Old Hd of Kinsale	S.Ireland	C*,D,H	305.7	DA	Dalatangi Lt	Iceland	C*
288.5	FI	Cabo Finisterre Lt	N.W.Spain	C,D*,H,K*,R*	306.0	EC	Elizabeth Castle	Jersey	K*
288.5	UD	Cabo Salou	S.Spain	K*	306.0	FN	Walney Is Lt	Off Lancs	A,C,D*,F,H,J*, K*,M,O,P,Q
288.5	YM	Ijmuiden Lt	Holland	C*,E*,F*,K*,M	306.0	TN	Thyboron	Denmark	A,K*
289.0	BL	Butt of Lewis Lt	Is of Lewis	F	306.5	GJ	Le Grand Jardin Lt	France	R*
289.0	BY	Baily Lt	S.Ireland	A,C,H,K*,L	306.5	KL	Kolkasrags	Latvia	C*,L*
289.5	LO	Landsort S Lt	Sweden	C*,L	306.5	OR	O.Osmussaar	Estonia	C*
289.5	MN	Hammerodde	Denmark	C*,H,K*,L*	306.5	RS	Ristna	Estonia	C*,H*
289.5	SN	Ile de Sein NW Lt	France	C*,F,H,K*,M,P,R	306.5	OR	Ristna	Estonia	C*,H*
290.0	AV	Aveiro	Portugal	C*	306.5	UT	Utsira	Norway	A,C*,D*,E*,F,H,K*,L,R*
290.0	BS	Port en Bassin Lt	France	K*	307.0	GL	Eagle Is Lt	Ireland	A,C,H,K*,L
290.0	FD	Fidra Lt	F of Forth	A,C*,H	308.0	RC	Cabo Roca	Portugal	C,K*
290.0	MR	Montedor	Portugal	C*	308.0	RD	Rocoes Douvres Lt	France	C*,J*,K*
290.5	DY	Duncansby Hd Lt	NE.Scotland	C*	308.5	NZ	St Nazaire	France	C*,H*,K*,L,P,R
290.5	LL	Hallo Lt	Sweden	C*,K*	309.0	MU	Kobenhaven	Denmark	C*
290.5	SB	S.Bishop Lt	Pembroke	A,C,D*,E,F,G,H,K*,M,P,R	309.5	BA	Punta Estaca Bares	N.Spain	C*,D*,F*,H,K*
290.5	VI	Cabo Villano Lt	N.Spain	C,D*,E*,F*,H*,K*,L*,R	309.5	FW	Fruhulmen Lt	Norway	C*
290.5	VY	Visby	Sweden	K*	309.5	MA	Marstein Lt	Norway	A,C*,E*,H*,K*
291.0	CF	Capo Ferro	Sardinia	F	309.5	PB	Portland Blt Lt	Dorset	C*,D*,F,G,H,K*,M,P,Q,R
291.0	OR	Orskar Lt	Sweden	C*,K*	310.0	ER	Pt de Ver Lt	N.France	C*,E*,G,H,I,K*,M,P,Q,R
291.0	SN	Cabo San Sebastian	S.Spain	C*,F,H*	310.0	IP	Capo Sandalo Lt	Sardinia	H*,K*
291.5	SU	South Rock LV	Co.Down	A,B,C,D*,E,F,H,J*, K*,L,M,P,Q,R	310.3	GV	Goltur	Iceland	K*
291.9	LT	La Isleta	Canaries	C*	310.5	SG	Sjaellands N Lt	Denmark	C*,K*
291.9	NA	Punta Lantaila	Canaries	C*	311.0	GD	Girdle Ness Lt	NE.Scotland	A,C,L
292.0	MH	Mahon, Minorca	Balearic Is	C*	311.0	NF	N.Foreland Lt	Kent	D,E*,F,G,H,I,J*, K*,L,M,N,P,Q,R
292.0	SJ	Souter Lt	Sunderland	A,B,C,D*,F,H,J*, K*,M	311.5	LP	Loop Hd Lt	S.Ireland	C,H,L
292.5	SM	Pt St.Mathieu Lt	France	B,C,D*,E,F,G,H,I, K*,M,P,Q,R	312.0	OE	Oostende	Belgium	C*,E,F,I,K*,N,P
293.0	CP	St.Catherine's Lt	I.O.W.	D*,E*,F,G,I,J*, K*,M,N*,P,Q,R	312.0	UH	Eckmuhl Lt	France	C*
293.0	RN	Rhinns of Islay Lt	Is of Islay	A,C,H,L	312.5	AK	Akmenrags	Latvia	C*
293.0	SY	Svinoy Lt	Norway	C*,K*	312.5	BT	Baltvisk	Russia	C*
293.5	RO	Cabo Silleiro Lt	N.Spain	C*	312.5	SK	Mys Teran Lt	Russia	C*
294.0	KU	Kullen High Lt	Sweden	A,C*,H*,K*	312.5	CS	O.Dikson	Arc.Russia	E,E*
294.0	PH	Cap d'Alparch	France	C,D*,E,F,G,H,I,J*, K*,M,N,P,Q,R	312.5	CM	Calais Main Lt	France	C*,E,F,K*,N,P
294.5	BA	#Black Hd Lt	N.Ireland	C*	312.5	DB	Doobskiy	Ukraine	C*
294.5	KC	#Old Hd of Kinsale	S.Ireland	C*	312.5	KA	Ktelpede Rear Lt	Lithuania	C*,E
294.5	PS	#Pt.Lynas Lt	Anglesey	C,F,H,L,P	312.5	LR	Liepaja	Latvia	C*
294.5	PT	#Souter Lt	Durham	A	312.5	SB	Skardfjara	Iceland	C*
294.5	UK	Sunk Lt V	Off Essex	D*,E,F,I,K*,N,P,R	312.5	VS	Cabo Estay Lt	N.Spain	J*,K*,P
295.0	JA	Jaroslawiec	Poland	C*,D*	312.6	SM	Skagata Lt	Iceland	F*
295.0	SN	Sietnes Lt	Norway	C*,K*	313.0	HA	Halten Lt	Norway	K*
295.5	CB	La Corbiere Lt	Jersey C.I.	C*,K*	313.0	PA	Cabo de Palos Lt	S.Spain	C*,H*,J*,R
295.5	CR	Cap Couronne	France	C*,K*	313.0	TY	Tory Is Lt	N.Ireland	A,C,H,L
295.5	RE	La Rochelle	France	C*,F*,M,Q,R	313.5	TR	Cap Bear Lt	S.France	C*,D*,F*,H*,R*
295.5	BH	Blavandehuk Lt	Denmark	C*,K*	313.5	CM	Cromer Lt	Norfolk	A,D*,E*,F,H,J*, K*,M,N,P,Q,R
295.5	GR	Goeres Lt	Holland	C*	313.5	WB	Weaver Pilot V.	Germany	C*
296.0	BH	Blavandehuk Lt	Denmark	A,C*,F*,H,K*	314.0	HK	Hekkingen Lt	Denmark	H*,K*
296.0	KN	Skrova Lt	Norway	K*,L,M	314.0	PQ	Porquerolles	S.France	H*,K*
296.0	FG	Pt de Barfleur Lt	France	C*,D*,E*,F,G,H,I,J*, K*,L,M,N,P,Q,R	314.0	VG	Ile Verge Lt	France	C,D*,E*,F,G,H,J*, K*,M,P,Q,R
297.0	MA	Mantyluoto	Finland	H*	314.5	SK	Strandhofn	Iceland	C*
297.5	MK	Mys Mikulkin	SSR Arctic	C*	314.5	ND	Punte D.Penna	Italy	C*,D*,F*,H*,K*
297.5	PS	Cabo Penas Lt	N.Spain	C*,F*,H*,K*,L	315.0	TL	Niddan	Lithuania	C*
298.0	GX	Ile de Groix	France	C*,H*,K*,L	316.0	IN	Ingolfshofdli Lt	Iceland	C*,H*
298.0	TA	Cabo Gata	S.Spain	C*,H*,K*,L,M,Q,R	318.0	LEC	Stavanger	Norway	A,C,D*,E*,F,G,H,J*, K*,L,M,N,P,Q,R*
298.5	RR	Round Is Lt	Is Scilly	A,C,D*,E*,F,G,H,I,J*, K*,L,M,P,Q,R	343.0	SC	Scoresbyund	Greenland	C*
298.5	SW	Skagen	Denmark	C*,K*	357.0	JV	Jakobhavn	Greenland	K*
298.5	HO	Hornbjerg	Iceland	C*	372.0	OZN	Prins Chris's Sund	Greenland	C*,D*,H*
299.0	AD	Ameland Lt	Holland	A,C,H,J*,K*	381.0	AB	Akraberg	Faeroes Is	A*,C*,D*,E*,H*,K*,R*
299.0	BN	Les Balesines	W.France	C*,K*	404.0	NL	Nolso	Faeroe Is	A*,C*,H*,K*
299.0	UN	Understen Lt	Sweden	C*,K*					
299.5	NP	Nesh Pt Lt	S.Wales	C*,D*,E,F,G,H,I, K*,M,P,Q,R					
299.5	SK	Skomvaer Lt. Roat	Norway	C*					
299.5	VR	Utvaer Lt	Norway	A,C*,H,K*					
300.0	MZ	Mizan Head	S.Ireland	C*,H,K*					
300.0	TI	Cap d'Antifer Lt	N.France	G,I,K*,M,Q,R					
300.0	DU	Dungeness Lt	Kent	E,F,G,H,I,J*, K*,M,N,P,Q,R					
300.5	LA	Lista	Norway	A,C*,D*,D*,H,K*					
301.0	CA	Pt de Creach	France	C,H					

# LM&S

## Long, Medium and Short Waves

**H**heavy rain and thunderstorms often occur after prolonged periods of fine weather. Every time a lightning discharge occurs electromagnetic radiation that covers a wide band is generated. The emissions produced by a distant storm may be detected with a radio receiver as 'atmospherics', especially at low frequencies.

During a local thunderstorm the electromagnetic energy can easily destroy the front-end transistor(s) of a powered receiver, so at the first rumble switch off!

When rain falls from an electrified cloud each droplet carries a charge. Those that fall on an outdoor antenna gradually build up a charge on it. If no easy path to earth exists a very high potential can build up and a hiss or distinct crackling noise may arise where it discharges to earth. Always earth an antenna before a storm or when not in use.

### 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 June.

Sky waves from the Radiotelevisione Italiana (RAI) 10kW outlet at Caltanissetta, Italy on 189kHz were received at dusk on two occasions by **Fred Pallant** in Storrington. On June 12 he logged them as SINPO 13342 at 2102UTC and on the 27th as 14342 at 2114.

### Medium Wave Reports

Very few of the broadcasts from m.w. stations in E.Canada and E.USA reached the UK at night during June. On the 2nd **Tony Stickells** (Thornton Heath) logged WNRB in Boston, MA on 1510kHz as 24223 at 0133 and CJYQ in St.John's, NF on 930 as 21112 at 0137. Despite frequent checks **Harry Richards** (Barton-on-Humber) could find no trace of them until June 22, when he picked up a clear ident from WNRB at 0110. Their transmission rated 32222. The only other report came from **John Slater** in Scalloway, Shetland. At 0115 on June 25 he received a few odd bursts of a broadcast from CJYQ, which at best peaked SIO222.

In contrast, the sky waves from a number of stations in the Middle East and N.Africa arrived here after dark - see chart. Whilst searching the band in the early hours of June 2 Tony Stickells picked up a

broadcast from JRTV via their 2MW outlet at Ajlun, Jordan on 801. It peaked 41332 at 0104 and he was able to detect it for about half an hour. **George Millmore** (Wootton, IoW) found reception from N.Africa to be quite good most nights. At 2330 on June 17 he logged Santah, Egypt on 864 (500kW) as SIO444.

The new ILR 'Asian Sound Radio' outlets on 963 and 1377kHz are reaching some distant places! Up in Galashiels **Ross Lockley** is able to receive the ground waves from both of them during the morning. Over in Co.Down, **Robert Connolly** (Kilkeel) logged their transmission on 963 as 33333 at 1630.

### Short Wave Reports

Owing to the sunspot minimum period the **25MHz (11m)** band is unlikely to be used for broadcasting in 1996.

The propagation conditions in the **21MHz (13m)** band vary daily. Sometimes R.Australia's broadcast to Asia via Darwin on 21.725 (Eng 0630-1100) has reached the UK. It was noted as SINPO 14321 at 0854 by **Tim Allison** in Middlesbrough; 'very poor' at 0915 by **Norman Thompson** in Oadby; 15221 at 1000 by **Eric Shaw** in Chester.

Also noted before noon were DW via Wertachtal? 21.680 (Eng to S.E.Asia 0900-0950), rated 22222 at 0910 by **Thomas Williams** in Truro; BSKSA Saudi Arabia 21.495 (Ar [Holy Quran] to S.E.Asia 0900-1200) 35343 at 0938 by **Richard Reynolds** in Guildford; RFI via Issoudun 21.620 (Fr to E.Africa 0800?-1300) 25433 at 1015 in Chester; UAER, Dubai 21.605 (Eng to Eur 1030-1555) 35433 at 1040 by **Simon Hockenhill** in E.Bristol.

After mid-day, RCI via Sines, Portugal 21.455 (Eng to Eur, M.East, Africa 1330-1400) was rated 55555 at 1333 by **Ron Damp** in E.Worthing; RFI via Allouis? 21.580 (Fr to Africa 1100-1600) 23322 at 1335 in Kilkeel; UAER, Dubai 21.605 (Eng to Eur 1330-1355) 25442 at 1330 in Galashiels; R.Portugal via Sines 21.515 (Port, Eng to India, M.East 1400-1600 Mon-Fri) 24222 at 1445 in Scalloway; RAI Rome 21.520 (Tt to Africa [Home svce relay] 1410-1700, Sun only) 45444 at 1500 in E.Bristol; BBC via Ascension Is 21.490 (Eng to S.Africa 1500-1630) 24332 at 1505 by **Rhoderick Illman** in Oxted; BBC via Ascension Is 21.660 (Eng to W/E/S.Africa 1100-1700) 35533 at 1540 by **David Edwardson** in

### Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	H* I
153	Donebach DLF	Germany	500	B* C,D* F* G,H,J,K,M
153	Bod	Romania	1200	F*
162	Allouis	France	2000	A* B* D* E* F* G,H,I,J,K,L,M
171	Nador Medi-1	Morocco	2000	H* K*
171	B'shakovo etc	Russia	1200	F* G,H,J
177	Oranienburg	Germany	750	B* F* G,H,J,K*
183	SaarLouis	Germany	2000	B* D* E* F* G,H,I,J,K,L,M
189	Caltanissetta	Italy	10	H*
198	BBC R-4 via ?	UK	?	A* B* D* E* F* G,H,I,J,K,L,M
198	R.Mayak via?	Russia	150	F*
207	Munich DLF	Germany	500	B* C* D* G* F* H,J,K,L,M
207	Azilal	Morocco	800	C* H* J*
216	Roumoules RMC	S.France	1400	C* D* F* G,H,I,J,K
225	Raszyn Resv	Poland	?	B* C* D* F* G* H* J* K* M
234	Beidweiler	Luxembourg	2000	A* D* E* F* G,H,I,J,K,L,M
234	Ark'gelsk etc	Russia	500	F*
243	Kalundborg	Denmark	300	C,D,E* G,H,J,K,L,M
252	Tipaza	Algeria	1500	E* G* H* J* K* M
252	Atlantic 252	S.Ireland	500	A* B* D* E* F* G,H,I,J,K,L,M
261	Burg(R.Ropa)	Germany	200	G,H,J,K
261	Taldom Moscow	Russia	2500	B* D* J
270	Topolna	Czech Rep	1500	A* D* E* G* H* J* J* M
279	Minsk	Belarus	500	D* F* G* H*

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

#### Listeners:-

- |                                  |                                    |                                     |
|----------------------------------|------------------------------------|-------------------------------------|
| (A) Paul Glover, Worthing.       | (E) Stephen Jones, Oswestry.       | (J) Tony Stickells, Thornton Heath. |
| (B) Ted Harris, Manchester.      | (F) Eddie McKeown, Newry.          | (K) Andrew Stokes, Leicester.       |
| (C) Simon Hockenhill, E.Bristol. | (G) George Millmore, Wootton, IoW. | (L) Norman Thompson, Oadby.         |
| (D) Sheila Hughes, Morden.       | (H) Fred Pallant, Storrington.     | (M) Phil Townsend, E.London.        |
|                                  | (I) Tom Smyth, Co.Fermanagh.       |                                     |

Wallsend; BBC via Limassol, Cyprus 21.470 (Eng to E.Africa 1300-1700) SIO443 at 1619 by **John Eaton** in Woking; R.Japan via Moyabi, Gabon 21.700 (Jap to Eur, M.East, Africa 1600-1700) SIO222 at 1630 by **Phil Townsend** in E.London; REE via Noblejas 21.570 (Sp to S/C.America 1200-1800) 45454 at 1713 in Storrington; WYFR via Okeechobee. USA 21.745 (Eng to Eur 1600-1800) 45344 at 1729 by **Vera Brindley** in Woodhall Spa; WYFR via Okeechobee, USA 21.525 (Eng, Fr, Ger, Port to W.Africa 1600-2045?) 14241 at 2030 by **Darren Beasley** in Bridgwater.

The propagation conditions in the **17MHz (16m)** band also vary from day to day. Sometimes R.Australia's broadcast to Asia, Pacific via Carnarvon on 17.715 (Eng 0200-0900) can be received in the UK. It was rated SIO222 at 0435 in Woking; SIO322 at 0800 by **Tom Smyth** in Co.Fermanagh; 45544 at 0820 by **Stan Evans** in Herstonmoex.

Other broadcasters using this band include R.Romania Int 17.720 (Eng to Pacific, F.East 0645-0745) rated SIO222 at 0724 by **Francis Hearne** in N.Bristol; R.Slovakia via Rimavska Sobota 17.555 (Eng to Australia 0830-0857) 55555 at 0833 by **Tom Winzor** in Plymouth; R.Prague, Czech Rep 17.485 (Eng to Asia 0900-0927) 44333 at 0900 in Scalloway; R.Austria Int via Moosbrunn 17.870 (Ger, Eng to Australia 0800-1100) 44344 at 0930 in Truro; R.Pakistan via Karachi 17.900 (Eng to Eur 1100-1120) 35434 at 1104 in Middlesbrough; BBC via Ascension Is 17.830 (Eng to W/C.Africa 0730-2100) 23332 at 1308 in E.Worthing and 25533 at 2053 in Wallsend; R.Romania Int, Bucharest 17.720 (Eng to ? 1300-1330) 34443 at 1325 in Kilkeel; Africa No.1, Gabon 17.630 (Fr to W.Africa 0700-1600) SIO233 at 1345 in E.London; Israel R, Jerusalem 17.545 (Heb [Home Sce

rlly) to W.Eur, N.America 0800-?) 44333 at 1521 in Oxted; Monitor R.Int via WSHB 17.510 (Eng to Africa 1600-2000?) 44434 at 1613 in Woodhall Spa; R.Nederlands via Bonaire 17.605 (Eng, Du to S/E/W.Africa 1830-2025) 35233 at 1850 by **Eddie McKeown** in Newry; BBC via Ascension Is 17.880 (Fr, Eng to Africa 1800-1945) 32222 at 1915 by **Martin Dale** in Stockport; RFI via Fr.Guiana? 17.630 (Fr to America 1600-2200?) 35444 at 1917 in Storrington; WYFR via Okeechobee, USA 17.845 (Eng to Africa 2000-2300?) 35433 at 2043 in Bridgwater; RCI via Sackville 17.820 (Eng to Eur, Africa 2000-2130) 45333 at 2050 in Chester; VOFC Taiwan via WYFR 17.750 (Sp, Ger, Eng to Eur, [Eng 2200-2300]) 44444 at 2225 by **Tony Hall** in Freshwater Bay, IoW.

Rather more reliable conditions have been evident in the **15MHz (19m)** band. During the morning R.Japan via Moyabi, Gabon 15.165 (Eng to Eur, M.East, Africa 0700-0800) was 32432 at 0725 in Bridgwater; Monitor R.Int via KHBI Agingan Pt, N.Mariana Is 15.665 (Eng to E.Eur? 0800-0855) 25422 at 0800 in Galashiels; R.Africa 2, Eq.Guinea 15.186 (Eng to Africa 0700?-1100? Mon-Fri) 33333 at 0900 in Scalloway; BBC via Ascension Is 15.400 (Eng to W/C.Africa 0730-1130) 35443 at 0949 in Middlesbrough; BBC via Masirah Is, Oman 15.310 (Eng to S.Asia 0300-0915, 1000-1500) 33443 at 1125 in Kilkeel.

During the afternoon BBC via Limassol, Cyprus 15.575 (Eng to E.Eur, M.East, W.Asia 0730-1500) was 34433 at 1310 in Herstonmoex; RCI via Sines, Portugal 15.325 (Eng to Eur, Africa 1330-1400) 44444 at 1330 in Truro; Israel R, Jerusalem 15.615 (Eng to ? 1400-1430) 43233 at 1400 by **Clare Pinder** in Appleby; Voice of Turkey, Ankara 15.350 (Tur to Eur 1000-1700) SIO555 at 1447 by **Philip Rambaut** in Macclesfield;

# Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof-Saale (BR)	Germany	0.2	B*,C	873	Zaragoza(SER)	Spain	20	H*,I*,L*,M*	1350	Nancy/Nice	France	100	H*,I*,L*,M*,O
520	Hof/Hurzberg (BR)	Germany	0.2	L*	882	COPE via ?	Spain	?	H*,I*,L*,M*	1359	Arganda (RNE-FS)	Spain	600	H*,I*,L*
531	Ain Beida	Algeria	600	B*,I*,L*,M*	882	Washford(BBCWales)	UK	100	A.C.,E.F.,I.,K.L,M,N*,O	1368	Foxdale(Manx R)	I.O.M.	20	E*,G*,J*,K,L*,M*
531	Torsnavn	Faeroe Is.	100	F*	891	Algiers	Algeria	600/300	H*,I*,L*,M*,N*,O	1377	Lille	France	300	B*,I*,L*,M,O
531	Laizig	Germany	100	C*,F*,H*,K*,L*,M*	891	Huisberg	Netherlands	20	H*,I*,L*,M*	1377	Ukraine	Ukraine	50	H*
531	RNE5 via ?	Spain	?	F*,L*,M*	900	Brno(CRo2)	Czech Rep	25	H*	1386	Athens	Greece	50	L*
531	Beromunster	Switzerland	500	F*,L*	900	Milan	Italy	600	H*,L*,M*	1386	Bolshakovo	Russia	2500	D*,E*,H*,I*,L*,M*,P*,O
540	Wavre	Belgium	150/50	B*,C*,H*,I.,L,M,N,O	900	COPE via ?	Spain	?	L*	1395	Lushnje(Titana)	Albania	1900	I*,L,O
540	Soit	Hungary	2000	L*	900	Qurayyat	Saudi Arabia	1000	F*,I*	1395	TWR via Lushnje	Albania	500	H*
540	Sidi Bennour	Morocco	600	H*,I*,L*,M*	909	B'mans Pk(BBCS)	UK	140	C*,F*,J.,K.L,M,N*	1395	Lopiv?	Netherlands	?	L*,M,O
540	Vitoria(EI)	Spain	10	L*,M*	918	Plesivec(SlovenrR)	Slovenia	600/100	B*,I*,L*,M*	1404	Brest	France	20	H*,I*,L*,M*
549	Les Trembles	Algeria	600	H*,I*,L*,M*	918	Madrid(R.Int)	Spain	20	H*,I*,K,L*	1413	RNE5 via ?	Spain	?	L*,M*
549	Thurnau (DLF)	Germany	200	B*,C*,H*,I*,L*,M*,O	927	Volwertem	Belgium	300	C*,H*,I.,L,M,N*,O	1422	Heusweiler(DLF)	Germany	1200/600	C*,H*,I.,L*,M*,O
558	Espoo	Finland	100	F*,I*,N*	927	Velke Kostolany	Slovakia	40	H*,L*	1422	Valmiera	Latvia	50	H*,L*
558	Rostock(NDR)	Germany	20	H*,M*	927	Evora(RRE)	Portugal	1	L*	1440	Marnacchi(RTL)	Luxembourg	1200	E*,H*,J*,L,M, N*,O,P*
558	RNE5 via ?	Spain	?	F*,H*,I*,M*	936	Bremen	Germany	100	C*,H*,I.,L*,M*	1440	Damman	Saudi Arabia	1600	H*
567	Berlin	Germany	100	N	936	Venezia	Italy	20	L*	1449	Squinzano	Italy	50	I*,L
567	Tullamore(RTE1)	Ireland (S)	500	B*,C*,D.,G.,K.L,M,O	936	RNE5 via ?	Spain	?	B*,H*,I.,L*,M*	1449	Redmoss(BBC)	UK	2	G.H.,K*,L
567	RNE5 via ?	Spain	?	L*,M*	945	Toulouse	France	300	B*,H*,I.,L	1458	Lushnje(Titana)	Albania	500	L*
576	Muhlacken(SDR)	Germany	500	B*,C*,H*,I.,L*,M*	954	Brno (Cro2)	Czech Rep.	200	I*,L,M*	1467	Chisinau	Moldova	50	L*
576	Riga	Latvia	500	I*	954	Madrid(CI)	Spain	20	B*,I*,L*,M*,N*	1467	Grigoriopol	Moldova	500	H*
576	Barcelona(RNE5)	Spain	50	B*,F*,I.,L*,M*	963	Paoli	Finland	600	H*,I*,M*,N*	1467	Monte Carlo(TWR)	Monaco	1000/400	H*,I.,L,M*,O
585	Ort Wien	Austria	600	L*	963	Tir Chonaili	Ireland (S)	10	B*,I*,K	1485	AFN via ?	Germany	1	L*
585	Paris(FIP)	France	8	I,L,O	972	Hamburg(NDR)	Germany	300	C*,H*,I.,L*,M*,N*	1494	Clermont-Ferrand	France	20	H*,L*
585	Madrid(RNE1)	Spain	200	B*,H*,I.,L*,M*,O	972	RNE1 via ?	Spain	?	L*	1494	St Petersburg	Russia	1000	D*,E*,H*,I.,M*,P*,L
585	Dumfries(BBCScott)	UK	2	L*,M*	981	Alger	Algeria	600/300	B*,I*,L*,M*,O	1503	RNE5 via ?	Spain	?	L*
594	Frankfurt(HR)	Germany	1000/400	B*,C*,H*,I.,K,L*,M*	981	Coimbra	Portugal	10	L*	1512	Volwertem	Belgium	600	C*,E*,H*,I.,K*,L,M*
594	Oujda-1	Morocco	100	I*,L*	990	Berlin	Germany	300	C*,H*,I.,L*,M*	1521	Kosice(Cizatec)	Slovakia	600	I*
594	Muge	Portugal	100	H*,I.,L*,M*	990	R.Bilbao(SER)	Spain	10	B*,L*,M*,O	1521	Duba	Saudi Arabia	2000	I*,K,M*
603	Lyon	France	300	N	990	Redmoss(BBC)	UK	1	H*,K,L*	1530	Vatican R	Italy	150/450	B,C*,E*,H*,I.,L,M,O,P*
603	Sevilla(RNE5)	Spain	50	H*,I.,L*,M*	990	Twynn(BBC)	UK	1	B*,E*,G.L*	1539	SER via ?	Spain	?	L*
603	Newcastle(BBC)	UK	2	G,K	999	Schwerin (RIAS)	Germany	20	H*	1539	Valladolid(SER)	Spain	5	I*
612	Athlone(RTE2)	Ireland (S)	100	C*,G.,I.,K,L*,M*,O	999	Torino	Italy	20	F*,L,M*	1557	Nice	France	300	L*
612	Sebba Aioun	Morocco	300	I*,L*	999	Madrid(COPE)	Spain	50	L*	1557	Cyclops(DW)	Malta	500	L*
612	RNE1 via ?	Spain	10	I*,L*,M*	1008	SER via ?	Canaries/Spain	?	F*,L*,M*	1566	Sarnen	Switzerland	300	I*
621	Wavre	Belgium	80	C*,H*,I.,L,M,N	1008	Flevo(Hilv-5)	Holland	400	F*,H*,I.,L,M,O	1566	Stax	Tunisia	1200	H*,L*
621	RNE1 via ?	Spain	10	L*,M*	1017	Rheinsender(SWF)	Germany	600	B*,C*,F*,H*,I.,L*,M*	1575	Genova	Italy	50	H*,L*
621	Barcelona(OCR)	Spain	50	I*	1017	RNE5 via ?	Spain	?	H*	1575	SER via ?	Spain	5	I*,L*,M*
630	Vigra	Norway	100	H*,I.,L*,M*	1026	SER via ?	Spain	?	B*,H*,I.,L*,M*	1584	SER via ?	Spain	2	G*,L*
630	Tunis-Djedeida	Tunisia	600	H*,I.,L*,M*	1035	Lisbon(Prog3)	Portugal	120	H*,M*	1593	Holzkirchen(VOA)	Germany	150	H*,I.,L,O
639	Praha(Liblice)	Czech	1500	H*,I.,K,L	1044	Dresden(MDR)	Germany	250	C*,H*,I.,L*,M*	1602	SER via ?	Spain	?	L*,M*
639	RNE1 via ?	Spain	?	B*,H*,I.,L*,M*	1044	Sebba-Aioun	Morocco	300	I*	1602	Vitoria(EI)	Spain	10	I*
648	RNE1 via ?	Spain	10	H*,L*,M*	1044	SER via ?	Spain	?	I*,L*,M*	1611	Vatican R	Italy	15	L*
648	Orfordness(BBC)	UK	500	K.L.M*,N*,O	1053	Zaragoza(COPE)	Spain	10	H*,L*					
657	Neubrandenburg(NDR)	Germany	250	L,M*	1062	Kalunborg	Denmark	250	D*,F*,H*,I.,L					
657	Napoli	Italy	120	B*,I*,L*,M*	1062	R.Uno via ?	Italy	?	L*,M*					
657	Madrid(RNE5)	Spain	20	H*,I.,L*,M*	1071	R.France via ?	France	?	H*,K,L,M*					
657	Wrexham(BBCWales)	UK	2	C*,E.F.,H*,K,L,M,N*,O	1071	Brest	France	20	I*					
666	Messkirch(Rohrd(SWF)	Germany	300/180	C*,H*,I.,L*,M*,O	1071	Lille	France	40	O					
666	Sitkuna(R.Vilnius)	Lithuania	500	L*,M*	1071	Riga	Latvia	50	I*					
666	Lisboa	Portugal	135	I*,L*,M*	1071	Bilbao(EI)	Spain	5	I*,L*,M*					
666	Barcelona(COPE)	Spain	10	L*	1071	Talk Radio UK via ?	UK	?	F*,L,M					
675	Marseille	France	600	F*,H*,I.,L*,M*	1080	Katowice	Poland	1500	L*					
675	Lopiv(R10 Gold)	Holland	120	D*,E*,H*,I.,L,M,N*,O	1080	SER via ?	Spain	?	H*,I.,L*,M*					
684	Sevilla(RNE1)	Spain	500	H*,I.,L*,M*	1089	Talk Radio UK via ?	UK	?	A.C*,I.,K.L,M,O					
684	Avalal(Beograd-1)	Yugoslavia	2000	H*,I.,L*,M*	1088	Nitra(Jarok)	Slovakia	1500	C*,H*,I.,L*,M*,N*					
693	Tortosa(RNE1)	Spain	2	H*,L*	1088	RNE5 via ?	Spain	?	L*					
693	Droitwich(BBCS)	UK	150	A.C*,F.,I.,K,L,M,N*,O	1107	AFN via ?	Germany	10	H*,L*					
702	Flensburg(NDR)	Germany	5	C*,H*,I.,L*,M*	1107	RNE5 via ?	Spain	?	L*,M*					
702	Monte Carlo	Monaco	40	I*	1107	Talk R UK via ?	UK	?	A.L.L.M.O					
702	Slovensko 1 via ?	Slovak Rep.	?	C*,L*	1116	Bari	Italy	150	L*					
702	Zamorin(RNE1)	Spain	10	I*,L*,M*	1116	Pontevedra(SER)	Spain	5	L*					
711	Rennes 1	France	300	O,I,L,O	1125	La Louviere	Belgium	20	H*,I*,L,O					
711	Heidelberg	Germany	5	C*,H*,L*,M*	1125	Deanovec	Croatia	100	L*					
711	Laayoune	Morocco	600	I*	1125	RNE5 via ?	Spain	?	H*,I.,L*,M*					
711	Murcia(COPE)	Spain	5	L*,M*	1125	Llandrindod Wells	UK	1	A.G					
720	Lisnagavey(BBC4)	Ireland (N)	10	I*	1134	COPE via ?	Spain	2	I*,L*,M*					
720	Norte	Portugal	100	H*	1134	Zadar(Croatian R)	Yugoslavia	600/1200	B*,H*,I.,L*,M*					
720	Stax	Tunisia	200	I*	1143	AFN via ?	Germany	?	C*,H*,I.,L*,M*					
720	Lots Rd,Ldn(BBC4)	UK	0.5	F*,I.,L,M*	1143	Bolshakovo(Mayak)	Russia	150	L*					
729	Cork(RTE1)	Ireland (S)	10	G.H.,I.,K*,L*,M*,N*	1143	COPE via ?	Spain	2	H*,I.,L*,M*					
729	RNE1 via ?	Spain	?	H*,I.,L*,M*	1152	RNE5 via ?	Spain	10	G.M*					
738	Paris	France	4	I*	1161	Strasbourg(Fint)	France	200	H*,I.,L,M*					
738	Poznan	Poland	300	I*,L*	1179	SER via ?	Spain	?	H*,I.,L*,M*					
738	Barcelona(RNE1)	Spain	500	H*,I.,L*,M*	1179	Solivesborg	Sweden	600	F*,H*,I.,L*,M*,P*					
747	Flevo(Hilv2)	Holland	400	C*,H*,I.,L,M,O	1188	Kuurne	Belgium	5	H*,I.,L,O					
747	Cadiz(RNE5)	Spain	10	H*,L*	1188	Reichenbach(MDR)	Germany	5	C*,L*,M*					
756	Braunschweig(OLF)	Germany	800/200	C*,H*,I.,L*,M*	1188	Szolnok	Hungary	135	H*,I*					
756	Bilbao(EI)	Spain	5	G.H.,I.,L*,M*	1197	Munich(VOA)	Germany	300	H*,M*					
756	Redruth(BBC)	UK	2	A.G,I,K	1197	Virgin via ?	UK	?	A.C*,I.,L,M,O					
765	Sottens	Switzerland	500	C*,H*,I.,L*,M*	1206	Bordeaux	France	100	H*,L*					
774	Sofia	Bulgaria	50	I*	1206	Wroclaw	Poland	200	L*					
774	RNE1 via ?	Spain	?	B*,H*,I.,L*,M*	1215	Virgin via ?	UK	?	A.C*,F.,I.,K,L,M					
783	Burg	Germany	1000	B*,C*,H*,I.,L*,M*	1224	Lelystad	Holland	25	H*,L,M*					
783	Miramar(R.Porto)	Portugal	100	I*	1233	Liege	Belgium	5	H*,L*					
783	Dammam	Saudi Arabia	100	M*	1233	Virgin via ?	UK	?	A.L.M					
792	Limoges	France	300	I,K	1242	Marseille	France	150	L*					
792	Lingen(NDR)	Germany	5	C*,H*,I.,L*	1242	Virgin via ?	UK	?	L,M					
792	Sevilla(SER)	Spain	20	I*,L*,M*	1251	Marcali	Hungary	500	H*,L*					
792	Londonderry(BBC)	UK	1	H*	1251	Huisberg	Netherlands	10	H*,L*,M*					
801	Munchen-Ismaning	Germany	300	C*,H*,K*,L*,M*	1251	Porto	Portugal	10	L*					
801	Ajlon	Jordan	2000	L*	1260	SER via ?	Spain	?	H*,L*					
801	RNE1 via ?	Spain	?	F*,H*,I.,L*,M*	1260	Guildford (V)	UK	0.5	I					

# Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.p (kW)	Listener	Freq (kHz)	Station	ILR BBC	e.m.p (kW)	Listener
558	Spectrum, London	I	0.80	A,H,J,L,M	1170	Amber SGR, Ipswich	I	0.28	I*
585	R.Solway	B	2.00	B,H	1170	GNR, Stockton	I	0.32	I
603	Cheltenham R.	I	0.10	A,B,C,H,J,L,M	1170	SCR, Portsmouth	I	0.12	H,J
603	Invicta SG, Litt'brne	I	0.10	H,J,L,O	1170	Signal G, Stoke-on-T	I	0.20	M
630	R.Bedfordshire(3CR)	B	0.20	A,B,D,E,H,J,L,M,O	1170	Swansea Snd, Swansea	I	0.58	B
630	R.Cornwall	B	2.00	B,H,J	1170	1170AM, High Wycombe	I	0.25	H,L,O
657	R.Ciwyd	B	2.00	A,B,E,H,J,O	1242	Invicta SG, Maidstone	I	0.32	H,L,O
657	R.Cornwall	B	0.90	B,H,J	1242	IoW Radio, Wootton	I	0.50	H,J,N*
666	Gemini AM, Exeter	I	0.34	A,H,J,L	1251	Amber SGR, Bury St Ed	I	0.76	H,L,N*,O
666	R.York	B	0.80	B,H,J,M,O	1260	Brunei CG, Bristol	I	1.60	A,H
729	BBC Essex	B	0.20	C,H,J,L,M,O	1260	Marcher G, Wrexham	I	0.64	I
736	Hereford/Worcester	B	0.037	A,B,E,F,H,L,M,N*,O	1260	Sabras Snd, Leicester	I	0.29	H,M,N*
756	R.Cumbria	B	1.00	B,I,K	1278	Gt.Yks G, Bradford	I	0.43	N*
756	R.Maldwyn, Powys	I	0.63	B,G*,H,J	1296	Radio XL, Birmingham	I	5.00	A,B,C,F*,H,J,L,M,O
765	BBC Essex	B	0.50	A,B,H,J,L,M	1305	Gt.Yks G, Barnsley	I	0.15	I
774	R.Kent	B	0.70	B,H,J,L,O	1305	Premier via ?	I	0.50	H*,J,L
774	R.Leeds	B	0.50	B,H,J	1305	Touch AM, Newport	I	0.20	A,J
774	3 Counties SG, Glos	I	0.14	A,J,M	1323	S.Coast R, Brighton	I	0.50	C,H,J,L,O
792	Chiltern SG, Bedford	I	0.27	A,F,H,J,L,M,N*,O	1323	Somerset Snd, Bristol	B	0.63	A,B,F*,H
792	R.Foyle	B	1.00	B,K*	1332	Premier, Battersea	I	1.00	H*,J,L
801	R.Devon & Dorset	B	2.00	A,B,E,H,J,L	1332	WGMS CG, Peterboro'	I	0.60	I,M
828	Chiltern SG, Luton	I	0.20	A,F,H,L,M,O	1332	Wiltshire Sound	B	0.30	A,H
828	2CR CG, Bournemouth	I	0.27	J	1359	Breeze AM, Chelmsford	I	0.28	H,L
837	R.Cumbria/Furness	B	1.50	B,I	1359	Merica CG, Coventry	I	0.27	M
837	R.Leicester	B	0.45	A,F,H,J,L,M,O	1359	R.Solent	B	0.85	A,H,J,L
855	R.Devon & Dorset	B	1.00	H,J,P	1368	R.Lincolnshire	B	2.00	H,K,L,M
855	R.Lancashire	B	1.50	I	1368	Southern Counties R	B	0.50	H,J,L,O
855	R.Norfolk	B	1.50	C,H,L,M,O	1368	Wiltshire Sound	B	0.10	A,H,J
855	Sunshine 855 Ludlow	I	0.15	A,D,H,L	1377	Asian Sd, Manchester	I	?	I
873	R.Norfolk	B	0.30	A,B,C,F,H,J,L,M,O	1413	Premier via ?	I	0.50	A,H*,J,L,M
936	Brunei CG, W.Waits	I	0.18	A,B,H,J,L	1431	S.Coast R, Southend	I	0.35	H*,J,L,M*,O
945	Derby (Gem AM)	I	0.20	B,F*,H,J,L,M,O	1431	210 CG, Reading	I	0.14	A,H*,J,L
954	Gemini AM, Torquay	I	0.32	H,J	1449	R.Peterboro/Cambis	B	0.15	B,H,J,L,M
954	Wyvern, Hereford	I	0.16	A,H,L	1458	R.Cumbria	B	0.50	B
963	Asian Sd, Manchester	I	?	B,I	1458	R.Devon & Dorset	B	2.00	A,B,H*,J
963	Viva, Southall	I	1.00	A,H,J,K*,L,M	1458	Fortune, Manchester	I	5.00	I,K
990	R.Devon & Dorset	B	1.00	A,B,H,J	1458	R.Newcastle	B	2.00	I
990	Gt.Yks G, Doncaster	I	0.25	H,O	1458	Sunrise, London	I	50.00	A,H,J,L,M
990	WABC, Wolverhampton	I	0.09	H	1458	Radio WM	B	5.00	H,M
999	Gem AM, Nottingham	I	0.25	H,L*	1476	County Snd, Guildford	I	0.50	A,F*,H*,J,L,O
999	Red Rose G, Preston	I	0.80	B,I*	1485	R.Humberside (Hull)	B	1.00	H,I,M
999	R.Solent	B	1.00	A,H,J,L,O	1485	R.Merseaside	B	1.20	B,F,K,L
1017	WABC, Shrewsbury	I	0.70	A,B,G*,H,M	1485	Southern Counties R	B	1.00	A,F,H,J,L,O
1026	R.Cambridgeshire	B	0.50	A,F,H,L,M,O	1503	R.Stoke-on-Trent	B	1.00	A,B,H,J*,L,M
1026	Downtown, Belfast	I	1.70	B,K*	1521	R.1521 Craigavon, NI	I	0.50	B,I
1026	R.Jersey	B	1.00	E,H,J	1521	Mercury Xtra, Reigate	I	0.84	A,H*,J,K,L,O
1035	Country 1035, London	I	1.00	A,H*,J,L	1530	R.Essex	B	0.15	H,J,L,O
1035	R.Sheffield	B	1.00	M	1530	Gt.Yks G, Huddersfield	I	0.74	B,I,K*
1035	N.Sound, Aberdeen	I	0.78	B,I	1530	Wyvern, Worcester	I	0.52	A,J,L,M
1107	Moray Fth, Inverness	I	1.50	I	1548	R.Bristol	B	5.00	A,H
1116	R.Derby	B	1.20	B,H,J,L,M,N*,O	1548	Capital G, London	I	97.50	H,J,L,M
1116	R.Guernsey	B	0.50	A,H,J,L	1548	City G, Liverpool	I	4.40	B,H*,K
1152	Amber, Norwich	I	0.83	H,J*	1548	Max AM, Edinburgh	I	2.20	I
1152	Clyde 2, Glasgow	I	3.06	I	1557	R.Lancashire	B	0.25	B,I
1152	GNR, Newcastle	I	1.80	I	1557	Mellow, Clacton	I	0.8	H,I*,L*
1152	Lon. Newstaik, London	I	23.50	H,J,L,N*	1557	Northants SG	I	0.76	H,I*,L,M
1152	Pic'ly G, Manchester	I	1.50	B	1557	Sth Coast R, Sol'ton	I	0.50	A,H,J
1152	Xtra-AM, Birmingham	I	3.00	A,H,M	1584	KOBC, Kettering	I	0.04	H,M
1161	R.Bedfordshire(3CR)	B	0.10	H,L,M,O	1584	London Turkish R	I	?	F,H,J,L
1161	Brunei CG, Swindon	I	0.16	A,B,H,J,L	1584	R.Nottingham	B	1.00	H*,J*,M
1161	Gt.Yks, Hull	I	0.35	I*	1584	R.Shropshire	B	0.50	A,B,H
1161	Southern Counties R	B	1.00	F,H,J,L	1584	Tay, Perth	I	0.21	I
1161	Tay AM, Dundee	I	1.40	B,I,K	1602	R.Kent	B	0.25	A,B,H,J,L,M*,O

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

### Listeners:

- (A) Brian Bosson, Calne.
- (B) Robert Connolly, Kilkeel.
- (C) John Eaton, Woking.
- (D) Francis Heame, N.Bristol.
- (E) Simon Hockenhill, E.Bristol.
- (F) Sheila Hughes, Morden.
- (G) Stephen Jones, Oswestry.
- (H) Brian Keyte, Bookham.
- (I) Ross Lockley, Galashiels.
- (J) George Millmore, Wootton, IoW.
- (K) Tom Smyth, Co.Fermanagh.
- (L) Tony Stickells, Thornton Heath.
- (M) Andrew Stokes, Leicester.
- (N) Norman Thompson, Oadby.
- (O) Phil Townsend, E.London.
- (P) Tom Wintor, Plymouth.

N.America 0930-1605) 44333 at 0953 in Oxted; R.Finland via Pori 13.645 (Fin, Eng to Australia 1000-1100) 43434 at 1000 by **Gerald Guest** in Dudley.

After mid-day WWCN Nashville, USA 13.845 (Eng to E.USA 1400-0100) was SIO322 at 1445 in Macclesfield; AWR via Slovakia 13.590 (Eng to Africa 1600-1700) 45344 at 1621 in Woodhall Spa; UAER, Dubai 13.675 (Ar [Home Sce relay] to Europe 1700-2100) 34434 at 1700 in Oadby; R.Pyongyang, Korea 13.785 (Eng to Eur, M.East, Africa 1700-1750) SIO343 at 1707 in Doncaster; WHRI South Bend, USA 13.760 (Eng to E.USA, Eur 1500-2157) 24332 at 1800 in Chester; WEWN Birmingham, USA 13.695 (Eng to Eur 2000-2157) 55555 at 2018 in Plymouth; Monitor R.Int via WSHB 13.770 (Eng to Eur 2000-2157) 32242 at 2043 in Woking; RCI via Sackville 13.650 (Eng to Eur 2000-2158) 55444 at 2117 in Middlesbrough; R.Havana, Cuba 13.715 (Eng to Eur 2100-2200) 35233 at 2145 in Newry; R.Pyongyang, Korea 13.760 (Eng to N.America 0000-0050) 33333 at 0005 in Kilkeel; RCI via Sackville 13.670 (Eng to USA, Caribbean 0100-0300) 25322 at 0144 in Burnham-on-Crouch.

Broadcasts from many areas also reach the UK in the **11MHz (25m)** band. Among those noted before noon were HCJB Quito 11.615 (Eng to Eur 0700-0830), rated SIO444 at 0817 in N.Bristol; Slovak R.Int, via Velke Kostolany 11.990 (Eng to Australia 0830-0857) SIO444 at 0855 in Doncaster; FEBC (KFBS) Marpi, N.Mariana Is 11.650 (Russ to Russia 0900-1100) 25333 at 0928 in Guildford; R.Korea Int via Sackville, Canada 11.715 (Eng to S.America 1030-1100) 33233 at 1030 in Appleby.

During the afternoon Polish R, Warsaw 11.815 (Eng

to Eur 1200-1255) was 44444 at 1220 in Morden; HCJB Quito, Ecuador 12.005 (Eng to Caribbean 1100-1500) 23322 at 1227 in Burnham-on-Crouch; R.Romania Int, Bucharest 11.940 (Eng to Eur 1300-1400) 33333 at 1309 in Stockport; Vatican R, Italy 11.625 (Eng to Asia, Pacific 1345-1405) SIO222 at 1345 in E.London; WYFR via VOFC Taipei, Taiwan 11.550 Eng to S.Asia 1300-1500) 15341 at 1400 in Chester; R.Jordan via Al Karanah 11.970 (Eng to W.Eur, E.USA 1400-1500) 54433 at 1455 in Herstmonceux; KTWR Agana, Guam 11.580 (Eng to S.Asia 1500-1630) 23222 at 1500 in Scalloway; R.Cairo, Egypt 12.050 (Ar [Home Sce Relay] to Eur, N.America 0100-2300) 54454 at 1500 in Oadby.

Later, R.Australia via Carnarvon 11.660 (Eng to S.Asia 1430-2057?) was 44434 at 1705 in Woking; R.Algiers Int via Bouchaoui 11.715 (Eng to M.East, Eur 1800-1900) SIO433 at 1803 in Doncaster; R.Kuwait via Kabd 11.990 (Eng to Eur, N.America 1800-2100) 33333 at 1808 in Plymouth; Voice of Greece, Athens 11.645 (Gr, Eng to Africa 1800-1850) 44444 at 1849 in Newry; Israel R, Jerusalem 11.605 (Eng to Eur, USA 1900-1930) 33223 at 1915 in Truro; R.Romania Int, Bucharest 11.940 (Eng to Eur 1900-1955) 53454 at 1951 in Middlesbrough; RCI via Sackville 11.690 (Eng to Eur, Africa 2000-2130) 44434 at 2009 in E.Worthing; AIR via Bangalore 11.620 (Hi, Eng to Eur 1745-2230) SIO433 at 2100 in Co.Fermanagh; REE via Noblejas, Spain 11.775 (Eng to Eur, Africa 2100-2200) 45544 at 2114 in Wallsend; R.Nac da Amazonia, Brazil 11.780 (Port 0900-0200) 33222 at 2201 in Bridgwater; BBC via Kranji, Singapore 11.955 (Eng to F.East 2000-0000) 33333 at 2340 in Kilkeel; RCI via Sackville 11.715 (Eng to USA, Caribbean, Lat.America 0100-0200) 34333 at 0105 in Woodhall Spa.

In the **9MHz (31m)** band R.Havana, Cuba 9.830 (Eng to N.America 0600-0700) was 33233 at 0600 in Appleby; WMLK Bethal, USA 9.645 (Eng to Eur, M.East 0400-0900) 33222 at 0645 in Scalloway; R.Prague via Litomysl 9.505 (Eng to Eur 1000-1057) SIO444 at 1030 in Co.Fermanagh; R.Netherlands via Nauen 9.650 (Eng to Eur 1030-1225) SIO555 at 1140 in Macclesfield; SRI via Lenk? 9.535 (Eng to SW.Eur 1200-1300) 43433 at 1240 in Herstmonceux; R.Romania Int, Bucharest 9.690 (Eng to Eur 1300-1355) 44544 at 1300 in Galashiels; R.Sweden 9.835 (Eng to N.America 1330-1400) 44444 at 1350 in Chester; VOA via Gloria, Portugal 9.760 (Eng to M.East 1700?-2200?) was 34453 at 1735 in Woking; Africa No.1, Gabon 9.580 (Fr to C.Africa 0500-2300) 54544 at 1752 in Guildford.

During the evening the Voice of Turkey, Ankara 9.445 (Eng to Eur 1830-1920) was 45434 at 1858 in Woodhall Spa; Voice of Vietnam, Hanoi 9.840 (Eng to Eur 1900-1930) 43333 at 1920 in Storrington; VOIRI Tehran, Iran 9.022 (Eng to Eur 1930-2027) SIO333 at 1930 in E.London; Voice of Indonesia 9.525 (Eng to Eur 2000-2030) 32542 at 2001 in Bridgwater; Voice of Russia 9.480 (Eng [WSI]) 55555 at 2024 in Plymouth; R.Thailand, Bangkok 9.555 (Eng to Eur 2030-2045) 42333 at 2030 in Morden; R.Pyongyang, N.Korea 9.345 (Eng to Eur 2000-2050) 34333 at 2039 in Burnham-on-Crouch; R.Cairo via Abis 9.900 (Eng to Eur 2115-2245) SIO433 at 2131 in Doncaster; China R.Int, Beijing 9.920 (Eng to Eur 2000-2157) 54444 at 2140 in Freshwater Bay.

Later, R.Norway Int, Oslo 9.485 (Eng to Australia 2200-2230 Sun) was 32333 at 2200 in Truro; R.Nac del Paraguay 9.735 (Sp 0800-0400) 35553 at 2209 in Wallsend; RCI via Sackville 9.755 (Eng [CBC progs] to USA, Caribbean 2200-0000) 33333 at 2214 in Stockport; UAER, Abu Dhabi 9.605 (Eng to N.America 2200-0000) 44444 at 2330 in Kilkeel; UAER, Abu Dhabi 9.770 (Eng to N.America 2200-0000) SIO333 at 2341 in N.Bristol.

The conditions in the **7MHz (41m)** band during the early morning, the evening and at night enable some of the broadcasts from distant places to reach our shores. Those noted in the reports came from KTBN via Salt Lake City 7.510 (Eng to N.America 0000-1600), rated 44544 at 0507 in Woking; Tajik R, Tajikistan 7.245 (Eng to Asia 1645-1700) 22232 at 1645 in Scalloway; R.Australia via Carnarvon? 7.330 (Eng to S.Asia 1800?-2100) 54433 at 1805 in Chester; R.Thailand via Udon Thani 7.210 (Eng to Eur 1900-2000) 43333 at 1915 in Truro; VOA via Selebi-Phikwe, Botswana 7.415 (Eng to

# Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer	Freq (MHz)	Station	Country	UTC	DXer
2.325	ABC Tennant Creek	Australia	2047	G	4.805	R.Nac Amazonas	Brazil	2234	C,J,M,N
2.445	Jiangxi 1, Nanchang	China	0025	C	4.805	R.Villa Rica	Peru	2323	O
2.485	ABC Katherine	Australia	2036	G	4.815	R.diff TV Burkina	Quagadougou	2035	A,C,G,J,K,M,N
3.200	TWR Manzini	Swaziland	1954	G	4.820	Xizang, Lhasa	Tibet	2300	N
3.220	Channel Africa	S.Africa	0401	J	4.825	R.Cancao Nova	Brazil	2241	E,N,O
3.230	R.Kara, Lome	Togo	2202	G,N	4.828	ZBC R-4	Zimbabwe	2105	G,I,K,N
3.240	SABC Meyerton	S.Africa	1939	A,C,E,G,J,M,N,O	4.830	R.Botswana, Gaborone	Botswana	2059	A,E,J
3.240	TWR Shona	Swaziland	1902	G	4.830	R.Tachira	Venezuela	2335	C,F,J
3.245	AIR Lucknow	India	1737	G	4.835	R.Tezulutian, Coban	Guatemala	0149	C,E
3.255	BBC via Maseru	Lesotho	2030	A,F,G,N	4.835	RTM Bamako	Mali	2034	A,C,G,J,J
3.270	R.Ecos del Oriente	Ecuador	2253	E,M	4.840	AIR Bombay	India	1720	K,M,N,O,Q
3.270	SWABC 1, Namibia	S.W.Africa	2020	B,C,G,J,J,K,M,N	4.845	ORTM Nouakchott	Mauritania	2240	A,C,G,M,N
3.290	Namibian BC,Windhoek	S.W.Africa	2250	A,B,C,G,J,M,N,O	4.850	R.Yaounde	Cameroon	2207	C,J,Q
3.300	R.Cultural	Guatemala	2322	J	4.860	AIR Kingsway(Feeder)	India	1852	A,G,N
3.306	ZBC Prog 2	Zimbabwe	2000	A,F,G,K,N	4.870	R.Cotonou	Benin	1856	A,C,G,K,M,N
3.315	AIR Bhopal	India	1733	C,G,O	4.875	R.Roraima, Boa Vista	Brazil	2335	C,N
3.316	SLBS Godenich	Sierra Leone	2020	A,C,F,G,K,N	4.885	R.Clube do Para	Brazil	0154	E,N
3.320	SABC Meyerton	S.Africa	2147	C,G,N	4.885	KBC East Sca Nairobi	Kenya	1854	A,C,G,J,K,N
3.325	FRCN Lagos	Nigeria	2024	A,C,G,K,M	4.890	RIFT Paris	Senegal	0045	N
3.330	Christian Voice	Zambia	1955	G,K	4.895	ORTS Dakar	Senegal	0055	C
3.335	CBS Taipei	Taiwan	2057	G	4.895	Voz del Rio Arauca	Colombia	0505	N
3.338	R.Macuto	Mozambique	2028	M	4.895	AIR Kursesong	India	1708	G
3.340	R.Uganda, Kampala	Uganda	2000	G,K	4.895	Pakistan BC	Pakistan	1729	G
3.345	AIR Jammu	India	1735	C,G	4.905	R.Nat.N.djamena	Chad	2030	A,C,G,K,M,N,O
3.345	Channel Africa	S.Africa	1918	G	4.910	RTG Conakry	Guinea	1845	O
3.355	R.Nac.Luanda	Angola	2215	C	4.910	R.Zambia, Lusaka	Zambia	2022	F,G,K,N
3.358	R.Botswana	Gaborone	2050	G,K,N	4.915	R.Anhanguera	Brazil	0500	N
3.365	GBC R-2	Ghana	2055	A,C,D,E,F,G,J,K,M,N,O	4.915	GBC-1, Accra	Ghana	2052	A,C,G,J,K,M,N,O
3.365	AIR Delhi	India	1831	G	4.920	R.Quito, Quito	Ecuador	0238	F,N
3.375	R.Nacional S.Gabriel	Brazil	2244	C,M,N,O	4.920	AIR Madras	India	1732	G
3.377	R.Nacional, Mullenos	Angola	2044	G,K,J,O	4.925	R.S.Miguel,Riberalta	Bolivia	2326	O
3.380	NBC Blantyre	Malawi	2045	A,F,G,J,K,N	4.925	R.Mozambique,Maputo	Mozambique	2235	C
3.390	BBC via Meyerton	S.Africa	2042	G	4.927	RRI Jambi	Indonesia	2237	F,M
3.915	BBC via Kranji	Singapore	2250	C,D,E,H,J,M,O,Q,R	4.931	R.Internacional	Honduras	0450	N
3.955	BBC via Skelton	England	2305	J,O,P,Q	4.935	KBC Gen Sca Nairobi	Kenya	2033	C,F,G,K,M,N,Q
3.965	RFI Paris	France	2015	C,I,J,O,Q	4.940	AIR Gwahati	India	1644	G
3.975	R.Budapest	Hungary	2100	I,J,L,O	4.940	R.Abidjan	Ivory Coast	2040	C
3.980	VOA via Munich	Germany	2000	O	4.950	R.Nacional, Mullenos	Angola	2005	C,G
3.985	Nexus, Milan	Italy	1850	Q	4.950	AIR Jammu	India	1715	G
3.985	China R via SRI	Switzerland	2100	L,P,R	4.955	R.Nac. de Colombia	Colombia	2340	N
3.985	SRI Beromunster	Switzerland	2015	P,Q	4.970	PBS Xinjiang	China	1643	G
3.995	DW via Julich	Germany	2010	E,J,O,P,Q	4.980	Ecos del Torbes	Venezuela	2250	A,C,F,J,M,N,O
3.995	DW via Meyerton	S.Africa	2120	C	4.980	FRCN Lagos	Nigeria	2100	A,C,K,N
4.003	RRI Padang	Indonesia	0112	E	5.005	R.Nacional, Bata	Eq Guinea	2053	A,F,K,M,N
4.005	Vatican R.	Italy	1845	O	5.005	R.Nepal, Kathmandu	Nepal	1707	G
4.330	Xinjiang BS, Urumqi	China	0130	E	5.009	RTV Malagasy	Madagascar	1855	N
4.485	R.Fecuencia, Celandin	Peru	2319	E,O	5.010	R.Garoua	Cameroon	1935	A
4.500	Xinjiang BS, Urumqi	China	1644	G	5.015	R.Brazil Tropical	Brazil	2330	O
4.735	Xinjiang, Urumqi	China	1645	C,G	5.020	PBS-Jiangxi Nanchang	China	2325	C
4.755	R.Educ CP Grande	Brazil	0035	C	5.020	La V du Sahel,Niamey	Niger	2050	A,C,G,K,M,N
4.760	Yunnan PBS,Kunming	China	2225	C,M	5.025	R.Parakou	Benin	2050	C,G,K,M,N
4.760	AIR Port Blair	India	1704	G	5.025	R.Rebelde, Habana	Cuba	0455	C,N
4.765	R.Integracao	Brazil	2250	C,N	5.025	R.Uganda, Kampala	Uganda	2028	G
4.770	Centinelas del Sur	Ecuador	2333	E,J	5.030	AWR Latin America	Costa Rica	0007	C,J,N
4.770	FRCN Kaduna	Nigeria	2000	A,C,D,E,F,G,J,K,M,N,O	5.035	R.Bangui	C.Africa	2033	A,C,G,K,M,N
4.775	AIR Imphal	India	1649	G	5.047	R.Togo, Lome	Togo	2033	A,C,G,J,K,M,N,O
4.777	R.Gabon, Libreville	Gabon	2016	G,K,M,N,O	5.050	AIR Azawi	India	0050	C
4.783	RTM Bamako	Mali	2038	A,C,G,K,M,N,O	5.050	R.Tanzania	Tanzania	1701	G,N
4.790	Azad Kashmir R.	Pakistan	1720	E,G	5.055	RFO Cayenne(Matoury)	French Guiana	2240	C
4.790	R.Atlantica	Peru	2325	N	5.060	PBS Xinjiang, Urumqi	China	1636	G,N
4.800	CPBS 2 Beijing	China	2231	M	5.065	R.Candip, Bunia	Zaire	1845	G,N
4.800	AIR Hyderabad	India	1734	C,G	5.075	Caracol Bogota	Colombia	2331	A,C,I,J,M,N,O
4.800	LNBS Lesotho	Maseru	2002	A,C,G,K,M,N					

- DXers:-  
 (A) Darren Beasley, Bridgwater.  
 (B) Paul Bowery, Burnham-on-Crouch.  
 (C) Robert Connolly, Killeel.  
 (D) Ron Damp, Worthing.  
 (E) John Eaton, Woking.  
 (F) David Edwars, Wallsend.

- (G) P.Gordon Smith, Kingston, Moray.  
 (H) Simon Hockenhill, E.Bristol.  
 (I) Sheila Hughes, Morden.  
 (J) Eddie McKeown, Newry.  
 (K) Fred Pallant, Storrington.  
 (L) Clare Pinder, while in Appleby.  
 (M) Richard Reynolds, Guileford.

- (N) John Slater, Scalloway.  
 (O) Andrew Stokes, Leicester.  
 (P) Norman Thompson, Oadby.  
 (Q) Phil Townsend, E.London.  
 (R) Thomas Williams, Truro.

Africa 1900-2230) 34323 at 1940 in Morden; AIR via Aligarh? 7.412 (Hi, Eng to Eur 1745-2230) 54444 at 2051 in Burnham-on-Crouch; WRNO New Orleans, USA 7.355 (Eng to E,USA 2300-0300) 32332 at 2335 in Killeel; VOA via ? 7.205 (Eng to S.Asia 0100-0300) SIO444 at 0218 in N.Bristol.

During the daytime quite a few of the broadcasters in Europe, Scandinavia and the

Middle East use this band to reach listeners in Europe. Most of their programmes can be heard in English but often they are repeated in a variety of other languages, consequently many of the channels are occupied for long periods. They include TWR Monte Carlo, Monaco 7.115 (Eng 0640-0820), rated 55355 at 0715 in Plymouth; R.Japan via Skelton, UK 7.230 (Eng 0700-0800) 33443 at 0735 in Bridgwater;

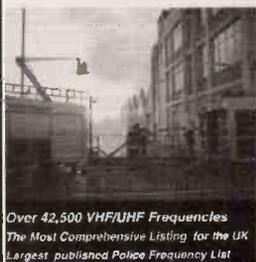
R.Norway Int, Oslo 7.295 (Norw 1100-1129, also to N.America) SIO444 at 1128 in Macclesfield; Polish R, Warsaw 7.285 (Eng 1700-1757) 34133 at 1753 in Woodhall Spa; R.Budapest, Hungary 7.130 (Eng 1900-1930) 42242 at 1906 in Newry; Israel R, Jerusalem 7.465 (Eng 1900-1930, also to N.America) 54544 at 1906 in Freshwater Bay; VOIRI Tehran 7.260 (Eng 1930-2028, also to M.East) 53433 at 1934 in Middlesbrough; R.Romania Int, Bucharest 7.195 (Eng 2100-2156) SIO444 at 2100 in Co.Fermanagh; R.Sweden via Karlsborg? 6.065 (Eng 2130-2200) 43444 at 2140 in Truro; BBC via Skelton, UK 7.325 (Eng 2000-2200) 55555 at 2215 in Oadby.

Many of the broadcasts in the **6MHz (49m)** band are also intended for European listeners. Some originate from SRI via Lenk 6.165 (Eng 0600-0630), rated 55555 at 0625 in Herstonceux; WEWN Birmingham, USA 5.825 (Eng 2100-1000) 35443 at 0715 in Bridgwater; R.Vlaanderen Int, Belgium 6.035 (Eng 0900-0925 Mon-Sat) 44544 at 0907 in Middlesbrough; R.Austria Int, via Moosbrunn 6.155 (Ger, Eng, Fr, Sp 0400-2300) 55555 at 1045 in Oadby; R.Nederlands via Julich 6.045 (Eng 1030-1225) 32333 at 1217 in Stockport; Deutschland R. Berlin 6.005 (Ger 24hrs) 44333 at 1512 in Oxted; R.Estonia, Tallinn 5.925 (Eng 1520-1530, Mon/Thurs only) 44444 at 1520 in Scalloway; R.Prague via Litomysl 5.835 (Eng 1700-1727) 44444 at 1705 in Morden; R.Yugoslavia 6.100 (Eng 1830-1900) 32222 at 1833 in Plymouth; China R.Int, Beijing 6.950 (Eng 2000-2157) heard at 2000 in E.London; R.Budapest, Hungary 5.935 (Eng 2100-2125) 45343 at 2104 in Newry; AWR via Slovakia 6.055 (Eng 2100-2158) 44444 at 2130 in Appleby; R.Sweden via Karlsborg? 6.065 (Eng 2130-2200) 33333 at 2140 in Truro; R.Austria Int via Moosbrunn 5.945 (Fr, Sp, Eng, Ger 1800-2300) SIO333 at 2243 in N.Bristol; Croatian R. via Deanovec 5.895 (Cr [News in Eng 2300-0400 hourly]) 55444 at 0100 in Woodhall Spa.

A number of broadcasts to other areas may also be received in the UK during the evening and after dark. Among those noted were R.Australia via Shepparton 6.090 (Eng to Asia 1430-1900?), rated 53422 at 1910 in Chester; BBC via Antigua, W.Indies 5.975 (Eng to C/S.America 2100-0800) 45444 at 2158 in Burnham-on-Crouch; R.Nac. del Peru, Lima 6.095 (Sp 2200-0500) 22442 at 2257 in Woking; Singapore BC 6.155 (Eng [R.One] 2200-1600) SIO343 at 2301 in Doncaster; R.Nederlands via Bonaire, Ned.Antilles 6.165 (Eng to N.America 2330-0125) 33443 at 2340 in Killeel; RCI via Sackville 5.960 (Eng, Fr to USA, Caribbean 2200-0100) 44544 at 0030 in E.Bristol; DW via Wertachtal? 6.145 (Eng to N.C.America 0100-0150) SIO444 at 0100 in Co.Fermanagh.

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The book covers from 26.17MHz to 12.183GHz in detail - ideal for the scanner user. Also covered, but in much less detail are frequencies down to 410kHz and upward to 105GHz! There is also a useful basic listing of short wave broadcast stations.

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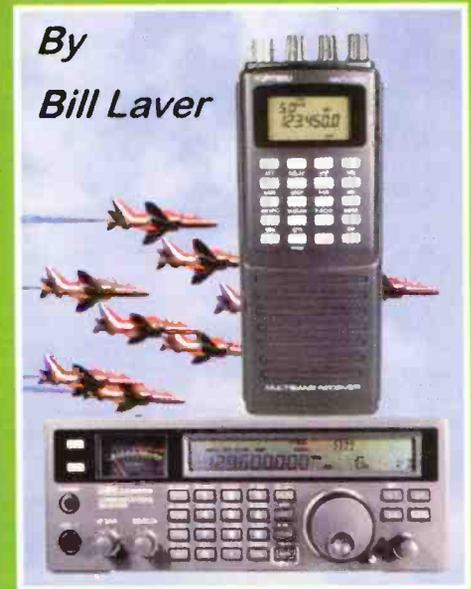
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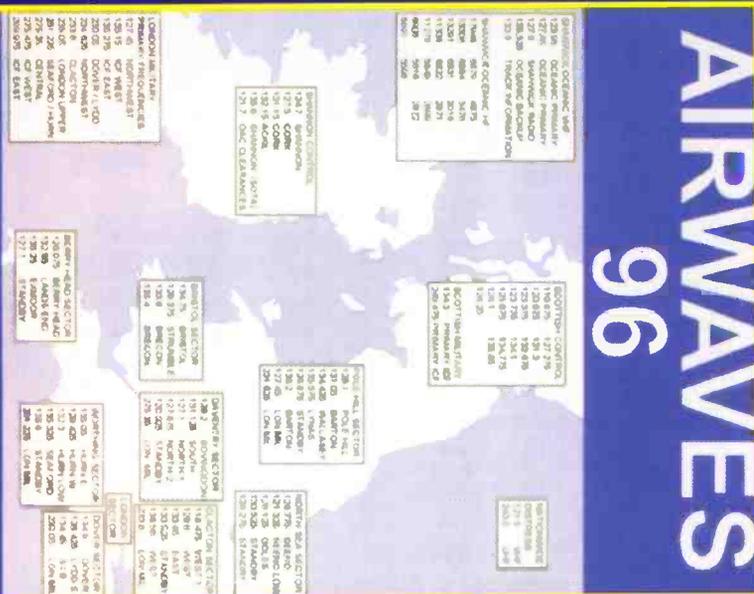
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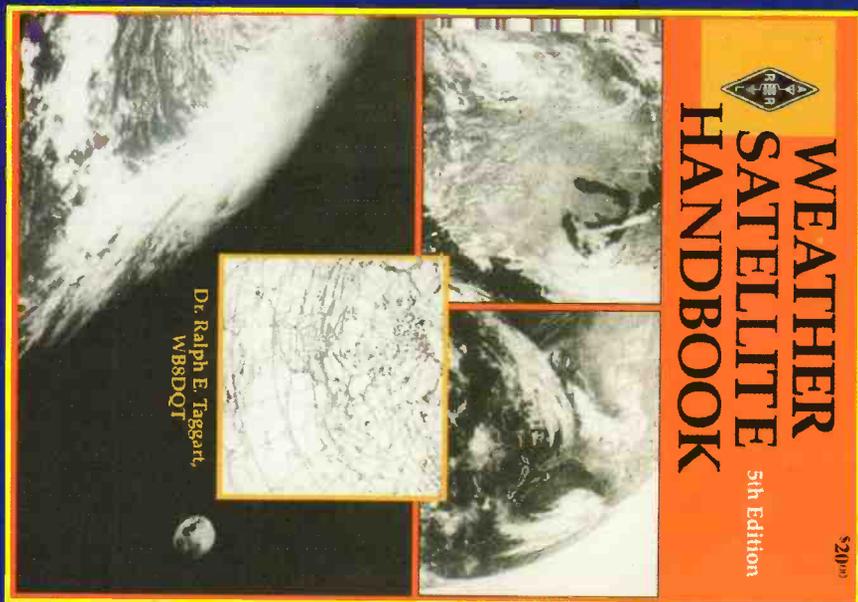
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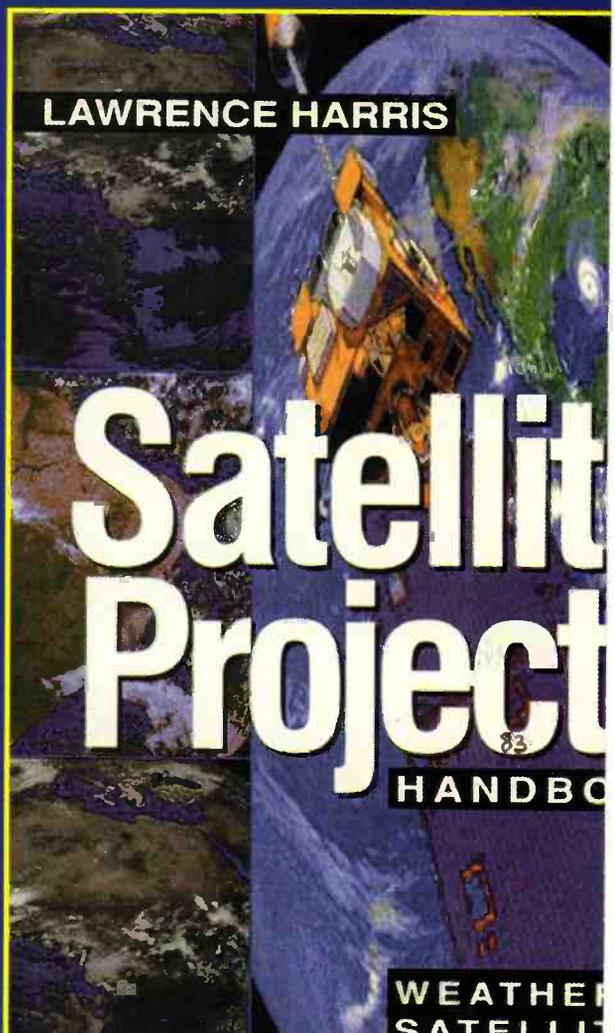
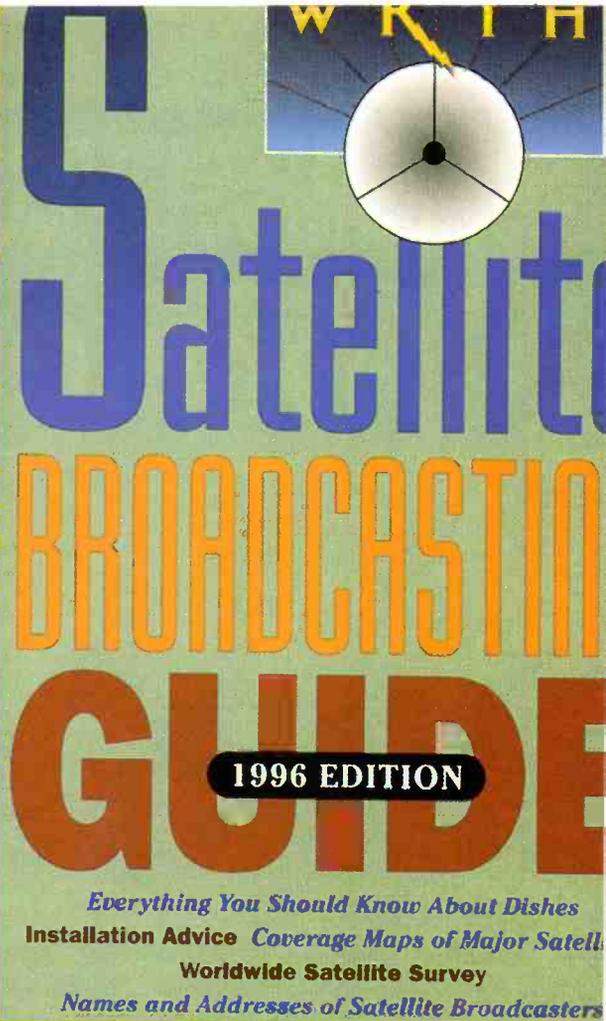


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**PUBLISHED** on the fourth Thursday of each month by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Printed in England by Southernprint (Web Offset), Factory Road, Upton Industrial Estate, Poole, Dorset BH16 5SN. Tel: (01202) 622226. Distributed by Seymour, Windsor House, 1270 London Road, Norbury, London SW16 4DH. Tel: 081-679 1899, Fax: 0181-679 8907. Telex: 881245. Sole Agents for Australia and New Zealand - Gordon and Gotch (Asia) Ltd.; South Africa - Central News Agency Ltd. Subscriptions INLAND £25, EUROPE £28, OVERSEAS (by ASP) £30, payable to SHORT WAVE MAGAZINE, Subscription Department, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. SHORT WAVE MAGAZINE is sold subject to the following conditions, namely that it shall not without the written consent of the publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to as part of any publication or advertising, literary or pictorial matter whatsoever.

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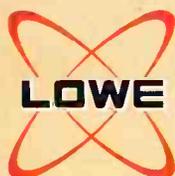
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