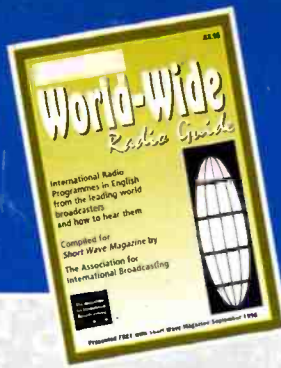


short wave magazine

SEPTEMBER 1998 £2.75

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short wave magazine

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- **The Data Mode Low-Down**
- **Lots Of Complex Data Mode Frequencies Listed**



- **How Does The Icom IC-R8500 Fair On Long Term Test? - Find Out Inside**



all your
Favourites
inside

- **JW Looks At A Bargain Ex-Commercial Gem - Racal's RA1792**



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- 10 digit LCD with signal strength bargraph
- Vibrator and beeper alert mode

DB32 Antenna Sold Separately



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TA100S Antenna Included



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TA100S Antenna Included

In The Spotlight



OPTOCOM

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- Scan trunked and conventional frequencies simultaneously
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Receivers supported under computer control:
Icom R7000, R7100, R8500, R9000 and R10, AOR AR8000, AR3000A, AR5000, and Pro 2005/6 with OS456/OSLite, Pro 2035/42 with OS535

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- Reaction Tunes AR8200, AR8000, ICOM R7000, R7100, R8500, R9000, R10, and Optoelectronics OptoCom
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EDITOR:

Kevin Nice, G7TZC, BR95787

NEWS AND PRODUCTION EDITOR:

Zoë Crabb

EDITORIAL ASSISTANT:

Jo Williams

ART EDITOR:

Steve Hunt

ASSISTANT ART EDITOR:

John Kitching

EDITORIAL ADDRESS:

Arrowsmith Court, Station Approach,

Broadstone,

Dorset BH18 8PW

Telephone: (01202) 659910

Facsimile: (01202) 659950

If you wish to send E-mail to anyone at SWM then our Internet domain name is:

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Simply add the forename of the person you wish to contact.

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kevin@pwpublishing.ltd.uk

BOOKS, BACK ISSUES

& SUBSCRIPTIONS

(ALL ORDERS)

Michael Hurst:

(01202) 659930

(Out-of-hours service by answering machine)

ADVERTISEMENT DEPARTMENT

(Broadstone)

ADVERTISING SALES:

Chris Steadman MBIM

ADVERTISEMENT PRODUCTION:

Carol Trevarton

ADVERTISEMENT TYPESETTING:

Peter Eldrett

Telephone: (01202) 659920

Facsimile: (01202) 659950

ADVERTISEMENT MANAGER:

Roger Hall G4TNT

PD Box 948, London SW6 2DS

Telephone: 0171-731 6222

Facsimile: 0171-384 1031

Mobile: (0585) 851385

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HAYDON EXPAND INTO EUROPE!

Haydon Communications have recently returned from exhibiting at what must be the largest



Ham Radio Show for them to date. Over 35 000 people graced the Friedrichshafen three-day radio show and sales of Haydon's Q-TEK range of antennas were 'amazing' according to Mike Haydon.



Customers from all over Europe visited Haydon's stand and much interest was shown in the 6m Yagi antenna, as this band will be available in Germany



later this year due to the closure of TV services in this part of the spectrum. All in all Haydon Communications report that it was a superb show and definitely one they would recommend visiting next year!

LEICESTER AMATEUR RADIO SHOW

The **27th Leicester Amateur Radio Show** will be held at the Donington International Exhibition Centre at the Donington Park Grand Prix Motor Racing Circuit, Castle Donington in north west Leicestershire on the **25th and 26th September 1998** from 0930 till 1700 each day. Admission for one day is £3, £2.50 for OAPs and children under 16.

A new feature this year is a two day ticket for £5. Parties of 12 or more can get a further discount by booking in advance (£2 each).

The show is easy to get to by air, rail and road. It is five minutes from junction 23A of the M1 motorway close to where the A42 and A50 join the M1. It is three minutes from the East Midlands Airport.

A free shuttle bus service will run from the airport to the exhibition. The nearest railway stations are Derby and Loughborough on the Midland Mainline. However, there is a direct nonstop bus service from the station to the East Midlands Airport costing only £1.

A bus service also runs from Derby passing the railway station and stops immediately outside the entrance to Donington Park. A shuttle bus will run from the entrance to the Exhibition Hall.

There will be 150 stands with all the major traders and amateur magazines attending as well as national clubs and societies. In addition to these there are many component stalls and computer stands, which will be of interest to all electronics enthusiasts.

The venue is all on one level and access for disabled visitors is very easy. There is also parking right outside the main entrance.

The hall itself is purpose built and has a floor area approximately **one third larger** than the previous venue at Granby Halls! Also, the car parking is vast and **free!**

Catering is much improved over the previous venue as there is a cafeteria, snack bar and a licensed bar. There are also many new features including camping and caravanning on site, a meeting room for clubs and societies and a flea market.

There will be all the usual features such as Morse tests on demand and a Bring & Buy stand as well as prize draws and raffles. A number of events are also planned for this weekend, including the RSGB Centenary of Radio Dinner.

For those interested, a discount admission has been arranged to the Donington Collection Motor Museum, which is the world's largest collection of Formula One cars and to the British Superbike Championship.

The latest information can be found on line at

CLASSIC CLANGERS!

The **British Wireless for the Blind Fund** has launched a CD of classic radio clangers from around the world as a fundraising venture for its 70th anniversary. The Golden Goofs have been compiled and are to be presented by broadcaster Jonathan Hewat, who is a member of the BWBF Executive Council.

Bloopers Gold was on sale from the end of July, priced at £8.99 and all net profits will be going directly to the British Wireless for the Blind Fund to provide audio equipment for Registered Blind people in the UK. The momentous moments when broadcasters found their world crashing about their ears have been collected by Jonathan Hewat since 1979, although some of the classic in his collection date back as far as 1934!

"It really is the pick of the collection" says Jonathan, who taught broadcasting and journalism for many years at the University of The West of England in Bristol. According to him, 'The Gold Collection' comes from live broadcasts all over the world, including Africa, South America, Australia and the USA, as well as the UK and Europe.

The CD includes people forgetting their own name, some uncontrollable giggles - live, and possibly the world's longest ever question! Jonathan says "We used to put out cassettes of Bloopers (one each year) for several years, but the joy of the CD format is that you can find a particular blooper quickly and easily". All the clips have been digitally re-mastered and if you have a CD player in the car it can make long journeys a real pleasure and the accompanied booklet itemises all the tracks and each glorious clanger.

To order *Bloopers Gold*, send a cheque or Postal Order payable to '**46 Design**' for £8.99 and post to: **Gabriel House, 34 New Road, Chatham, Kent ME4 4QR**. Please allow 21 days for delivery.



<http://www.lars.org.uk> For stand and table bookings contact **John G4MTP** on (combined telephone and FAX number) **(01604) 790966**, E-mail: g4mtp@mail.com All other enquiries to **Geoff G4AFJ** on **(01455) 823344**, FAX: **(01455) 828273**, E-mail: g4afj@argonet.co.uk

NOW ON WEB

The **International Short Wave League** now has a web page run by Headquarters, the URL is as follows:

<http://website.lineone.net/~john.g0bwg/index.htm>

OOPS!

We have an apology to make to **Twrog Press**. In the August 1998 'Communiqué' pages we incorrectly printed their address and also some incorrect text. *Recent Rigs & Receivers*, the new publication from Twrog Press is actually edited by **Dave Morgan GW4KYZ**. Copies are available from Twrog Press at: **Penybont, Gellilydan, Blaenau Ffestiniog, Gwynedd LL41 4EP** or telephone **(01766) 590341**.

NEW WATSON RANGE

To replace the highly successful Watson range of base power supplies, **Waters & Stanton PLC** have informed us of five brand new models. The new power supplies have been completely redesigned with distinctive and clearly marked front panels and cover most customers' requirements up to 30A output.

The new range fully complies with all CE and LVD legislation and have highly competitive specifications. The new models are as follows: The **W-3A** 3A continuous, 5A peak, fixed voltage power supply; the **W-5A** 5A continuous, 7A peak, fixed voltage power supply; the **W-10AM** 10A continuous, 12A variable power supply with V/A meter; the **W-25AM** 25A continuous, 30A variable power supply with meters and finally the **W-30AM** 30A continuous, 35A variable power supply with meters. The price of these p.s.u.s range from **£22.95** up to **£119.95** inc. VAT.

To find out more, you're invited to contact Waters & Stanton PLC, at **22 Main Road, Hockley, Essex SS5 4QS**. Tel: **(01702) 206835**, FAX: **(01702) 205843**.

A SINGLE PACKAGE

A new product for use in the precision timing and frequency industry has been launched by Motorola. The Oncore

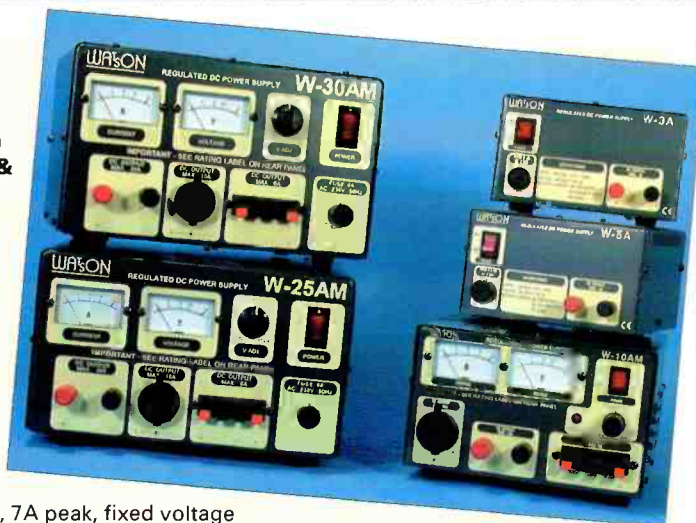
Remote GPS Precision Timing combines a complete GPS receiver and antenna in a single package. Intended for use in harsh environments, it outputs a serial data stream and a highly accurate one pulse per second signal.

By combining the receiver and antenna in a single weatherproof housing, the remote GPS receiver eliminates r.f. signal loss problems and the need for expensive coaxial cable. Instead, a low cost, twisted pair data cable connected the GPS timing device to its host system. The Remote GPS receiver uses RS-422/485 compatible transceivers to provide for remote commands, timing status and the one pulse per second signal interface.

The combination of Motorola's UT Oncore GPS receiver technology and rugged packaging provide an easy to install and cost effective GPS solution for precision timing and frequency

devices used in telecommunications infrastructure, computer networking and other timing applications. The Oncore Remote GPS Precision Timing Receiver, together with optional hardware mounting kits and cables for easy mounting and installation, are now available.

All Motorola GPS receivers are available through Motorola's international network of distributors, which provide sales support and application information. For a full list of European Distributors, contact **Tina Connolly** at **Motorola's Automotive, Components, Computer & Energy Sector, 27 Market Street, Maidenhead, Berkshire**, Tel: **(01628) 763260**, FAX: **(01628) 637059**.



Dick Ganderton G8V FH is shown here attending **Friedrichshafen**, his last exhibition, on behalf of **Short Wave Magazine** and **Practical Wireless** with **Joerg**

Klingenfuss, the compiler and publisher of the famous **Klingenfuss** range of frequency publications. (Photo courtesy of **Waters & Stanton PLC**).

A general view of the main exhibition hall at **Friedrichshafen**, held back on **Thursday 25, Friday 26 and Saturday 27th June** at the large exhibition site beside **Lake Constance in Germany**, near the site of the original **Zeppelin Airship Works**. (Photo courtesy of **Waters & Stanton PLC**).

Jeff Stanton G6XYU with the first production model available in Europe of the new **AOR AR8200** hand scanner with the overseas Sales Director of **AOR**, **Mr Oshima JAIXM**. (Photo courtesy of **Waters & Stanton PLC**).



rallies

August 30: The Galashiels and DARS are holding their Open Day and Rally in the Volunteer Hall, St Johns Street, Galashiels, Scottish Borders from 1100 to 1600. There will be traders, refreshments, Bring & Buy, etc. **Jim GM7LUN** on **(01896) 850245** or packet @ **GB7JED**.

August 31: The Huntingdonshire Amateur Radio Rally, Annual Bank Holiday Monday Rally is to be held at Ernulf Community School, St Neots, Cambridgeshire (near Tesco Superstore on A428). Doors open 1000 to 1400 and admission is £1. There will be hot and cold refreshments available and a hall and car boot sale on handstanding. Talk-in on **S22**. **David Leech G7DIU** on **(01480) 431333** (between 0900 and 2100).

September 6: The Bristol Computer & Radio Rally will be held at the Brunel Centre, Temple Meads Station, Bristol. Doors open 1030 until 1600 (from 1015 for disabled visitors). Admission is £1, accompanied children under 12 go in for free. There will be a large Bring & Buy, under £30 Bring & Buy, refreshments, 150+ tables, table hire at £15 each and parking opposite in the NCP for £1. **Muriel Baker, 62 Court Farm Road, Whitchurch, Bristol BS14 0EG**, or telephone on **(01275) 834282** (24 hour answerphone).

September 6: The Coleraine & District Amateur Radio Society will be holding their annual Radio Rally at the new venue of the Bohill Hotel & Country Club, located a short distance outside Coleraine on the main road to Bushmills and the Giants Causeway. Doors open at 1200 and admission is £1.50. Further information from **John M10AAZ** on **(01265) 54930** or by E-mail **john@mi0aaz.force9.co.uk**

September 6: The Annual Wight Wireless & Computer Rally will be held at the National Wireless Museum, Arreton Manor, Newport, Isle of Wight. Admission is free and so is the parking. **Douglas G3KPO** on **(01983) 567665**.

September 6: The Bury Radio Society's 14th Annual Rally will be held at the Castle Armoury (TA Centre), Castle St., Bury. Doors open 1030 (1000 for disabled visitors). Talk-in on **S22**, Morse tests, Bring & Buy and all the usual traders. Further information and booking forms from **Alan G0RFE** on **(01706) 621263** or via E-mail: **g0rfe@zen.co.uk**

September 12: Reddish Rally is to be held at St Mary's Parish Hall, Reddish, Stockport. More information from **John G4ILA** on **0161-477 6702**.

September 12: The 4th Northampton Radio & Computer Rally is to be held at the heart of the Shires Shopping Village Showground on the A5, just two miles north of Weedon, with easy access. Rally opens at 0900. There will be a Bring & Buy, organised by the Northampton Radio Club. Bring the family as they can spend the day in the 'ole worlde' village. Refreshments and toilets are on site. Admission is only £1. Contact **Steve M0ARZ** or **Paul G0HWC** on **(01604) 632478**.

September 13: The 1998 BARTG Rally will be held at Sandown Exhibition Centre, Esher, Surrey. Doors open 1030. Attractions include free parking, Bring & Buy, many trade stands, a licensed bar and catering. **DataStream 98** forms an integral part of this Rally. **DataStream 98** will consist of a series of lectures looking at various aspects of amateur radio data comms. More info. from **Alan Hobbs G8GQJ**, 83 St Peters Street, South Croydon, Surrey CR2 7DG, **0181-688 2564** (evenings) or **http://www.bartg.demon.co.uk/rally.htm** or E-mail: **rally@bartg.demon.co.uk**

Send your news to Zoë Crabb at the Editorial Offices

Maplin Joins National Society

Maplin has become a member of the Radio Society of Great Britain (RSGB). This further underlines the chain's commitment to the amateur radio and hobbyist electronic markets.

Representing UK radio amateurs at national and international level, the RSGB was formed in 1913. With 30 000 members world-wide, the society negotiates on behalf of UK radio amateurs with the DTI's Radiocommunications Agency to protect UK amateur radio bands from commercial pressure and works to improve licence facilities.

Marcia Brimson, the RSGB's Marketing & Sales Manager commented "We are very pleased to be working with Maplin. Their membership of the society will allow closer links to be forged.

At the moment there are many radio enthusiasts listening to world radio transmissions who don't know how easy it is to get involved in amateur radio and learn how to transmit themselves. The RSGB and Maplin will be working together to provide more information to customers about amateur radio and the equipment needed, with the aim of broadening the hobby".

Customers can pick up free, specially prepared RSGB information packs at one of the 48 Maplin stores nationwide. The packs include information on the society and how to get involved in amateur radio, together with membership details.

For further information and store locations, contact (01702) 554002.

RAE/MORSE COURSES

The **Sandwell Amateur Radio Club** are running RAE examination classes (both full and Novice) in September 1998. Enrolment is on Thursday September 3rd 1998 and classes commence on Thursday September 10th 1998. Classes take place at the club premises, The Broadway, Warley, Oldbury, West Midlands. More information on 0121-552 4902, 0121-429 6061 or 0121-532 7039.

The **Widnes & Runcorn Amateur Radio Club** will be running an RAE and Novice RAE course at The Beacons, Simmons Lane, Frodsham, Cheshire. Enrolment takes place on Friday 4th September 1998 from 1930. Further details from course tutors **Dave Bibby G1PIX** on (01928) 591401 and **Dave Wilson G7OBW** on (01270) 761608.

The **Bradford & Ilkley Community College**, Bradford, West Yorkshire, are running an RAE course in the dept. of engineering. Enrolment is the first week in September and classes are on Tuesdays, 1800-2100. The course tutor is **Ralph Turner G3VRX**. Call (01274) 753371 for more information.

The **Glenrothes & DARC** will be offering classes for preparation for the RAE and Morse tests beginning late September 1998. RAE classes will be on Monday evenings at 1930 at Balwearie High School, Kirkcaldy. Morse classes will be held on Tuesday evenings at 1900, also at Balwearie High School, and the course is designed for both beginners and advanced. Enrolment will be Monday 28 September 1998, 1900-2000. More information for both courses can be obtained from **Ken Horne GM3YBQ** on (01592) 265789 (evenings, after 1900).

An RAE course is to be held at **Newstead Woods School**, Avebury Road, Orpington, Kent on Monday evenings at 1930-2130, commencing 14 September. The course leads to the May 1999 exam, which will be held at the school. For information regarding enrolment, post to: **Bromley Adult Education College, Church Lane, Prince's Plain, Bromley BR2 8LD, Tel: 0181-462 9184**. Course tutor will

be **A.E. Betts** and he can be contacted on (01689) 831123.

Ray Oliver G3NDS is again running RAE courses at **The Newbury Technical College** commencing Thursday 10 September 1998, 1900-2100 (course no: 99018A). A Morse code for amateurs (RSGB 12w.p.m.) starts Tuesday 5 January 1999, 1900-2030 (course no: 99208B). Telephone (01635) 35353 for more information. An RAE course is also being run at the **Swindon Technical College**, commencing Monday 21 September 1998, 1900-2100 (course no: UFF30S). Telephone (01793) 498300. In addition, Ray is also organising two practical electronics courses at Newbury College that might be of interest to those wishing to gain skills in constructing and testing their own equipment.

Practical Electronics: (course no: 99032A) starts 16 September 1998, 1900-2100, basic electronic theory with practical emphasis on components, circuit construction and testing.

Electronic Construction for Radio Amateurs: (course no: 99571C) starts 13 May 1999. This is a short course specifically for radio amateurs/s.w.l.s to assist those in wishing to construct and test their own radio projects. Contact the Newbury College on the number above or call Ray G3NDS on (01672) 870892.

The **North Cheshire Radio Club** will be taking enrolments and starting both their RAE and NRAE course on Sunday evening, 13th September 1998 at 1900. These will take place every Sunday thereafter at their HQ, the Morley Club, Moberley Road, Morley Green, Wilmslow, Cheshire. Further details from the Education Officer **Gordon L. Adams G3LEQ** on (01565) 652652 or FAX: (01565) 634560.

The **Warrington Collegiate Institute** will be taking enrolments on the 3rd, 4th and 5th September and thereafter, and the RAE lectures start at 7pm on Thursday 17th September 1998 and every Thursday thereafter at the Winwick Road Campus, Warrington, Cheshire. Further details from the Institute on (01925) 494494 or from **Gordon L. Adams G3LEQ** (Lecturer) on (01565) 652652.

HIGH PERFORMANCE RANGE

Mitsubishi Electric announce the introduction of its high performance range of internally matched GaAs f.e.t.s designed specifically for L and S-bands. The complete f.e.t. range comes in high reliability sealed metal ceramic packaging and generates high output power making the devices ideal for digital radio links, base stations and wireless local loop applications.

Four Class A operation devices comprise the range. MGFL45V1920 provides 30W output power with a high power gain of typically 13dB for 1.9-2.0GHz applications. MGFS45V2123 for 2.1-2.3GHz, MGFS45V2325 for 2.3-2.5GHz and MGFS45V2527 for 2.5-2.7GHz. All provide 30W output power with a high power gain of typically 12dB.

All devices are internally matched to 50Ω and boast an extremely high power added efficiency of 45% over their respective wavebands and low distortion figures of typically 45dBc at output powers of 34.5dBm. Typical electrical characteristics of the devices



Mitsubishi launches high output power internally matched GaAs f.e.t. L&S band amplifiers for digital radio applications.

include a saturated drain current rating of -5V maximum and 45dBm output power at 1dB gain compressions. Third order intermodulation distortion is typically -45dBc and thermal resistance is 1.7°C/W.

More information from **Mitsubishi Electric Europe BV, Semiconductors, Travellers Lane, Hatfield, Herts AL10 8XB, Tel: (01707) 276100, FAX: (01707) 278997, Web: <http://www.mitsubishichips.com>**

CONTACT POINT

Feba's latest video, **Point of Contact**, is now on release. The video visits Feba's Seychelles station to look at how it all happens, then moves to the reception areas to see what is being achieved.

Producer Geoff Martin says, "Feba ministry is exciting and we were determined to reflect that in what we filmed. That meant hiring top mission video cameraman Crawford Telfer, and

using a helicopter for aerial shots in Seychelles.

We asked ex-ITV producer Tim Dehn (now with Feba Zimbabwe) to do a 'listener safari' in Zimbabwe and Ed Larby of Feba's Middle East team to activate his TV contacts there. It's taken a lot of time and effort to pull it all together but it's nice to view the finished video and truly we feel we couldn't have done any better".

As a result, video viewers meet Feba listeners,



Video cameraman Crawford Telfer gets set for some aerial filming over Feba Radio's offshore installations in Seychelles.

producers, engineers and programming strategists. They hear something of how today's electronic developments and the advent of Internet communications are bringing change, diversity and new challenges to the way Feba broadcasters approach their task.

Feba have also produced a short version of **Point of Contact**, intended for use in church services, group meetings and on any occasion when time is short. This appears on the same videotape, straight after the main 19 minute video. **Point of Contact** can be borrowed (or purchased at £9.75 inc. UK P&P & VAT) from **Jennie Ring** at **Feba Radio, FREEPOST, Worthing West Sussex BN14 7BR.**

HEADPHONE ADAPTOR

Isoplethics IHA1-1 headphone adaptor has been developed to allow modern 32Ω stereo headphones to be used in high impedance applications. Using the IHA1-1, an impedance of around 8kΩ is obtained, with a sensitivity approaching that of 1950s Brown Type F 4kΩ headphones. (Modern stereo headphones vary considerably in sensitivity. This performance is obtained on examples having a sensitivity exceeding 100dBm.

By careful transformer design, the peaky response of metal-diaphragm headphones has been simulated to give good c.w. and communications-grade telephony performance. Additional internal filtering limits h.f. response to around 3kHz to reduce noise levels. Internal clipping limits noise spikes to a safe level. This filtering has been achieved without sacrificing sensitivity. The input is shunted to eliminate 'threshold howl' in regenerative detectors.

The IHA1-1 is ideal for use with simple receivers, especially valve t.r.f.s and crystal sets and gives good results with older valve receivers and test equipment such as the BC221 frequency meter. The IHA1-1 is housed in a custom, black, isophthalic resin-moulded box of traditional design, output is via a 6.35mm (1/4in) standard stereo socket and the input is a 300mm flying lead terminated in a mono 6.35mm jack. IHA1-1 headphone adaptors, together with a comprehensive data sheet are available ex-stock direct from **Isoplethics, 13 Greenway Close, North Walsham, Norfolk NR28 0DE**, priced at £14.90 each, inclusive of VAT and P&P within the EU.

The new Isoplethics IHA1-1 headphone adaptor.



40TH ANNIVERSARY CONFERENCE

The Brunel Manor Christian Conference Centre, near Torquay in Devon, is the setting for the 40th Anniversary Conference of the **World Association of Christian Radio Amateurs and Listeners (WACRAL)**. The event is to be held over the weekend of **2/4th October 1998** and is open to all Christian enthusiasts who are invited to join members for a full and varied programme of radio related events, lectures, services and general fellowship.

A special presentation and demonstration will be made by **David Palmer G4PFX** and **John Corbett G3TWS** entitled 'Satellite Communications in the Congo'.

David Wiltshire of the charitable organisation 'HoverAid', a Christian concern dedicated to overcoming communication and transportation problems in developing areas by the use of specialised hovercraft, will guide the Conference - 'In the Footsteps of Livingstone'.

Parallel tuition sessions will offer Novice Instruction and DXing for absolute beginners, a simple construction competition and a private visit to the Brixham lifeboat and coastguard station are just a few of the attractions lined up to complement the WACRAL AGM and Services of worship.

If you would like to find out more, contact **Geoff Peterson G4EZU** at **124 Darnley Road, Gravesend, Kent DA11 0SN**, Tel: **(01474) 533686** or E-mail: **geoff.peterson@zetnet.co.uk**

rallies

September 13: The Milton Keynes & District Amateur Radio Society are holding their Annual Rally and Boot Sale in Bletchley Park. More information from **Dave White G3ZPA** on (01908) 501390.

***September 13:** The 13th Lincoln Hamfest will be held on the Lincolnshire Showground. This is on the A15 just five miles North of the City. Talk-in on 70cm. There is extensive parking available on the day and overnight on the 11/12th for caravans and tents. There will be many trade stands, a Bring & Buy, Flea Market and Car Boot Sales. More tests will be available by arrangement, there is also catering and a licensed bar. Admission is £2, (free for those 14 and under). **John & Sue** on (01522) 525760 or John (mobile) on (0385) 738976.

September 20: The Cambridge & District Amateur Radio Club are holding their Car Boot Sale in the Reindeer Pub grounds, Saxon Street, Near Newmarket. Open from 1100 till 1500, entrance fee is 50p, pitches are from £5, depending on vehicle size. More information from **Michael Adlessee**, Public Relations Officer, on (01223) 872258, or visit the web site, which contains a current club programme, <http://peach.cam-ori.co.uk/cdarweb/>

September 20: The Mansfield Amateur Radio Society's first Radio, Computer and Electronics Car Boot Sale is to be held at Debdale Lane Sports & Social Club, Debdale Lane, Mansfield Woodhouse, from 1000 to 1600. Talk-in on S22, ample parking. **Angela G1DZH** on (01623) 429218.

September 20: Their will be an Electro-Jumble Sale (4th) to be held at The South Yorkshire Aircraft Museum. The organisers planned the event for constructors, restorers and collectors of electrical radio and radar equipment up to the 1950s and 1960s (both commercial and military), to buy, sell or swap pieces of kit, transmitters, receivers, components, connectors, cables, handbooks, test gear, etc. and those odds and ends you've had for years but cannot use and do not know what they are for! Starting time is 1000, setting up from 0800. Admission is free and so is the parking. More information from **Mike Diprose** on (01433) 631296 or **Mike Green** on (01253) 347176.

***September 25/26:** Leicester Amateur Radio Show will this year be held at the Donington International Exhibition Centre at Donington Park, Castle Donington, Leicestershire. Many traders have already reserved space at what will be the biggest UK Amateur Radio event this year. The hall itself is purpose built and features a floor area approximately one third larger than the two Granby Halls combined and the car parking is unlimited and free. There will be 150 stands and many new features such as camping and caravanning on site, a meeting room for clubs and societies and a convention. **Geoff G4AFJ** on (01455) 823344, FAX: (01455) 828273.

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

Send your news to Zoë Crabb at the Editorial Offices

ed's comments



t's summer at last and my timing seems, for once, to be spot on. As I type these words, I am actually on holiday, with Zoë and Jo 'holding the fort'. Due to the communication facilities available to me, seconds after I finish keyboard bashing, this collection of Editorial thoughts will be winging its way to the SWM offices.

Mariners around the world have, for seventy five years, enjoyed 'being in touch' too. Portishead Radio, the BT coastal station based on the Severn estuary coast in Somerset, last year celebrated its three quarter century anniversary. In the first quarter of 1999, the station is to close. A service that will be sadly missed by many users and listeners alike. Me for one.

I recently was fortunate enough to have a guided tour of the Portishead facilities at Highbridge. The main 'ops' room is a shadow of its former self. The heydays in the mid seventies saw hundreds of operators working the world. Now at the end of the century barely a handful visibly 'work out their time'.

I understand that things could have been very different for Portishead, as they were approached by the ever expanding Globe Wireless. I am uncertain of the details so I can't be specific, but it seems a tragedy that

this is the last complete year that Portishead will provide that important link between the traveller and home.

Speaking of closures, another loss to the radio community is the GCHQ outpost at Culmhead. After a period of 42 years distinguished service the station will also close next year. Yet another casualty of the cessation of the 'cold war'.

More Freebies

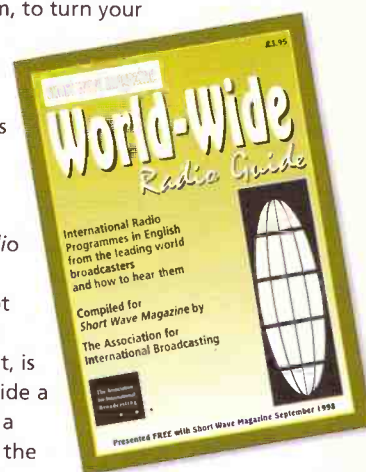
If you are a broadcast listener, and I know that a high proportion of you are, then I'm sure that you will enjoy the *World-Wide Radio Guide* pull-out booklet in this issue of *SWM*. This guide was

brought to you with the help of the AIB - Association of International Broadcasters.

I have recently had a letter from one reader who, in his enthusiasm for broadcast related topics, seems to have missed the point of this magazine. He wants me, it would seem, to turn your magazine, the one that covers a broad spectrum (literally) of topics for your reading pleasure, into a kind of international *Radio Times*.

Well, this is not what *Short Wave Magazine* is about, is it? We try to provide a wide coverage of a diverse section of the monitoring hobby.

Though I guess a few people take our historic title a little too literally. We strive to cover more than just short waves.



Reader Survey

I have had a few disgruntled readers contact me who are somewhat unhappy that last month's reader survey contained questions other than those related directly to *SWM* topics.

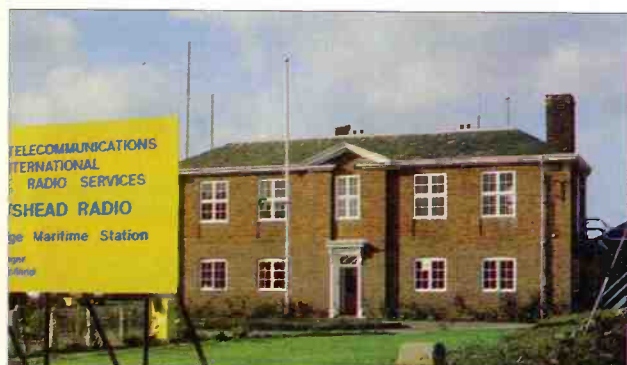
Since we are published by a small independent publisher, resources are rather limited. Tasks such as analysing thousands of survey forms is a task that we cannot undertake in-house. We just don't have the time to turn it around **quickly**. As a result of this, we have taken the approach that most other magazines take. We used an outside specialist company to run the questionnaire on our behalf. We supplied the *SWM* related questions and they do everything else, up to supplying the results. So the final questionnaire takes the form of that vast majority of other surveys you are likely to encounter.

You don't have to answer it, but I'd appreciate it if you did.

...now, where did I put that sun tan lotion and who's got my headphones?

Happy listening!

Kevin Nice



Just a reminder to one and all that **Badger Boards** can be contacted at: **12 Hazelhurst Road, Castle Bromwich, Birmingham B36 0BH, Tel: 0121-681 4168.**

A small catalogue containing a range of components, projects and p.c.b.s is available, free, to anyone sending **Roy or Sue Martin** an s.s.a.e.

Dear Sir

It gives me great pleasure to write this letter to you. I have been a regular reader of *Short Wave Magazine* since its re-launch in April 1987 and in that time I have purchased several books from the SWM Book Store.

On the 13th May 1998 I ordered a copy of the *Global Radio Guide 1998*. This I received, by return, with the date: January 1998 on the front cover. You can imagine my dismay when, on looking inside the guide, I saw an order form for the next issue, which was dated April 1998, thus making the copy I received this morning obsolete.

I sent a FAX to the Book Store explaining my problem and within fifteen minutes a gentleman from the Book Store 'phoned back with a full and satisfactory explanation, indeed I was so taken back with this prompt reply that I did not quite catch his name so could you say thank you once again to him for me.

I would just like to say how much I have enjoyed SWM over the years, while I concentrate almost wholly on the broadcast side, I have had no difficulty in the many other aspects on s.w.ling which, of necessity, a magazine like SWM must cover. I am particularly pleased with 'LM&S' now being at the front of the magazine.

Strangely, over the last couple of months, I have read more of the new broadcast side in SWM than I normally do.

To end this letter I have recently been given, as a present, a Realistic DX-394. At £99.99, it must be the buy of the year!

**Michael J. Astley
Crewe**

The very helpful gentleman to whom you refer, is none other than Michael, who, together with Shelagh, is responsible for the excellent service enjoyed by our Book Store customers. - Ed.

Dear Sir

I have been a s.w.l. for some 18 years, I have a variety of h.f./v.h.f./u.h.f. equipment, namely PRO-2005, PRO-2036, PRO-30, PRO-50, PRO-27, DX-394 and Yaesu FR-50B. As you can see, I tend to stick with equipment, if it works I keep it!

The point of my letter is over the years it has come to my attention that in the hobby of radio, things change so quickly. The 'black box of today' is the discarded box of tomorrow.

In my view, new is not necessarily better. I think that I am like most in our hobby. I have not the income to chop and change. Let's try and keep a happy medium in the pages of SWM.

Sure, show the latest and greatest but don't forget the large percentage of readers who are looking for something (maybe second-hand) at a lower price. No gripes about the magazine, but more radio and less computer. Keep *Short Wave Britain's* best Radio Magazine.

**J. Hepburn.
Northumberland**

We try! - Ed.

Dear Sir

I have a Lowe HF-150, an excellent receiver. Yes, the broadband front-end does allow in some unwelcome visitors from time to time, but that's not a problem unless it is a weak signal. So it was with great interest that I read in March SWM the review about the HF-150 Europa.

My interest increased to delight when, in the reviewer's summary, I read that an upgrade was possible to existing receivers for £200. I decided to do it - but needed to save cash. I checked with Matlock who said, "Just send the radio with the fee and it will be slotted into the production line".

So by July, just four months later, I had enough

Dear Sir

I must say how much I enjoyed 'A Unique Event', the article by Roy Clayton G4SSH about GB stations. I can personally vouch for the Scarborough Special Events Group's high standard of operating and a superb attitude to s.w.l. reports.

When I heard GB8SF in 1996, the huge pile-ups were expertly managed with lists being taken of calls with number 9, 8, 7, 6, 5, 4, 3, 2, 1, 0 and non-UK and non-European stations. Such was the efficiency of the process that stations who missed out on a list did not have to wait long for an opportunity to come around again.

After listening to GB8SF, I was perplexed whenever I heard a Special Event Station just taking one call at a time from a pile-up!

I sent my standard ISWL club card (I now have my own card) via the bureau. In return I got one of their highly attractive, limited edition, full colour QSL cards. What's more, it was sent to my address direct! They said that my comprehensive report, listing about 20 QSOs deserved a direct reply!

Yes, Scarborough Special Events Group Stations are indeed a joy to listen to for hours on end, and the more GB, DX or unusual call stations that adopt their good practice, the better!

**Tom Read G20843
Macclesfield**

TOP
QSL

money and rang Matlock to confirm the returns procedure, only to be flatly told: "Sorry, we have stopped making them here and we cannot do it."

However, I was given the 'phone number of SMC, where the new production line will be, who have said they may be able to help but in a few months time.

Short wave radio and amateur radio is a small, close knit interest group and people talk. Reputations are made and lost by service and attitude as well as the quality of products. I am disappointed that such an acknowledged popular offer was apparently such a short-lived one, and no published warning was given about its time limitations, and yes, I am sorry that an era has ended at Matlock.

**Geoff Crawford
Nottingham**

I'm sure there are a great many of our readers that will agree about the sad end of an era. It is seldom the case,

however, that commercial activities, such as the sale of brands is made public knowledge before the transfer has taken place. I Hope you can hang-on until SMC are able to perform the modifications - Ed.

Dear Sir

With respect to my article entitled 'A Unique Event' which you published in the August edition of SWM. Firstly, may I congratulate you on the presentation of the article, which was first class. Secondly, I am sure that you will be interested in the response - I have already received ten telephone calls from readers (my telephone number is printed in the *RSGB Callbook*) all expressing admiration for the full-colour impact of the article and thanking me for putting into words their own feelings with regard to Amateur Radio Special Event Stations and the listener.

It certainly appears to have been a popular subject, which has been very well received by the readers.

**Roy Clayton G4SSH
Scarborough**

Who said SWM has nothing to do with amateur radio? - Ed.

Dear Sir

After buying your magazine now for several years, I am sad to see that four pages are taken up with a Questionnaire, of which many of the questions have nothing to do with s.w.l. radio.

In a recent TV programme they showed how some firms sold the information they received and made big gains. I wonder if the information received from the *Short Wave Magazine* questionnaire is sold on, and if so, perhaps some of the profit could reduce the cost of the magazine.

There seems to be far too many adverts these days and far less information. Perhaps it would be a good idea to put all the information to the front of the magazine and all the adverts at the rear, then it would be so simple to read.

At the end of the day, *Short Wave Magazine* is still a good magazine.

**D. Price
Wellington**

I think that you'll find that the method we have chosen for collecting your's and our other readers' feedback, typical of the magazine industry as a whole. Please bear in mind there is nothing compelling you to provide information against your will. - KN.

Dear Sir

Being an older DXer, I started DXing in 1952 in New Zealand, I had been used to goods brought from UK suppliers taking up to three months to arrive by surface mail. It has been refreshing, since I've been in the UK, to be able to get first class service. But last week, I was even more surprised to receive what I would class as exceptional service from the 'Lynch Mob'.

After poking around their stand at Picketts Lock, I was impressed with the Icom IC-PCR1000 and had decided that when I needed a new receiver, I would get one.

Well, last week I rang Martin Lynch & Son to be told that it was on special. So, on the next Thursday, I posted off a bank cheque for the full price quoted to me. On Monday morning at 8.30am, I received the full package.

I was up and going by 11.30am. I had one small question and was given good advice on the 'phone, the staff also recommended a local shop in Northfield Avenue, who sent me an additional piece of equipment over night.

Great service all round!
**Dallas McKenzie
West Sussex**

■ Greg Baker, PO Box 3307, Manuka, ACT 2603, Australia

■ E-MAIL: greg@pcug.org.au

Bandscan Australia

Other News

The government has launched what it calls a Community Access Network to link 135 community radio stations and six community television stations across Australia. This package includes a network production fund to assist in the creation of on-line content and a community broadcasting database.

Funding at less than \$A1.5 million (£570,000) over three years seem meagre. To remove an anomaly, the government has changed the law to allow free to air broadcasters to demand a fee for the re-transmission of their signals. Until this change, pay television operators could re-transmit without payment.

Changes have been made to antennae on Canberra's Black Mountain tower to allow digital television trials to begin.

Technical people are keen to see whether existing infrastructure can be used successfully for simultaneous analogue and digital transmissions.

The government has formed a high-level group to co-ordinate the introduction of digital television in Australia. The group includes representatives from peak representative bodies in free to air and pay television, manufacturers and consumers.

In another related move, the Australian Broadcasting Authority (ABA), the planning authority for the transition to digital television, has signalled that it expects industry to bear the cost of ABA planning processes. In addition, the government has backed down in the face of opposition pressure and agreed to reduce the number of years that existing television stations would be protected from competition in the new digital era from eight to six.

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

This time I have news of **Radio Australia (RA) and telecommunications, which have been in the news a lot in the last few months. In addition I have some RA reception reports and a range of other news.**

Radio Australia

During, and after, the Indonesian crisis which led to the demise of President Soeharto, the government has come under heavy fire for its decision leading to the closure of the Cox Peninsula transmission facility near Darwin. The decision means that most of Indonesia is unable to receive the Indonesian language service through normal short wave channels.

The government has claimed that the signals are available via other means. Other means appear to be the weak signal from the Shepparton transmitters, the RA satellite signal or the recently introduced audio facilities in the Indonesian language on the Internet.

Unfortunately, very few Indonesians have access to satellite facilities and the reported 25000 hits per day on the RA Indonesian page <http://www.abc.net.au/ra/indon/indhome.htm> is tiny compared with the likely short wave audience. Many foreign affairs commentators are amazed that the government would choose to compromise Australia's national interest by enforcing the closure during turbulent times in Indonesia.

On the same topic, a report handed down by the Parliament's Joint Committee on Foreign Affairs, Defence and Trade said that the Cox Peninsula should be re-opened. It claimed that the saving of \$A1.6 million (approximately £610000) was small in comparison to the \$A13.5 million (£5 million) invested in the site in the last six years.

In addition, an internal ABC document leaked to the press here says that it would be cheaper to operate even a minimal service into Indonesia from the Cox Peninsula than to pay for the site to be kept mothballed.

RA QSL Information

Radio Australia can be QSLed to **Radio Australia Transmission Management Unit, GPO Box 428J, Melbourne 30001, Victoria, Australia.** If your establishment extends to a FAX the RA QSL FAX number is +61 3 9626 1878. RA also accepts reports by E-mail to ratx@radioaus.abc.net.au

To receive a QSL card of course you will need to include your postal address as QSLs are only sent by mail. Currently, QSLs should take from six to eight weeks. RA, on receipt of reception reports either by post, FAX or E-mail, filters them for those needing personal and individualised replies then bulks them up on a monthly basis for handling and answering by the ARDXC radio club.

The club verifies all reports and prepares QSL cards on a co-operative basis with RA, a

process that is particularly necessary now that RA funds have been slashed by the government. The ARDXC processing takes a couple of days and the cards are sent airmail from Australia or parcelled up in bulk for North America and the UK for local postage in those places. This latter process reduces overhead costs of the QSL process for RA.

Telecommunications

As noted here some time ago, the national telecommunications carrier Telstra has now passed from total public ownership and is one third privatised. The current government is keen to sell the remaining two thirds of Telstra, it says to retire government debt. However, the sale of Telstra appears unpopular within the community according to opinion polls.

In addition, in the lead up to the first tranche of privatisation, rural and remote Telstra services suffered. As a consequence, rural and remote users of telephones are concerned that a fully privatised Telstra will mean inadequate services in the bush.

The government - a coalition of two parties including the National Party, a rural based party - is treating this very seriously indeed, particularly in light of the emergence of a new party, One Nation, which has been very successful in National Party territory in Queensland state elections. The government has been offering some sweeteners - called the 'social bonus', in the hope of gaining its privatisation objective and of retaining the rural vote.

These sweeteners include the promise of untimed local calls for some sections of the bush, a part of Telstra long taken for granted in the city. The government says that 37000 households will benefit from this initiative which is expected to cost \$A150 million (£57 million).

Another sweetener that the government is taking credit for but for which Telstra itself has been working for some time, is the integration of analogue and digital mobile telephone networks. Telstra has invested \$A400 million (£152 million) in a new Code Division Multiple Access (CDMA) system which allows multiple telephone calls to be carried on a single frequency using encryption techniques. The new CDMA network will replace the 420 station analogue system to provide rural analogue users with a network which will enable them to benefit from the extended coverage in the bush now available to analogue mobile telephone users.

In addition, the new system will allow rural mobile users to use their handsets in the cities when the analogue system is phased out there. The downside for these users perhaps is the need to purchase new mobile telephone handsets.

Despite all these sweeteners, however, enough Senators remained unconvinced of government promises and voted down the bill intended to pave the way for full Telstra

privatisation. The government says that it will push ahead with its plans which it intends to put to the people at the next Federal election due before May 1999.

Radio

There has been some disquiet at the level of foreign ownership of Australia's radio stations according to a report in Australia's Age newspaper. The paper, reporting studies by Australia's Communications Law Centre, says that the largest regional network is foreign owned as is 50% of the second largest metropolitan network. The UK publisher and broadcaster, Daily Mail and General Trust, owns 53 stations across Australia including the largest rural radio network developed here by Rural Press.

Commercial radio stations are upset at the government's plans for the introduction of digital broadcasting. Commercial television interests will be protected from new competitors for six years after the introduction of digital television - see 'Bandscan Australia' June 1998 - while commercial radio interests will face competition from the start of the digital radio broadcasting era.

Spectrum Auction

The government has sold off more spectrum space in the 800 and 1800MHz bands making around \$A350 million (£133 million) in the process. The main player was Telstra purchasing around \$A177 million (£67 million) worth of spectrum. Mobile carriers Optus and Vodaphone bought spectrum to expand their digital networks, and new players AAPT, Hutchinson and OzPhone bought parts of the 800MHz spectrum, it is thought, to allow for them to set up a fourth mobile telephone network.

Radio Australia Reception

Martyn Gardiner from **Portsmouth** has been onto Radio Australia again but with mixed success. He has managed to bring in RA clearly on 9.500MHz in the evenings from 2130UTC until shutdown. Although he can make out this transmission before 2100UTC by using one sideband, he says that there is strong interference from another station.

Martyn has tried 15.415MHz and 17.750MHz in the mornings but with no success and the 11.660MHz signal in the afternoons is satisfactory from 1430-1500UTC but after that, another station interferes.

James Duckworth from **Herts** has got RA on 15.510, 15.415, 11.880, 17.750 and 9.710MHz all at around 0825UTC on 19 April. At other times he has pulled in RA on 15.415 and 15.510MHz at around 0635UTC and 21.725MHz at 0600UTC. James operates from home which he says is on the top of a 150m hill. His equipment includes an Eddystone 830/9 and a Grundig Satellite 700 run from a 11m longwire trailed around his attic.

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

LM&S

Getting away from it all may have more than one meaning for the listeners who reside in a city or town because a high level of electrical noise is always present in such places, which can make radio reception quite difficult. A holiday in a remote location may well provide them with an opportunity to search the bands in an 'electrically quiet' environment.

The details of your reception in the broadcast band during a recent holiday would be very welcome here for inclusion in this column. Please send them to me at the above address.

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.

Most of the channels in this band are shared by several stations. During daylight the ground waves from one or more of them may reach a point of reception but after dark the sky waves from some of the other occupants may arrive and it is that factor which makes monitoring each channel worthwhile.

David Stevenson has been doing just that in Swansea and at 0437UTC on June 11 he picked up a weak broadcast in Turkish under the Polish Raszyn Reserve transmission on **225kHz**. It probably came from the co-channel TRT 600kW outlet at Van, Turkey, but no ident was heard.

One of the most interesting channels is **189kHz**, which is shared by Tbilisi, Georgia (500kW) and Caltanissetta, Italy (10kW); also Gufuskalar, W.Iceland (300kW), which is a recent addition. Quite often **Brian Keyte** (Gt.Bookham) has received Gufuskalar after midnight - on June 23 he rated the transmission SINPO 34443 at 0030UTC. During some evenings the sky waves from Caltanissetta reach the UK. They were received between 2040 & 2100UTC on June 30 by **Fred Pallant** in Storrington. He clearly heard music and song followed by a conversation in Italian.

Medium Wave Reports

There was no indication in the reports that any of the broadcasts from m.w. stations in E.Canada and E.USA reached the UK at night during June. In contrast, the sky waves from some of the m.w. stations in the Middle East, N.Africa, Europe and Scandinavia did reach the UK at night - see chart. Nevertheless the conditions were noted by **Eddie McKeown** (Newry) and others as poorer than expected.

Good reception of BBC R.Gloucestershire via the new 500W outlet at Stow on the Wold on **1413kHz** was noted during daylight by **John Court** in Birmingham. Following a report to the station he received a letter of confirmation in early June. Reports from other areas would be welcomed by the station engineer. Send them to **Mr Roy Preece, BBC Radio Gloucestershire, London Road, Gloucester GL1 1SW**.

Short Wave Reports

Much to the disappointment of some listeners the **25MHz (11m)** band remained unused during June.

In contrast, the **21MHz (13m)** band was a hive of activity during daylight. The occupants therein include DW via **21.680** (Eng to Africa 0600?-0650?) rated 43343 at 0616 by **Chris Shorten** in Norwich; **UAER, Dubai 21.605** (Ar to Eur 0615-1030) 44444 at 0936 by **David Hall** in Morpeth; **UAER, Dubai 21.605** (Eng to Eur 1030-1100) 25343 at 1038 by **Tony**

Hall in Freshwater Bay; R.Portugal Int via Sines **21.720** (Port to Africa 0900-1100) 55555 at 1040 by **Sheila Hughes** in Morden; **RAI Rome 21.520** (It to Africa 0600-1300) 23222 at 1207

Thomas Williams in Truro; Vatican R, Italy **21.850** (It to S.America 1200-1230) **23343** at 1220 by **Robert Hughes** in Liverpool; R.Prague via Rimavska Sobota **21.745** (Eng to E.Africa, M.East 1300-1330) 43323 at 1300 by **Bernard Curtis** in Stalbridge; BBC via Ascension Is **21.660** (Eng to Africa 1100-1700) 33333 at 1305 by **Robert Connolly** in Kilkeel; DW via Wertachtal **21.705** (Ar to M.East 1300-1559) 54454 at 1309 in Newry; RFI via Issoudun? **21.580** (Fr to S.Africa 0900-1600) 43444 at 1319 by **John Eaton** in Woking; BBC via Cyprus **21.470** (Eng to E.Africa 1400-1700) 35434 at 1440 by **Simon Hockenhill** in E.Bristol; R.Portugal Int via Sines **21.655** (Port to Brazil 0800-2100) SIO433 at 1455 by **Philip Rambaut** in Macclesfield; **RAI Rome 21.535** (Tt [Football]) to Lat Amer, Africa 1330-1700, Sun only) 44444 at 1539 by **Rhoderick Illman** in Oxted; WYFR via Okeechobee, USA **21.525** (Eng, Fr, Port to Eur, Africa 1600-2000) 34433 at 1609 by **Darren Beasley** in Bridgwater; DW via Kigali, Rwanda **21.560** (Ger to M.East 1400-1755) 45333 at 1630 by **Ernest Wiles** in NE.Bedford; **UAER, Dubai 21.605** (Eng to Eur 1600-1640) 54444 at 1635 by **Stan Evans** in Herstmonceux; **HCBJ Quito, Ecuador 21.455** (Eng [u.s.b. + p.c.] to Eur 1900-2200) 22222 at 2043 by **Richard Reynolds** in Guildford.

The new **18MHz (15m)** band is being used by Christian Science BC to reach listeners in C.Africa. Their transmission via WSHB Cypress Creek, USA on **18.930** (Eng 1700-1800 Tues, Thur, Sat) was rated 44344 at 1745 by **Vera Brindley** in Woodhall Spa.

Noted in the **17MHz (16m)** band during the morning were R.Australia via Shepparton **17.750** (Eng to Asia 0600-0900), rated 25532 at 0730 by **David Edwardson** in Wallsend; DW via Rwanda? **17.800** (Eng to Africa 0900-0950) 44333 at 0904 in Oxted; R.Austria Int via Moosbrunn **17.870** (Eng, Ger to Australasia 0930-1030) 44434 at 0930 in Truro; **AIR via Bangalore 17.387** (Eng to Pacific areas 1000-1100) 33222 at 1010 in Morden; R.Pakistan, Islamabad **17.835** (Eng to Eur 1100-1120) 44343 at 1104 in Freshwater Bay, IoW; R.Sweden, Stockholm **17.870** (Eng to USA 1130-1200) 45544 at 1145 in Bridgwater; R.Bulgaria, Sofia **17.585** (Eng to Eur 1100-1200) 44444 at 1155 in Herstmonceux.

During the afternoon R.Romania Int **17.770** (Eng to Eur? 1300-1356) was 43232 at 1307 in Newry; DW via Wertachtal **17.845** (Ger to S/SE.Asia 0600-1355) 33233 at 1315 in Liverpool; REE via Noblejas? **17.755//17.715** (Sp to S.America 0900-1900) 45444 at 1320 in Woking; Channel Africa via Meyerton **17.675** (Eng to W.Africa 1300-1455 Sat/Sun) 44444 at 1410 by **Bill Griffith** in W.London; BBC via Ascension Is **17.830** (Eng to W/C.Africa 0730-2100) 33553 at 1430 by **John Parry** in Larnaca, Cyprus; RCI via Sackville, Canada **17.820** (Eng, Fr to Eur, Africa 1330-1500 Mon-Sat) SIO333 at 1500 in Macclesfield; Africa No.1, Gabon **17.630** (Fr to W.Africa 0700-1100, 1200-1600) 55544 at 1504 by **Martin Goodey** in St.Mary's, Isles of Scilly.

Later, VOA via Morocco **17.895** (Eng to Africa 1600-1900) was 43545 at 1800 in NE.Bedford; Israel R, Jerusalem **17.545**

LONG WAVE CHART

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	I*
153	Donebach DLF	Germany	500	A,B,D*,E,F,G,H*,I,J
162	Allouis	France	2000	A,B,D*,E,F,G,H*,I,J
171	Nador Medi-1	Morocco	2000	A,F
171	B'shakovo etc	Russia	1200	A*,D*,E,F,G*,J
171	Lvov	Ukraine	500	B*,G*
177	Oranienburg	Germany	750	A,B,D*,E,F,G,I,J
183	SaarLouis	Germany	2000	A,B,D*,E,F,G,H*,I,J
189	Gufuskalar	W.Iceland	150	C*
189	Caltanissetta	Italy	10	F
198	Droitwich BBC	UK	500	A,B,D*,E,G,H*,I,J
207	Munich DLF	Germany	500	A,D*,E,F,G,I*,J
207	Azilal	Morocco	800	F
216	Roumoules RMC	S.France	1400	A,D*,E,F,G,H*,I,J
225	Raszyn Resv	Poland	?	A,B*,E*,F,G*,H*,I*
225	Van TRT-1	Turkey	600	I*
234	Beidweiler	Luxembourg	2000	A,B*,D*,E,F,G,H*,I,J
243	Kalundborg	Denmark	300	A,D*,E,F,G,I,J
252	Tipaza	Algeria	1500	E*,B*,I*
252	Atlantic 252	S.Ireland	500	A,B*,D*,E,F,G,H*,I,J
261	Burg(R.Ropa)	Germany	200	A,B*,E,G*,I*,J
270	Topolna	Czech Rep.	1500	A,B*,D*,E,F,G,H*,J
279	Sasnovy	Belarus	500	B*,E,G*

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

Listeners:-

- (A) John Eaton, Woking.
- (B) Sheila Hughes, Morden.
- (C) Brian Keyte, Gt.Bookham.
- (D) Eddie McKeown, Newry.
- (E) George Millmore, Wootton, IoW.
- (F) Fred Pallant, Storrington.
- (G) Harry Richards, Barton-on-Humber.
- (H) Tom Smyth, Co.Fermanagh.
- (I) David Stevenson, Swansea.
- (J) Phil Townsend, E.London.

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FINANCE EXAMPLE

All examples do not include P&P.

Cash Price	10% Deposit	36 Months@	Total Credit	APR
£289.00	£29.00	£9.44	£368.84	19.9%

Written quotations available on request

(Heb [Home Sce rly] to W.Eur, N.America 0500-1855) 44444 at 1815 by **Vic Prier** in Colyton; WHRI South Bend, USA **17.655** (Eng to E.U.S.A, Eur 1500-2300) 23333 at 1900 by **Gerald Guest** in Dudley; HCJB Quito, Ecuador **17.735** (Eng to Eur? 1900-2300?) 44344 at 2000 by **Clare Pinder** in Appleby; R.Nederlands via Bonaire, Ned Antilles **17.605** (Eng to Africa 1830-2025) 25333 at 2005 in Storrington; RCI via Sackville **17.870** (Eng to Eur, M.East, Africa 2000-2100) 54444 at 2010 by **Tom Winzor** in Plymouth; WYFR via Okeechobee, USA **17.555** (Ger, Eng to Eur, Africa 1900-2200) 34433 at 2012 in Morpeth; VOA via Greenville, USA **17.725** (Eng to Africa 2000-2200) 33333 at 2055 in Stalbridge; R.New Zealand Int **17.675** (Eng to Pacific areas? 2052 [2107 Fri/Sat] -0457) 35333 at 2104 in Guildford; R.Taipei Int via WYFR **17.750** (Eng to Eur 2200-2300) 55545 at 2246 by **Martin Cowin** in Kirkby Stephen; RFI via Allouis? **17.620** (Sp to C.America 2300-0000?) 22322 at 2325 in Kilkeel.

In the **15MHz (19m)** band the BBC via Masirah Is, Oman **15.310** (Eng to S.Asia 0300-0915, 1000-1400) was 34533 at 0400 in Wallsend; BBC via Seychelles **15.420** (Eng to E.Africa 0400-0630 Mon-Fri, 0400-0700 Sat, Sun) 24552 at 0540 in Larnaca, Cyprus; Voice of Malaysia, Kajang **15.295** (Eng to Asia 0455?-0825?) 34433 at 0610 in Guildford; Voice of Nigeria via Ikorodu **15.120** (Eng 0500-0700) SIO444 at 0630 by **Tom Smyth** in Co.Fermanagh; Christian Science SWB via KHBI N.Mariana Isles **15.665** (Eng to Eur 0800-0900) 35433 at 0830 in Bridgwater; R.Pakistan, Islamabad **15.530** (Eng to Eur 1100-1120) 54444 at 1103 in Norwich; R.Oman via Thumrait **15.140** (Ar to M.East 0800-1600) 32232 at 1151 in Newry; BBC via Cyprus **15.575** (Eng to M.East, E.Eur 0400-1500) 44433 at 1200 in Herstonmouceux.

During the afternoon WEWN via Vandiver, USA **15.745** (Eng to Eur 1000-2200) was rated 44444 at 1258 by **Martin Dale** in Stockport; RCI via Sines, Portugal **15.325** (Eng to Eur, M.East, Africa 1330-1400) 44444 at 1330 in Truro; UAER, Dubai **15.395** (Eng to Eur 1330-1355) 54544 at 1330 in W.London; R.Romania Int **15.390** (Eng to Eur 1300-1356) 54444 at 1342 in Freshwater Bay, IoW; WINB Red Lion, USA **15.715** (Eng to Eur, N.Africa 1500-1900?) 21111 at 1515 in Liverpool; VOIRI Tehran, Iran **15.084** (Home Sce relay) 44334 at 1700 in Colyton; R.Norway Int, Oslo **15.220** (Norw to C/S.Africa 1700-1730) SIO555 at 1729 in Macclesfield; R.Sweden via Horby **15.735** (Eng to Eur? 1730-1758) 44344 at 1737 in Woodhall Spa.

Later, Channel Africa via Meyerton **15.240** (Eng to W.Africa 1800-1830) was 23223 at 1800 in Dudley; R.Nederlands via Bonaire, Ned.Antilles **15.315** (Eng to Africa 1830-2025) 22243 at 1838 by Michael Casey in Manchester; VOA via Morocco **15.410** (Eng to Africa 1600-2000) 35454 at 1839 in Storrington; R.Algiers Int, via Bouchaoui **15.160** (Eng,Sp to Eur, M.East, N.Africa 1600-2000?) 44444 at 2000 by Peter Pollard in Rugby; Voice of Russia **15.485** (Eng [WS]) 45445 at 2000 in E.Bristol; Voice of Indonesia, Jakarta **15.150** (Eng to Eur, Africa 2000-2100) 44444 at 2015 by **Adam Farnsworth** in Bridgnorth; WWCR Nashville, USA **15.685** (Eng to N.America, Eur 1100-2200) 44333 at 2024 in Woking; VOA via Botswana? **15.445** (Eng to Africa 1900-2200) 54444 at 2032 in Plymouth; R.Cairo, Egypt **15.375** (Eng to W.Africa 2030-2200) 33343 at 2045 in Oxted; RCI via Sackville **15.325** (Eng to Eur, Africa 2000-2129) 55555 at 2058 in St.Mary's, IoS; Christian Science SWB via WSHB **15.665** (Eng to Eur 2100-2200) 43333 at 2115 in Stalbridge; AWR-Asia via KSDA Guam **15.310** (Eng to NE.Asia 2130-2200) 22212 at 2130 in Morden; R.Taipei Int via WYFR **15.600** (Eng to Eur 2200-2300) 44444 at 2200 in NE.Bedford; RAE Buenos Aires, Argentina **15.345** (Sp to S.America 0000?-0100?) 34443 at 0045 in Kilkeel.

R.Australia has been reaching the UK well in the **13MHz (22m)** band during the early morning. Their broadcast to Pacific areas on **13.605** (Eng 0000-0800) was rated SIO444 at 0517 by Francis Hearne in E.Bristol. Also mentioned in the reports were Vatican R, Italy **13.765** (Eng to Africa 0630-0700) rated 35354 at 0630 in Manchester; R.Austria Int via Moosbrunn **13.730** (Eng to Eur 0730-0800) 55454 at 0745 in Herstonmouceux; UAER, Dubai **13.675** (Ar to Eur 0615-1030) 55534 at 0835 in St.Mary's, IoS; SRI via Sottens? **13.685** (Eng,

LOCAL RADIO CHART

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener	Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	B,C,G,H,J	1260	Brunel CG, Bristol	I	1.60	J
585	R.Solway	B	2.00	A	1260	R.York	B	0.50	A
603	Cheltenham R.	I	0.10	A,G,H,J	1296	Radio XL,Birmingham	I	5.00	A,G,H,J*,K
603	Capital G,Litt'brne	I	0.10	C,G,H,K	1305	Magic AM,Barnsley	I	0.15	A
630	R.Bedfordshire(3CR)	B	0.20	B,C,F,G,H,K	1305	Premier via ?	I	0.50	C,G,H,J*
630	R.Cornwall	B	2.00	A,H,J	1305	Touch AM, Newport	I	0.20	H,J
657	R.Ciwyd	B	2.00	A,G,H,J,K	1323	Capital G,Southwick	I	0.50	C,G,H,K
657	R.Cornwall	B	0.50	A,B,H,J	1323	SomersetSnd,Bristol	B	0.63	A,J
666	Gemini AM, Exeter	I	0.34	A,G,H,J	1332	Premier, Battersea	I	1.00	C,G,H,J*
666	R.York	B	0.80	A,G,K	1332	CI.Gold 1332,Pt'bo	I	0.60	A
729	BBC Essex	B	0.20	C,E,G,H,K	1332	Wiltshire Sound	B	0.30	H
738	Hereford/Worcester	B	0.037	A,B,D,E,G,H,J*,K	1359	The Breeze,Chelms'd	I	0.28	G
756	R.Cumbria	B	1.00	A	1359	CI.Gold C9,C'try	I	0.27	G
756	R.Maldwyn, Powys	I	0.63	G,H,J	1359	R.Solent	B	0.85	C*,H
765	BBC Essex	B	0.50	C,E,G,H	1359	Touch AM, Cardiff	I	0.20	J
774	R.Ken.	B	0.70	C,G,H,K	1368	Southern Counties R	B	0.50	B,C*,G,H,J*,K
774	R.Leeds	B	0.50	A,G	1368	Wiltshire Sound	B	0.10	H
774	CI.Gold 774, Glos	I	0.14	A,G,H,J	1413	R.Gloucester via ?	B	0.50	B
792	CI.Gold 792, Bedford	I	0.27	C,E,G,K	1413	Premier via ?	I	0.50	C*,G,H,J*
792	R.Foyle	B	1.00	A,I	1413	Yks Dales R,Skipton	I	0.10	A
801	R.Devon & Dorset	B	2.00	A,D,G,H,J,K	1431	The Breeze,Southend	I	0.35	C,G,K
828	CI.Gold 828, Luton	I	0.20	C,G,K	1431	CI.Gold, Reading	I	0.14	G,H
828	ZCR CG, Bournemouth	I	0.27	H,J	1449	R.Peterboro/Cambs	B	0.15	A,G,H
828	Townland R, Ulster	I	0.80	A	1458	R.Cumbria	B	0.50	A
837	R.Cumbria/Furness	B	1.50	A	1458	R.Devon & Dorset	B	2.00	A,H,J
837	Asian Netwk Leics	B	0.45	A,C,G,H,K	1458	Sunrise, London	I	50.00	C*,G,H,J*
855	R.Devon & Dorset	B	1.00	C,H,J	1458	Asian Netwk Langley	B	5.00	C
855	R.Lancashire	B	1.50	A	1476	CountySnd,Guildford	I	0.50	A,B*,C*,F*,G,H,J*,K
855	R.Norfolk, Postwick	B	1.50	C,G,K	1485	CI.Gold, Newbury	I	1.00	G
855	Sunshine 855,Ludlow	I	0.15	B,G,J	1485	R.Merseyside	B	1.20	A,H,I
873	R.Norfolk, W.Lynn	B	0.30	C,G,H,K	1485	Southern Counties R	B	1.00	B,C,G,H,K
936	Brunel CG, W.Wilts	I	0.18	C,G,H,J*	1503	R.Stoke-on-Trent	B	1.00	A,C*,F*,G,H
936	Yks Dales R, Howes	I	1.00	A	1521	Heartbeat 1521,AM,NI	I	0.50	A,I
945	CI.Gold GEM, Derby	I	0.20	A,B	1521	Fame 1521, Reigate	I	0.64	C,G,H,K
945	Capital G, Bexhill	I	0.75	C,G,H,K	1530	R.Essex	B	0.15	C,E,G,H,K
954	Gemini AM, Torquay	I	0.32	G,H,J	1530	CI.Gold W.Yorks	I	0.74	A,G
954	CI.Gold 954, H'ford	I	0.16	C*,G	1530	CI.Gold Worcester	I	0.52	A,G,H
963	Asian Sd,Manchester	I	0.80	A	1548	R.Bristol	B	5.00	H,J
963	Liberty R, Hackney	I	1.00	A,C,G,H	1548	Capital G, London	I	97.50	C*,G,H
972	Liberty R, Southall	I	1.00	C,G	1548	Magic AM,Merseyside I	I	4.40	A
990	R.Devon & Dorset	B	1.00	A,G,H,J	1548	Forth AM, Edinburgh	B	2.20	B
990	CI.G.WABC,Wolv'ton	I	0.09	B,G	1557	R.Lancashire	B	0.25	A
999	C.Gold GEM Nott'ham	I	0.25	G	1557	Mellow, Clacton	I	0.125	G
999	Red Rose 9-99 P'stn	I	0.80	A	1557	CI.Gold 1557,N.hant	I	0.76	G,K
999	R.Solent	B	1.00	C,E*,G,H,K	1557	Capital G, So'ton	I	0.50	C*,G,H
999	Valleys R, Aberdare	I	0.50	J*	1584	KCBC, Kettering	I	0.04	B,E*
1017	CI.G.WABC,Shrewsb'y	I	0.70	A,G,J*,K	1584	London Turkish R	I	0.20	C,G
1026	R.Cambridgeshire	B	0.50	B,C,G,K	1584	R.Nottingham	B	1.00	E*,G
1026	Downtown, Belfast	I	1.70	A,I	1584	R.Shropshire	B	0.50	A,G
1026	R.Jersey	B	1.00	G,H,J	1602	R.Kent	B	0.25	B,C,E*,G,H,K
1035	RTL Country 1035	I	1.00	B,C,G,H,J*					
1035	R.Sheffield	B	1.00	A					
1035	N.Sound 2, Aberdeen	I	0.78	A,G*					
1116	R.Derby	B	1.20	A,B,G					
1116	R.Guernsey	B	0.50	C,G,H,J					
1116	Valleys R,Ebbw Vale	I	0.50	J*					
1152	LBC 1152 AM	I	23.50	C,G,H					
1152	Pic'ly 1152,Manch'r	I	1.50	A					
1161	R.Bedfordshire(3CR)	B	0.10	C,G,K					
1161	Brunel CG, Swindon	I	0.16	A,G					
1161	Magic AM,Humberside	I	0.35	A					
1161	Southern Counties R	B	1.00	C,G,H					
1170	GNR, Stockton	I	0.32	A					
1170	Capital G,Portsm'th	I	0.50	G,H					
1170	Swansea Snd,Swansea	I	0.58	A,J					
1170	1170AM,High Wycombe	I	0.25	C,G,K					
1242	Capital G,Maldstone	I	0.32	G,K					
1242	IoW Radio, Wootton	I	0.50	D,H					
1251	C.G.Amber,Bury St'ed	I	0.76	G,K					

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

Listeners:-

- (A) Robert Connolly, Kilkeel.
- (B) John Court, Birmingham.
- (C) John Eaton, Woking.
- (D) Simon Hockenbult, E.Bristol.
- (E) Sheila Hughes, Morden.
- (F) Rhoderick Illman, Dxted.
- (G) Brian Keyte, Gt.Bookham.
- (H) George Millmore, Wootton, IoW.
- (I) Tom Smyth, Co.Fermanagh.
- (J) David Stevenson, Swansea.
- (K) Phil Townsend, E.London.

It, Ger, Fr to Australasia 0830-1030) 34553 at 0847 in Larnaca, Cyprus.

After mid-day R.Sweden via Horby **13.740** (Eng to Asia, Pacific 1330-1400) was 43433 at 1335 in Freshwater Bay, IoW; Vatican R, Italy **13.765** (Eng to Asia 1540?-1610) 55545 at 1600 in NE.Bedford; DW via Nauen **13.610** (Fr to Africa 1700-1800) 54555 at 1715 in Liverpool; Vatican R, Italy **13.765** (Eng to Africa 1730-1800) 44444 at 1734 in Woodhall Spa; R.Ukraine Int, Kiev **13.590** (Ger to Eur 1700-1800) 44334 at 1740 in Colyton; WHRI via Noblesville, USA **13.760** (Eng to E.U.S.A, Eur 1500-2100) 44444 at 2007 in Morpeth; Christian Science SWB via WSHB Cyprus Creek, USA **13.770** (Eng to Eur 2000-2100 Wed & Sun) 33333 at 2012 in Plymouth; R.Havana Cuba **13.715** (Eng to Eur 2030-2130) 32222 at 2030 in Appleby; R.Havana Cuba **13.605** (Eng [u.s.b.] to Eur 2030-2130) SIO343 at 2034 in Woking; R.Austria Int via Moosbrunn **13.730** (Sp to Africa 2030-2100) 44233 at 2040 in Rugby; RCI via Sackville **13.650** (Eng, Fr to Eur, Africa 2000-2200) 44444 at 2101 in Oxted; WINB Red Lion, USA **13.790** (Eng to Eur, Africa 1700-2200) 32222 at 2123 in Stockport; RCI via Sackville **13.670** (Eng to Eur, Africa 2000-2130) 24232 at 2126 in Newry; R.Damascus, Syria **13.610** (Eng to America, Pacific 2105-2205) 44544 at 2147 in Bridgwater; R.Nederlands via Flevo **13.700** (Du to Africa 2130-2225) 44444 at 2157 in Truro; WEWN Birmingham, USA **13.615** (Eng to N.America 2130-

2300) 2322 at 2250 in Kilkeel; Christian Science BC via WSHB Cyprus Creek, USA **13.770** (Eng to S.Eur, W.Africa 2300-0000 Wed & Sun) 43333 at 2300 in Stalbridge.

R.New Zealand has been reaching the UK in the **11MHz (25m)** band. Their broadcast to Pacific areas on **11.905** (Eng 0459-0800) was rated 23312 at 0615 in Newry. Also noted during the morning were the Voice of Greece, Athens **11.645** (Gr, Eng to Eur, Australia 0600-0800), rated SIO3333 at 0650 in Woking; HCJB Quito **11.960** (Eng to Eur 0700-0900) 45554 at 0805 in Wallsend; R.Prague, Czech Rep **11.600** (Sp, Fr, Cz to Eur 0730-0857) 55555 at 0814 in Plymouth; R.Korea Int via Sackville, Canada **11.715** (Eng to S.America 1030-1100) 34334 at 1043 in St.Mary's, IoS.

During the afternoon R.Finland via Pori **11.900** (Eng to W.Eur, USA 1230-1255 Mon-Sat) was 33333 at 1235 in Truro; ERT Tunisia **11.730** (Nat prog 0600-1710) 43333 at 1320 in Stalbridge; R.Japan via Sri Lanka **11.880** (Eng to Asia 1400-

1500) 22322 at 1400 in Dudley; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1000-1630) 33333 at 1430 in W.London; R.Cairo, Egypt **12.050** (Ar [Home Sce relay] to Eur, N.America) SIO222 at 1515 in Macclesfield; R.Australia via Shepparton **11.660** (Eng to Asia 1330-1700) 43444 at 1620 in Freshwater Bay, IoW; BBC via Skelton & Woofferton, UK **12.095** (Eng to Eur, N/W.Africa 0400-2000) SIO444 at 1700 in Co.Fermanagh; WWCR Nashville, USA **12.160** (Eng to N.America, Eur 1400-2200) 44344 at 1715 in Liverpool.

Later, R.Pakistan, Islamabad **11.570** (Ur to Eur 1700-1900) was 44344 at 1825 in Colyton; R.Australia via Shepparton **11.880** (Eng to Pacific areas 1700-2130) 23443 at 1854 in Storrington; China Nat.R, Taiwan **11.100** (Ch) 33343 at 1856 by **Robert Shacklock** in Westwood, Notts; Voice of Vietnam, Hanoi **12.020** (Eng to Eur 1900-1930) 24333 at 1904 in Manchester; Voice of the Mediterranean, Malta via Russia **12.060** (Eng to Eur 1900-2000 [Not Fridays]) 43543 at 1905 in

MEDIUM WAVE CHART

Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener
819	Warsaw	Poland	300	F*	1251	Huisberg	Netherlands	10	E*,I*
819	S.Sebastian(EI)	Spain	5	F*	1250	SER via ?	Spain	?	F*
820	Rotterdam	Holland	20	A*,E*,J	1250	Guldford (V)	UK	0.5	A,J
828	Barcelona(SER)	Spain	50	I*	1269	Neumunster(DLF)	Germany	600	E*,F*
831	Nancy	France	200	H*,I*	1269	COPE via ?	Spain	?	I*
837	COPE via ?	Spain	?	A*,E*,F*,I*	1278	Dublin/Cork(RTE2)	Ireland (S)	10	D,E*,H,I
846	Rome	Italy	540	A*,C*,F*	1287	RFE via ?	Czech Rep.	400	E*,F*
855	Berlin	Germany	100	E*,I	1287	Lerida(SER)	Spain	10	A
855	RNE1 via ?	Spain	?	A*,E*,F*,I*	1296	Valencia(COPE)	Spain	10	A*
864	Santah	Egypt	500	A*,F*	1296	Orfordness(BBC)	UK	500	D,H
864	Paris	France	300	A,F*,J	1305	Rzeszow	Poland	100	E*
864	Socuellamos(RNE1)	Spain	2	F*	1305	RNE5 via ?	Spain	?	I*
873	Zaragoza(SER)	Spain	20	E*,F*,I*	1314	Kvitsov	Norway	1200	A*,E*,F*,G,I*
873	Enniskillen(R.U.I)	UK	1	E*	1323	W'brunn (V.Russia)	Germany	1000/150	E
882	COPE via ?	Spain	?	A*,E*,F*	1332	Rome	Italy	300	A*,E*,F*
882	Washford(BBCWales)	UK	100	A,B,D,F,H,I,J	1341	Lisnagarvey(BBC)	Ireland (N)	100	D,F*,H,I
891	Algiers	Algeria	600/300	A*,B*,E*,F*	1341	Tarrasa(SER)	Spain	2	A*,E*
900	Brno(CRo2)	Czech Rep.	25	A*,E*,F*	1350	Nancy/Nice	France	100	A*
900	Milan	Italy	600	A*,E*	1350	Cesvaine/Kuldiga	Latvia	50	A*,F*
900	COPE via ?	Spain	?	F*,I*	1359	Madrid(RNE)	Spain	600	E*,F*
909	B'mans Pk(BBC5)	UK	140	A,F,H,I	1368	Foxdale(Manx R)	IoM	20	D*,E*,G,H,I
918	Domzale	Slovenia	600/100	A*,F*	1377	Lille	France	300	A,F,I,J
918	Madrid(R.Int)	Spain	20	A*,F*,I*	1386	Bolshakovo	Russia	2500	E*,F*
927	Volvertem	Belgium	300	A*,E*,F,I,J	1395	TWR via Filake	Albania	500	E*,F*
936	Bremen	Germany	100	E*,F*	1395	Lopic	Netherlands	120/40	E*,F*,J
936	L'ov	Ukraine	500	I*	1404	Brest	France	20	E*,F*
954	Brno (CRo2)	Czech Rep.	200	F*	1413	RNE5 via ?	Spain	?	E*,F*,I*
954	Madrid(CI)	Spain	20	F*	1422	Heusweiler(DLF)	Germany	1200/600	A*,E*,F*
963	Pori	Finland	600	E*,F*,I*	1431	Kopani	Ukraine	500	E*
963	Tir Chonail	Ireland (S)	10	H*,I*	1440	Marnach(RTL)	Luxembourg	1200	E*,E*,H,I,J
972	Hamburg(NDR)	Germany	300	E*,F*,I*	1440	Damman	Saudi Arabia	1600	B*,C*
981	Alger	Algeria	600/300	B*,E*	1449	Squinzano (RAI)	Italy	50	A*
990	Berlin	Germany	300	B*,F*	1449	Monchegorsk	Russia	42	I*
990	R.Bilbao(SER)	Spain	10	F*	1449	Redmoss(BBC)	UK	2	E*
990	Redmoss(BBC)	UK	1	E*	1467	Monte Carlo(TWR)	Monaco	1000/400	A*,C*,E*,F*,J*
990	Twynn(BBC)	UK	1	D,I*	1476	Wien-Bismar	Austria	600	I*
999	Schwerin (RIAS)	Germany	20	E*	1485	SER via ?	Spain	?	I*
999	Madrid(COPE)	Spain	50	I*	1494	Clermont-Ferrand	France	20	A*
1008	Flevo(Hilv-5)	Holland	400	A*,E*,F,I,J	1494	St.Petersburg	Russia	1000	F*
1017	Rheinsender(SWF)	Germany	600	E*,F*	1503	Stargard	Poland	300	A*
1017	RNE5 via ?	Spain	?	I*	1503	Jarragon(SER5)	Spain	5	I*
1026	SER via ?	Spain	?	I*	1512	Wolvertem	Belgium	300	A*,B*,E*,F*,I
1035	Lisbon(Prog3)	Portugal	120	E*	1521	Kosice(Cizatice)	Slovakia	600	F*
1044	Dresden(MDR)	Germany	20	F*	1521	Duba	Saudi Arabia	2000	A*,F*
1044	Sebbae-Aioun	Morocco	300	F*	1530	Vatican R	Italy	150/450	A*,E*,F*
1044	S.Sebastian(SER)	Spain	10	F*	1539	Mainflingen(ERF)	Germany	350/700	E*,F*
1053	Zaragoza(COPE)	Spain	10	E*	1539	SER via ?	Spain	?	A*,C*
1053	Talk R.UK via ?	UK	?	A,F,H,I,J	1557	Nice	France	300	H,I
1062	Kalundborg	Denmark	250	E*,F*	1566	Samen	Switzerland	300	F*
1062	R.Uno via ?	Italy	?	F*	1575	Genova	Italy	50	A*
1071	R.France via ?	France	?	F*	1575	SER via ?	Spain	5	C*,F*,I*
1071	Brest	France	20	F*	1584	SER via ?	Spain	2	A*,I*
1071	Bilbao(EI)	Spain	5	F*	1593	Holzkirchen(VOA)	Germany	150	E*,F*
1071	Talk Radio UK via ?	UK	?	A*	1602	SER via ?	Spain	?	A*,F*,I*
1080	Katowice	Poland	1500	E*	1602	Vitoria(EI)	Spain	10	F*,I*
1080	SER via ?	Spain	?	E*,F*,I*	1602	R.Beograd	Yugoslavia	1	I*
1089	Talk Radio UK via ?	UK	?	A,F,I	1611	Vatican R	Italy	15	I*
1098	Nitra(Larok)	Slovakia	1500	E*,F*					
1107	AFN via ?	Germany	10	E*,I*					
1107	Talk R.UK via ?	UK	?	A,F,I					
1116	Bari	Italy	150	I*					
1125	La Louviere	Belgium	20	F*					
1125	RNE5 via ?	Spain	?	E*					
1125	Llandrindod Wells	UK	1	D,I					
1134	Muransk & Saransk	Russia	75 & 30	I*					
1134	COPE via ?	Spain	?	F*					
1134	Zadar(Croatian R)	Yugoslavia	600/1200	E*,F*					
1143	AFN via ?	Germany	1	A*					
1143	Stuttgart(AMN)	Germany	10	E*					
1143	COPE via ?	Spain	2	A*,F*,I*					
1152	RNE5 via ?	Spain	10	I*					
1161	Ain-Salah	Algeria	5	F*					
1179	Solvesborg	Sweden	600	A,E*,F*					
1188	Kuurne	Belgium	5	A,E*,J					
1188	Szolnok	Hungary	135	F*					
1197	Munich(VOA)	Germany	300	E*					
1197	Virgin via ?	UK	?	A,F,H,I,J					
1215	Virgin via ?	UK	?	A,F,H,I					
1224	Lelystad	Holland	50	A,E*					
1224	COPE via ?	Spain	?	I*					
1233	Liege	Belgium	5	E*					
1233	Virgin via ?	UK	?	I*					
1242	Marseille	France	150	I*					
1251	Marcali	Hungary	500	F*					

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

Listeners:-

- (A) John Eaton, Woking.
- (B) Sheila Hughes, Morden.
- (C) Rhoderick Illman, Oxted.
- (D) Brian Keyte, Gt.Bootham.
- (E) Eddie McKeown, Newry.
- (F) George Millmore, Wootton IoW.
- (G) Clare Pinder, while in Appleby.
- (H) Tom Smyth, Co.Fermanagh.
- (I) David Stevenson, Swansea.
- (J) Phil Townsend, E.London.
- (K) Thomas Williams, Truro.
- (L) Tom Winzor, Plymouth.

TROPICAL BANDS CHART

Freq (MHz)	Station	Country	UTC	DXer	Freq (MHz)	Station	Country	UTC	DXer
3.255	BBC via Meyerton	S.Africa	2022	B,I,J,K,N,O,P	5.025	R.Rebelle, Habana	Cuba	1938	F
3.270	SWABC 1, Namibia	S.W.Africa	2021	B,K,N,O	5.025	R.Uganda, Kampala	Uganda	1943	F,J,K
3.290	Nambian BC, Windhoek	S.W.Africa	2021	B,K,N,O	5.030	AWR Latin America	Costa Rica	0200	A,B
3.306	ZBC Prog 2	Zimbabwe	1947	B,K,N	5.030	RTM Kuching	Sarawak	2308	C
3.316	SBS Goderich	Sierra Leone	2021	B,K,O	5.035	R.Bangui	C.Africa	2034	J,K,O
3.320	SABC (RSG) Meyerton	S.Africa	1927	B,K,O	5.047	R.Togo, Lome	Togo	1946	B,G,I,J,K,O
3.335	CBS Taipei	Taiwan	2019	C,K	5.050	R.Tanzania	Tanzania	1945	E,H,K
3.365	R.Cult. Araraquara	Brazil	2329	C	5.055	RFO Cayenne(Matoury)	French Guiana	0005	B
3.365	GBC R-2	Ghana	2121	B,C,G,K,N,O	5.075	Caracol Bogota	Colombia	0005	B,O
3.380	NBC Blantyre	Malawi	1844	B,K	5.100	R.Liberia, Totota	Liberia	2145	H,I,M
3.915	BBC via Kranji	Singapore	2124	B,C,I,J,M,N,O,P,Q					
3.955	BBC via Skelton	England	0400	A,J,R					
3.955	Nexus, Milan	Italy	2130	M					
3.970	R.Korea via Skelton	England	2100	A,J,J,L,P					
3.975	R.Budapest	Hungary	1900	F,I,J,L					
3.980	Nexus, Milan	Italy	1903	J					
3.985	Nexus, Milan	Italy	2117	I,M,N					
3.985	China R.Int via SRI	Switzerland	2100	A,B,J,L,P,Q					
3.995	DW via Julich	Germany	2116	B,C,I,J					
3.995	DW via Meyerton	S.Africa	2133	P					
4.005	Vatican R.	Italy	2140	B,I,J,M,N					
4.735	Xinjiang, Urumqi	China	2258	C					
4.755	R.Educ CP Grande	Brazil	0335	J					
4.765	R.Rural, Santarem	Brazil	0015	B					
4.770	FRCN Kaduna	Nigeria	2100	B,C,E,F,G,I,J,K,N,O,P					
4.777	R.Gabon, Libreville	Gabon	2046	G					
4.783	RTM Bamako	Mali	2100	B,C,F,G,H,I,J,K,M,N,O,P					
4.785	Caiari Porto Velho	Brazil	2303	C					
4.800	LNBS Maseru	Lesotho	2135	B,F,J					
4.815	R.diff.TV Burkina	Ouagadougou	2029	B,C,J,K,N,O,P					
4.820	R.Botswana, Gaborone	Botswana	2040	F,H,I,J,O					
4.822	R.Mauritania	Mauritania	2130	O					
4.825	R.Educadora,Braganca	Brazil	2202	C					
4.828	ZBC R-4	Zimbabwe	2000	B,K					
4.830	R.Tachira	Venezuela	0339	B,J					
4.835	RTM Bamako	Mali	2125	B,C,J,K,O					
4.845	ORTM Nouakchott	Mauritania	2140	B,K					
4.850	R.Younde	Cameroon	2229	B,C,I,J,K,O					
4.860	AIR Delhi	India	1858	C					
4.865	R.Alvorada, Londrina	Brazil	2215	C					
4.865	PBS Lanzhou	China	2205	H					
4.870	R.Cotonou	Benin	2244	B,C,G,K,O,P					
4.885	R.Clube do Para	Brazil	2220	O					
4.885	R.Difusora Acreana	Brazil	2355	B					
4.890	RFI Paris	via Gabon	0357	J					
4.890	R.Port Moresby	New Guinea	1943	K					
4.905	R.Nat.N'djamena	Chad	2057	J					
4.910	R.Zambia, Lusaka	Zambia	2155	B					
4.915	R.Anhanguera	Brazil	0040	B,O					
4.915	GBC-1, Accra	Ghana	2000	A,B,F,H,I,J,K,O,P					
4.915	KBC Cent Sce Nairobi	Kenya	1950	K					
4.915	R.Cora de Peru, Lima	Peru	0400	A,F					
4.920	R.Quito, Quito	Ecuador	0410	A,D					
4.927	RRI Jambi	Indonesia	2224	C,O					
4.935	KBC Gen Sce Nairobi	Kenya	2055	F,O					
4.950	VOA via Sao Tome	Sao Tome	1930	E,F,G,H,I,K,L,O,P					
4.955	R.Nac. de Colombia	Colombia	0415	B,D					
4.960	VOA via Sao Tome	Sao Tome	0320	J					
4.965	Christian Voice	Zambia	1945	B,K					
4.975	R.Uganda, Kampala	Uganda	1940	E,F,H,I,J,K,P,Q					
4.980	Ecos del Torbes	Venezuela	0015	B,C,H,J					
4.985	R.Brazil Central	Brazil	0010	A,B,O					
4.990	R.Animas, Chocaya	Bolivia	0437	A					
5.009	R.TV Malagasy	Madagascar	1841	K					
5.010	R.Garoua	Cameroon	1917	K					
5.020	La V du Sahel, Niamey	Niger	2139	B,I,J,K,O					
5.025	R.Parakou	Benin	2151	B,I,K					

DXers:-

- (A) Michael Casey, Manchester.
- (B) Robert Connolly, Killeel.
- (C) John Eaton, Woking.
- (D) David Edwardson, Wallsend.
- (E) Bill Griffith, SW London.
- (F) David Hall, Morpeth.
- (G) Simon Hockenhill, E.Bristol.
- (H) Sheila Hughes, Morden.
- (I) Rhoderick Illman, Oxted.
- (J) Eddie McKeown, Newry.
- (K) Fred Pallant, Storrington.
- (L) Clare Pinder, while in Appleby.
- (M) Peter Pollard, Rugby.
- (N) Vic Prier, Colyton.
- (O) Richard Reynolds, Guildford.
- (P) Robert Shacklock, Westwood.
- (Q) Tom Smyth, Co.Fermanagh.
- (R) Ernest Wiles, NE.Bedford.

Bridgwater; Voice of Hope via Georgia **12.125** (Eng to Eur 1900-2000) 34333 at 1915 in Morden; China R.Int via ? **11.840** (Eng to Eur 1900-1955) 43444 at 1919 in Woodhall Spa; REE via Noblejas? **11.830** (Eng to Eur, Africa 2000-2055) 33433 at 2000 by **Ross Lockley** in Galashiels; BBC via Ascension Is **11.835** (Eng to W.Africa 1930-2300) 44444 at 2018 in Morpeth; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 33333 at 2050 in Stockport; RCI via Sackville **11.690** (Eng to Eur, Africa 2000-2130) 42342 at 2102 in Oxted; R.Budapest, Hungary **11.700** (Eng to Eur 2100-2130) 44333 at 2100 in Appleby; R.Bulgaria, Sofia **11.720** (Eng to Eur 2100-2200) 54444 at 2150 in Norwich; BBC via Ascension Is **12.095** (Eng to S.America 2000-0200) 55455 at 2200 in Kirkby Stephen; R.Bulgaria, Sofia **11.720** (Eng to N.America 2300-0000) SIO444 at 2346 in N.Bristol.

Some of the broadcasts in the **9MHz (31m)** band are intended for European listeners. Those noted came from Christian Science BC via WSHB Cypress Creek, USA **9.835** (Eng 0800-1000) rated SIO433 at 0922 in Macclesfield; R.Nederlands via Wertachtal, Germany **9.860** (Eng 1030-1225) 55555 at 1040 in Herstmonceux; R.Vlaanderen Int, Belgium **9.925** (Eng 1030-1055, also to M.East) 55555 at 1045 in Norwich; RFI via Allouis? **9.805** (Fr, Eng 0600-1400, also to M.East, N.Africa) 55444 at 1245 in Kirkby Stephen; R.Norway Int, Oslo **9.590** (Norw [Eng Sun] 1300-1330) 33333 at 1300 in Truro; Israel R, Jerusalem **9.435** (Eng 1545-1600, also to USA) 44444 at 1545 in NE.Bedford; R.Bulgaria, Sofia **9.700** (Eng 1900-2000) 44444 at 1915 in Woodhall Spa; RAI Rome **9.670** (Eng 1935-1955) 42432 at 1935 in Galashiels; Voice of Turkey, Ankara **9.460** (Tur 0800-2200, also to USA) 55534 at 1954 in E.Bristol; China R.Int, Beijing **9.920** (Eng 2000-2157) 43334 at 2000 in Dudley; Voice of Russia **9.710** (Eng [WS]) 55555 at 2010 in Bridgnorth; R.Thailand, Udon Thani **9.680** (Eng 2030-2100?) 32433 at 2035 in Rugby; R.Bulgaria, Sofia **9.700** (Eng 2100-2200) 44444 at 2108 in Stockport.

Whilst beaming to other areas ORTM Bamako, Mali **9.635** (Fr, Ar? to W.Africa 0758-1757) was 24542 at 0820 in Wallsend; HCJB Quito, Ecuador **9.640** (Eng to S.Pacific 0700-1100) 32233 at 0824 in Morpeth; R.Yugoslavia **9.720** (Eng to E.Africa 1830-1900) 34253 at 1850 in Manchester; DW via Sines **9.640** (Eng to W.Africa 1900-1950) SIO444 at 1900 in Co.Fermanagh; R.Australia via Shepparton **9.500** (Eng to Asia, Pacific 1430-2200) 43433 at 2159 in Oxted; RCI via Sackville **9.755** (Eng [CBC prog] to USA, Caribbean 2200-0300) 33333 at 2200 in Morden.

Many of the broadcasts in the **7MHz (41m)** band are also to Europe. Some come from VOA via Woofferton, UK **7.170** (Eng 0400-0700, also to N.Africa) rated SIO222 at 0600 in

Co.Fermanagh; R.Japan via Woofferton, UK **7.230** (Jap, Eng 0500-0700) 44444 at 0613 in Newry; WYFR via Okeechobee **7.355** (Eng 0600-0800, also to Africa) 33333 at 0640 in Stalbridge; Christian Science BC via WSHB **7.535** (Various 0400-0958) 44444 at 0652 in Plymouth; Sudwestfunk via Rohrdorf 7.265 (Ger 24hrs) 44444 at 0744 in Oxted; AWR via Forli, Italy **7.230** (Eng 0900-1000) 35433 at 0951 in Bridgwater; R.Prague, Czech Rep **7.345** (Eng 1030-1057) 23322 at 1030 in Dudley; AWR via Forli, Italy **7.230** (Eng 1200-1300) 33333 at 1245 in W.London; R.Norway Int, Oslo **7.485** (Norw [Eng Sun] 1800-1830) 55555 at 1830 in St.Mary's, IoS; Voice of Greece, Athens **7.515** (Eng 1900-1910) 44333 at 1900 in Morden; R.Thailand via Udon Thani **7.210** (Eng 1900-1958) 53422 at 1900 in Galashiels; RAI Rome **7.145** (Eng 1935-1955) 33433 at 1940 in E.Bristol; Vatican R, Italy **7.250** (Eng 1950-2010) 44444 at 1950 in Bridgnorth; Polish R, Warsaw **7.285** (Eng 1930-2025) 53433 at 1950 in Herstmonceux; VOIRI Tehran **7.260** (Eng 1930-2028) 45444 at 1953 in Woking; R.Minsk, Belarus **7.210** (Various [Eng Tues 1930 & 2030, Thurs 2030] 1900-2100, 0400-0600) 53554 at 2030 in Manchester; RCI via Skelton, UK **7.235** (Eng 2000-2130, also to Africa) 43333 at 2030 in Appleby; BBC via Skelton **7.325** (Eng 2000-2230) 55444 at 2037 in Kirkby Stephen.

Logged in the **6MHz (49m)** band during the early morning were WEWN Birmingham, USA **5.825** (Eng to USA, Eur 0000-1000), rated 22222 at 0600 in NE.Bedford; R.Japan via Skelton, UK **5.975** (Eng to Eur 0600-0700) 54454 at 0612 in Newry; WWCR Nashville, USA **5.935** (Eng to USA 0100-1400) 22232 at 0730 in Colyton; SRI via Lenk? **6.165** (Eng, Fr, Ger, It to Eur 0400-1930) 54444 at 1017 in Norwich.

Later, Suddeutscher Rundfunk, Muhlacker **6.030** (Ger to Eur) was 54554 at 1700 in W.London; Polish R, Warsaw **6.095** (Eng to Eur 1700-1800) 43333 at 1730 in Morden; R.Yugoslavia **6.100** (Eng to E.Africa 1830-1900) 42343 at 1830 in Manchester; Polish R, Warsaw **6.095** (Eng to Eur 1930-2030) 44544 at 1944 in E.Bristol; RCI via Skelton, UK **5.995** (Fr, Eng to Eur, M.East, N.Africa 1900-2100) 44444 at 2000 in Woodhall Spa; R.Finland via Pori **6.135** (Eng to Eur 2000-2030) 55555 at 2000 in Bridgnorth; BBC via Cyprus **6.180** (Eng to Eur 1700-2200) 55555 at 2045 in Liverpool; R.Austria Int via Moosbrunn **6.155** (Eng to Eur 2130-2200) 44444 at 2130 in Appleby; R.Ukraine Int **6.020** (Eng to Eur 2100-2200) 44344 at 2200 in Rugby; R.Cultura, Sao Paulo, Brazil **6.170** (Port 0800-0400) 24433 at 2212 in Guildford; R.Nederlands via Flevo **6.020** (Eng to N.America 2330-0125) rated SIO444 at 0036 in N.Bristol; WHRI South Bend, USA **5.745** (Eng to E.USA, Eur 2200-0400) 54455 at 0300 in Morpeth.

A Delightful Year

SCANNING



Peter Bond, our MilAir man, reports in with his personal findings, resulting from his 'Long Term Test' of his very own IC-R8500. After a year's use, here are his findings.

Ever since John Wilson's comprehensive report on the Icom IC-R8500 appeared in *SWM* in September 1996, I have been in the fortunate position to have had, 'Hands on' experience with this extraordinary radio. John's review covered primarily the facilities and specifications and reference to the review should be made for more detailed information on these aspects. This long-term look is a supplementary review seen more from the user's viewpoint.

Over the past few years several manufacturers have produced radios which have covered both the h.f. and v.h.f./u.h.f. spectrums. (I exclude from these comments the Icom IC-R9000 as it is quite simply beyond the means of most of us mere mortals!). Receivers such as the AOR AR3000A have been very competent v.h.f./u.h.f. scanners with the addition of modest performance on h.f., but could never be described as dedicated h.f. radios. I owned an Icom IC-R7100 which again was an excellent performer on v.h.f. and u.h.f. but had an h.f. conversion which could only be regarded as adequate - not an Icom conversion I might add. Consequently, the field was open for someone to produce a wide-band radio that gave well above average performance on both the h.f. and v.h.f./u.h.f. bands - Enter the IC-R8500.

Memory Mania

To kick-off, I would like to make some comments regarding the memory facilities of the R8500, and dare I say it, I am also compelled to make one memory related complaint. The initial thing that I was pleased to see was that Icom have followed the path of using more banks with less channels. Some of the other receiver manufacturers continue to use fixed banks of 100 channels, and for the large percentage of users I have discussed this subject with, this is far too many - 30, 40 or even 50 channels is a much more manageable size - However, Icom have come up with the perfect solution to bank sizes.

The new 'cut and paste' aspect of the memory channels, is a unique feature that I am surprised no one has thought of before. Instead of having 800 channels

which are fixed into 20 banks of 40 channels, the R8500 gives you the flexibility to expand or contract the banks to suit your own needs. For example, if you listen to the military airbands and wished to store all the London Military frequencies in one bank, (currently about 62 frequencies), you can easily expand a bank from 40 to 65 memories. This is achieved by first deleting selected memories from other banks to the **free** bank, (used for storing spare memories), and then allocating them to the bank of your choice. This all adds to great flexibility, the only restrictions are that each bank must retain at least one memory, and the total number of memories available to the 20 primary banks is 800. If you so wish you can expand the 800 memories by using some of the 200 available to the SKIP and AUTO banks, although you would be wise not to reduce these banks too far as you would degrade their ability to work efficiently when running searches or operating in auto - memory write mode.

Now for the moan - The R8500 can only scan one bank at a time, or all the banks together, there is no facility to link and scan selected banks. Considering, even some of the most modest hand-held radios have this facility, it seems a rather glaring omission for a radio of this sophistication. Unfortunately, Icom have compounded this matter by removing one of the facilities included with the previous model, the IC-R7100. This allowed 10 user definable groups of memories to be selected throughout any of the banks by the allocation of a unique number between 0 and 9 to selected memories. Just one user defined scan is available on the R8500, which I personally feel is a step backwards. This is achieved by deselecting the 'BANK' command, and then adding the 'SELECT - CHANNEL' command to the memories of your choice, Having said that, I think that my complaint is





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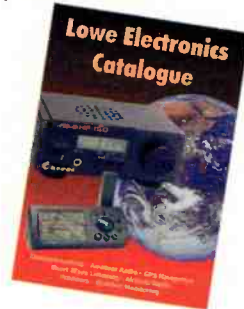
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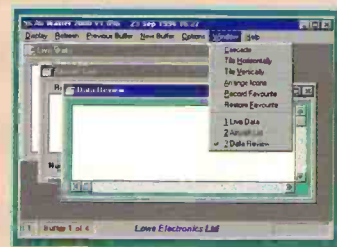
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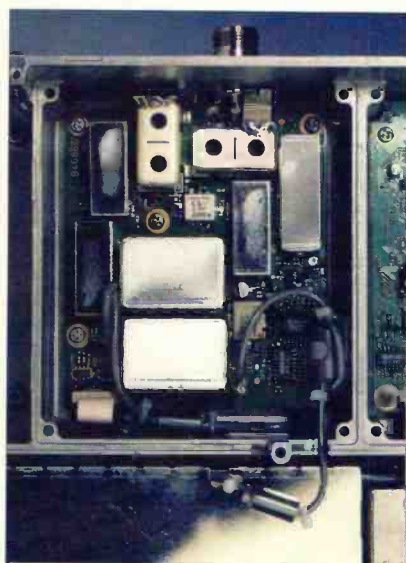
A Delightful Year

Peter Bond reports on using the IC-R8500



Competition

Some of you reading this article may have wondered why I have not made the most obvious comparison and that is with AOR's AR5000 - The answer is, I did. However, I did not want my comments to become a direct head to head between the two receivers. All I will say is this. For four complete days I ran both sets side by side on the same antennas an all bands and formed my own opinions. As I type the final words of this long term test, I am still sitting here with my '8500 ticking away in front of me. Whilst the AR5000 is an excellent radio, I for one have no intention of replacing my R8500 with one - personal choice!



tempered slightly by the addition of the excellent 'cut and paste' facility.

Antennas

Now on to R8500 in everyday use. To ensure that this review was representative of the facilities used by many readers, the following antenna set-up was used. For h.f. listening, two antennas were used. (1) A simple 20m multi-strand copper, longwire was connected directly to the 500Ω socket using a phono plug. (2) A 30m multi-strand copper longwire was connected via a balun (UNUN) and a 50Ω coaxial feeder cable to the 50Ω socket. The longwires were about 8m above the ground, an r.f. earth was connected and an antenna tuner was used intermittently.

For v.h.f./u.h.f. listening, a roof mounted, stainless steel, wide-band discone was used with a good quality low loss cable with N-type connectors to the radio. Plus, a dedicated stainless steel v.h.f./u.h.f. airband antenna was also used, but to be honest the extra gain achieved by this antenna does not make that much improvement over a good discone. Although my comments cover reception on many bands, I make no apology for using the various airbands for some of my main comments and comparisons. This is simply because it is the subject I know best, and am consequently therefore better qualified to comment.

Hands On - VHF & UHF

My home in the South of England is located on the side of a Northwest facing hill about 67m above sea-level. This raised location admittedly does help with v.h.f./u.h.f. reception, but you still need a good radio to get the results. Quite simply the v.h.f./u.h.f. performance of the R8500 is outstanding.

On the airbands the '8500 'pulls in' signals that others radios on the same antenna will not even break the squelch, it is one of the few radios that could out-perform the venerable Signal R-535. I can clearly hear aircraft in Upper airspace, working London Military East frequencies with no problem. Aircraft descending into Mildenhall can be heard down to around 15000 feet, the ground controller at Yeovilton Radar can be heard over 112km away and on occasion when the conditions are right I can hear the weather on the ATIS at Lyneham, well over a 160km away! As I type this, I have just heard 'Archer formation' leave London Military North on 254.275, they then called Shawbury Approach on 362.475 at Flight Level 210 descending to 5000 feet. Shawbury must be at least 380km in a straight line - need I say anymore.

On v.h.f., aircraft at even greater distances can be heard. Aircraft in the North of England working the Wirral Sector can be clearly heard, as can aircraft working Shannon Control and occasionally the southern sectors of Scottish Control.

On other bands the reception is equally as good. I have heard two-way transmissions, base to p.m.r. from traffic

police attending an accident on the M5 by Junction 3 just south of Bristol. Once again this is at least 112km away. Radio amateurs using hand-held radios have been heard at substantial distances considering their low output power. On the Marine Bands, ships well over the horizon have been heard and stations on the north coast of France such as 'Cherbourg Radio', are often heard. (Good old marine ducting - Ed.)

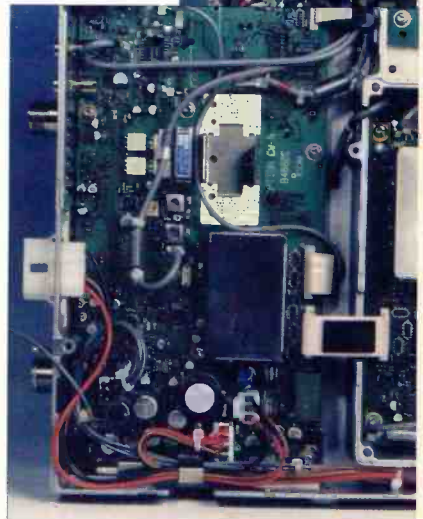
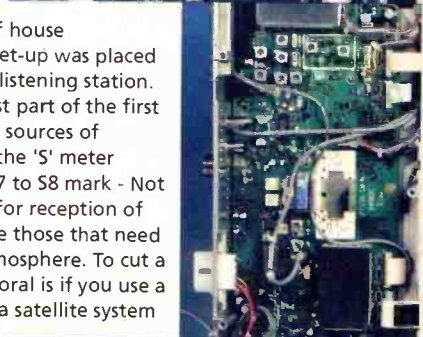
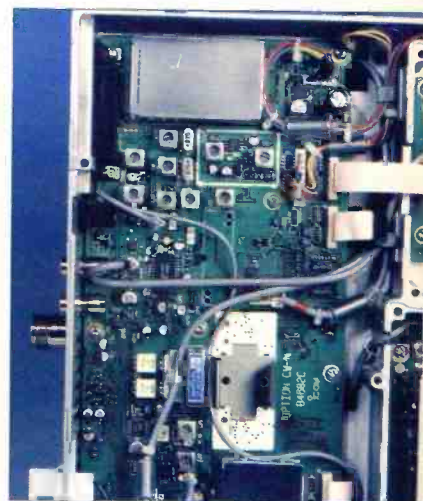
I could go on, but by now you will have gathered that I am more than impressed with the v.h.f./u.h.f. performance of the '8500.

Hands On - HF

Whilst the R8500 is in a different league and price-bracket to some of the other sets that have had coverage of both h.f. and v.h.f./u.h.f., I was still dubious as to whether it could perform on short wave bands as well as a dedicated h.f. set. I set-up the R8500 alongside my NRD-525 with a splitter and combiner system, so that both antennas were available to either receiver.

As a consequence of house decorating, the radio set-up was placed away from my normal listening station. After the move the best part of the first hour was spent tracing sources of interference that sent the 'S' meter hovering around the S7 to S8 mark - Not the best arrangement for reception of strong signals, let alone those that need to be coaxed from the atmosphere. To cut a short story long, the moral is if you use a D2-MAC decoder with a satellite system or alternatively an amplifier to boost a signal to a remote TV, keep them well away from h.f. receivers and their antennas - So endeth the lesson. (Yes I know it all seems obvious now!). Anyway - back to the plot.

Over the weeks, I have roamed around the h.f. bands and have become more and more impressed with the R8500. My main interest is the utility stations especially those that



are aviation related. During the past 18 months, I noted numerous stations the most interesting being calls to distant US Global stations such as Hickham (Hawaii), and Yokota (Japan). Aircraft working the major world air routes were heard working some of the more distant areas such as Southeast Asia (SEA-1 and 2), and South Pacific (SP), with calls to Honolulu and Auckland being noted during periods of high atmospheric pressure.

Reception on the Broadcast bands was excellent and many distant stations were received, not least of which was a rather eccentric religious evangelist in Tennessee! Radio amateurs were heard from a wide range of countries, the list of which would have been greatly increased if I could understand a few more languages.

Linked up to an ageing PK-232, the R8500 produced a good stable signal to enable decoding of FAXes, Morse, SITOR and other modes.

I cannot say whether the '8500 can compete on h.f. with the latest d.s.p. sets such as the NRD-545, as I have not yet had the chance to make a comparison. What I do know, is that it more than

equalled the performance of my NRD-525, so much so that after running the two side by side for seven months, I reluctantly sold my long serving NRD-525. I was so impressed with the h.f. performance of the R8500.

HF Mobile

To side-track slightly, and to expand on my comments regarding electrical interference above. If you ever want to really see how much spurious electrical emissions come from the average home, try going mobile as I do occasionally and place your radio in an almost sterile environment - r.f. wise. Several years ago I bought a small 12V, 8AH battery from an electrical wholesale outlet, they are quite easy to find and cost about £15 - 18. With a suitable power lead made up with spade connectors and a 10m longwire antenna you have a very simple h.f. mobile system. The battery can be recharged by a household car battery charger and fully charged it will give you between four and five hours

The Bottom Line

During the past 15 months, my R8500 has been evaluated alongside the following receivers: AR2002, AR3000, AR3000A Plus, Signal R-535, Icom IC-R7100, NRD-525 and a Kenwood R-5000. I realise that direct comparisons between radios are not ideal due to a variety of reasons. Not least of which is price differential and consequently, the target market at which they are aimed. The R8500 comes in at the top of the price range, before you head off into the 'lottery winners' class of professional receivers. It therefore, would logically be expected to out-perform cheaper radios. Having said that, in my experience price has not always been the performance indicator. In this instance it most certainly is.

The past decade has seen many new wide-band radios enter the market place. I have been in the fortunate position to have had the opportunity to have had 'hands-on' with a fair proportion of them. With each new arrival, new facilities, and in some cases new gimmicks, have been included in the specifications. It the end it doesn't matter how many knobs and buttons a radio has, to my mind the most important thing is the performance. What use is the ability to change numerous parameters on a radio if the sensitivity, selectivity and strong signal handling characteristics are not up to scratch.

As technology advanced, with each new radio I had the chance to operate, I expected find an increase in performance to complement all the new facilities. To be honest, in most cases little changed. Occasionally I was surprised and on more than a few occasions I was badly disappointed! With the IC-R8500, it was the first occasion for some time where I was actually stunned at its performance. On v.h.f. and u.h.f. the performance was noticeably better than its predecessor the IC-R7100, but it was on h.f. that it really performed above expectations. In my opinion, the IC-R8500 became the first radio available to the UK market, (below £2000), which could deliver the goods on h.f., v.h.f. and u.h.f. At around £1500 new, it is not cheap but taken into context it does effectively replace two receivers. If you want the best of all worlds then this will be the radio for you.

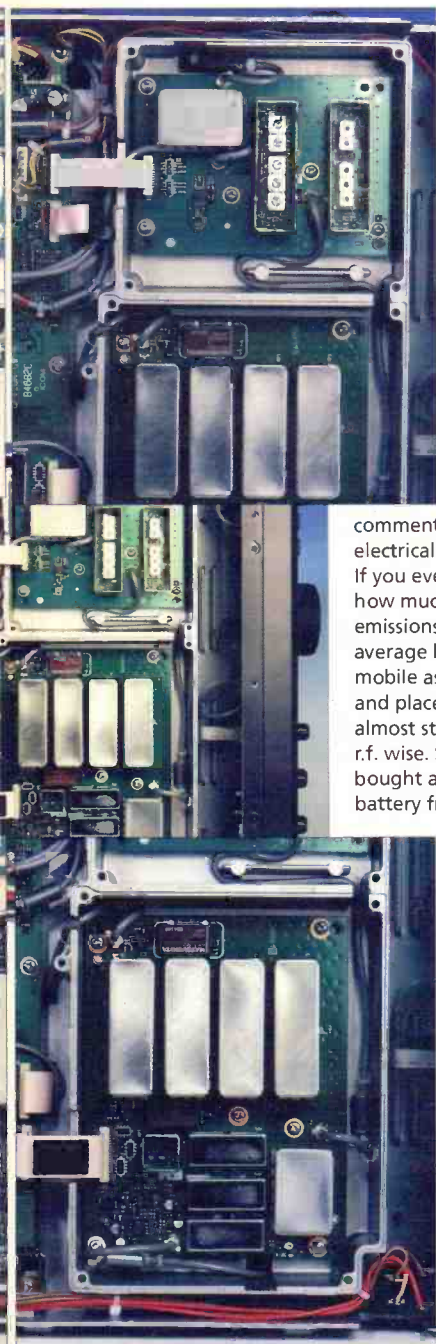
listening with the R8500's current drain of around 2A. One point of note, don't power the R8500 from your car except for short periods, it can flatten an average car battery quite quickly, especially if it is not in a fully charged state! A radio such as the AR3000A with a lower current drain will run for about 10 hours on this battery. A variety of higher capacity batteries are available but they become rather unwieldy for mobile use.

I live near the sea and consequently in the summer I regularly take my mobile R8500 set-up to the local cliff tops for a picnic and a serious search around the h.f. bands. The spot I choose is about 500 yards walk from the car park, it is about 76m above the sea with spectacular views and is at least a mile from any form of electrical emission. The results with the R8500 are spectacular, (as they would be with any other h.f. radio in this noise-free situation). With the 12V d.c. power source and all background noise removed the R8500 could clearly pick-up faint signals that were almost inaudible at home. This remote location really shows up the amazing h.f. performance of the '8500. I realise that it can be a bit cumbersome to carry a radio this size, a battery and leads, etc, to a remote location, but if you get the chance try it, you will not be disappointed with the results!

Problems!

I have to admit that my time with the '8500 has not been problem free. After about four months in use an intermittent problem arose which progressively became worse. After power-up, the whole of the digital display would flash for a few seconds before allowing normal control. During this period none of the controls would work. After about a week the whole system locked up and the display flashed continuously. The set went back to Icom who repaired it quickly and I had it back in eight days.

Unfortunately, the problem re-occurred after about eight weeks and the receiver, once again, went back to Icom. The problem was diagnosed as a faulty capacitor array which was replaced and since then the set has performed perfectly. One thing I did notice was that when the set was returned the second time there appeared to be a very slight but noticeable increase in the sensitivity. Whether it had been tweaked by Icom or it was just my imagination, I am not quite sure, but one thing's for certain, I am not complaining!



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Decoding Systems

Over the years a vast array of decoding systems have been produced and in this section I'll attempt to give you enough information to guide you through the maze. To help with this I have divided these decoding systems into three broad areas - Computer based, Data Controllers and Stand Alone Systems.

Computer Based Decoding: If you already have a computer at your disposal, particularly a PC compatible, then a computer based decoding system is likely to be the cheapest option for you. This is because the processing power of your computer can be harnessed to do most of the hard work. However, you do need to be aware of the limitations of computer based systems as many of the older models can only be used to decode simple RTTY and c.w. signals. By far the best supported computer is the IBM PC and compatibles, but even with the PC you need to be sure you have a processor fast enough to handle your requirements. The most demanding application for a PC is the direct decoding and display of FAX images using a program like *JVFAX 7.0*. When receiving this mode the processor not only has to process the incoming audio signal, but also has to decode the data and update the screen. All this demands a lot of processor time and you may find that computers with a 80286 or earlier processor struggle to keep up. The problem can be overcome by using an external interface between the receiver and the computer, but this will typically cost £100 plus and doesn't offer a complete solution. The market leaders in this area are *JVFAX 7.1* for FAX and amateur Slow Scan TV. *Hamcomm 3.0* for RTTY, c.w. and ARQ systems. The newest program is Francois Guillot's *RadioRaft* which offers an extremely wide range of receive modes in a very well priced package. If you look around the second-hand ads you may well find software from many other suppliers such as ICS Electronics and Lowe Electronics.

At the very top end of the computer based decoding systems are the hardware cards that can be fitted to your PC. The market leaders in this area appear to be Wavecom with the excellently specified W41PC DSP Data Decoder Card. For other computer systems check out the adverts in this issue.

Data Controllers: These devices have been developed primarily for the amateur radio market, but can be used very successfully by short wave listeners. In most cases these systems take the audio signal from your receiver, process it and present the decoded output as a serial data signal. All the hard work is done by a dedicated processor built-in to the Data Controller. As a result all the computer has to do is display the decoded output. This very modest requirement means that the Data Controller can be connected to virtually any computer system or a even a dumb terminal.

In addition to carrying the decoded output, the serial connection is also used to carry keyboard commands to configure the Data Controller. One advantage of the Data Controller over a simple PC based system is the inclusion of well controlled audio filtering that can provide much improved performance when operating under poor conditions. Perhaps the most famous data controller is the AEA PK-232 and its derivatives, but this is balanced by very capable products from MFJ and Kantronics.

Stand Alone Decoders: These systems are usually the

preferred choice for newcomers with no computing experience. This is because they offer by far the simplest solution to decoding h.f. data signals. The disadvantage being cost as these systems require their own built-in micro-processor and display systems. In addition to being simple to use, stand alone units generally offer much lower interference levels than computer based systems. For many this is a major advantage in itself and is particularly important if you are unable to erect an effective antenna. Popular examples are the Momentum MCL1100 for simple modes or the Wavecom 4010 and Universal range for the more complex modes.

Receivers

For utility listening a receiver needs to have some features that are perhaps not required for many other aspects of the hobby. The first requirement is that of a single sideband (s.s.b.) receive mode. In most cases this will be selectable between upper and lower side band. If you are considering one of the older receivers such as an RA-17 you will find that s.s.b. reception is achieved using a b.f.o. and side band selection depend on the b.f.o. frequency. You will also find that with this type of receiver you get better results if you turn the volume to maximum and use the r.f. gain control to set the sound level.

One of the next most important aspects of a utility receiver is that of frequency stability. Whilst RTTY reception is bearable on drifting receiver, FAX is just about impossible. This is because a typical FAX chart can take around fifteen minutes to receive. Stability is also very important when receiving some of the more advanced narrow-band modes. In these cases you may well have to leave your station monitoring for considerable periods to receive any interesting messages. This is normally done by leaving the receiver tuned to the chosen frequency and letting your computer store any received text to a disk file. At the end of the monitoring session you can then just quickly review the text file to see what's been going on. This operation is completely impractical if you have to chase signals up and down the band as your receiver drifts!

If you already have an older receiver that suffers drift problems you can take a few steps to minimise the problems. The first point to note is that frequency drift is almost always temperature dependant, so give your receiver plenty of time to warm-up before you start listening. You can also help by ensuring the receiver is kept in a dry environment with as constant a temperature as possible and well clear of any draughts.

Another important point for utility receivers is the minimum tuning steps. A step size of around 10 or 20Hz is ideal, but you can get away with much coarser steps with some decoding systems. If you're using a modern decoding package with an auto tune feature, the program can overcome quite coarse tuning steps at the expense of slightly slower set-up time. If your decoder cannot alter its centre frequency, then you really need to stick with 10 or 20Hz frequency steps. Just to illustrate the point, if you're trying to receive maritime SITOR stations, you will find that the signal has a shift of just 170Hz. If your receiver can only tune in 100Hz steps you can see that you will never achieve accurate tuning as your receiver will always be significantly off-set one way or another. The problem is magnified when you come to receiving those weak DX signals.



JVFAX Main Screen.



JVFAX Configuration screen.



HAMCOMM Receiving Weather Data.

the default shift setting. Just press Alt K, move the highlight bar to 425Hz and press ENTER.

Now we will set the baud rate to 50 baud by pressing Alt S and moving the highlight bar to 50 baud. All that remains now is to set the receive mode to Baudot. To do this type ALT M and move the highlight bar to BAUDOT and press ENTER.

Having completed the software you now need to move on to the interface.

Interface Connection

All you have to do here is plug the 3.5mm jack plug from your interface into the tape out or external speaker socket of your receiver. Next plug the D-type connector into your serial port. If you have a 25-way D-type connector and a 9-pin socket on your computer, don't worry, you can pick-up an adapter from your local electronic or computer store. Make sure you take the interface lead with you and also make a note of whether your computer has a male or female socket. If you have to use the external speaker socket of your receiver you will have discovered that this action cuts out the internal speaker making tuning somewhat difficult!! The solution is to visit your local Tandy, Maplin or similar and buy a 'Y-adapter' and an external speaker. This lets you listen to your receiver through the external speaker and run your decoder from the spare socket. If you have a choice of using the external speaker or 'tape/line' output, always choose the 'tape/line' first. Not only does this overcome the problem of cutting-out the speaker, but it provides a constant level output for the decoder.

Receiver Set-up

This is the final part of the process which should see your first signal decoded. The signal I'm going to start with is not that interesting, but has been chosen because it's very reliable. Turn on your receiver, set the mode to s.s.b. (upper sideband) and tune to 7.646MHz you should hear a strong warbling signal - this is the Hamburg Meteo coded weather station. Depending on the accuracy of your receiver's tuning, you should find this station somewhere between 7.642 and 7.650MHz. You will probably find that all sorts of rubbish is being printed on the screen - don't worry about this for now.

The next stage is to adjust the receiver's tuning so you are in perfect alignment with the signal. Fortunately, *HAMCOMM* has some excellent tools to make this very easy.

On your computer you need to type ALT M followed by P on its own. This should take you to the spectrum analyser display. You should see a pair of fixed vertical lines with some moving lines close by as shown in **Fig. 1**.

HAMCOMM Tuning Display

The object is to adjust the receiver's tuning so that the signal aligns as closely as possible with the two fixed lines. Once you've done this you are correctly tuned to your station.

You now need to press ALT M then highlight Baudot and press ENTER. If you're lucky you should now find groups of five numbers being printed out on the screen. If not then press ALT K and try selecting NORMAL and then REVERSE. If you still don't have any luck run through this procedure:

1. Check the tuning by pressing ALT M then P.
2. Check the main settings e.g. Speed = 50 baud: Keying = 425Hz and Mode = Baudot.

3. Is the signal interference free? If not try again at a different time of day.

I know that receiving a string a five digit groups is hardly exciting, but you can spice this up a bit by pressing ALT T and selecting SYNOP. *HAMCOMM* will then attempt to decode the messages into plain text.

Now that you have had your first success try tuning to 7.658MHz where you will find the TANJUG news agency in Belgrade.

JVFAX

JVFAX version 7.1 is a sophisticated FAX and SSTV decoding and encoding system that can be used by amateurs and short wave listeners alike. One of the important points to note about this program is the interfacing requirements. If, like most, you are using the simple comparator interface you will find that *JVFAX* demands a lot of processor time and may even crash when using older 8088 or 80286 based computers.

Software Installation

As with *HAMCOMM* software installation rather depends on where the program came from. If you've just downloaded the basic compressed program file (normally called *INSJV71.EXE*) you can follow these steps to get it installed on the hard drive.

First of all put *INSJV71.EXE* into the root directory of your C drive and type *INSJV71.EXE*. The self extracting program will then run and install all the program and support files in the appropriate directories on your hard drive. Once its completed you can then delete the main *INSJV71.EXE* archive file from the root directory.

Hardware Installation

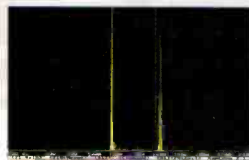
This is exactly the same as for *HAMCOMM* so refer back to that section for guidance. The only point to note here is that although the latest design of comparator interface will work with

both *JVFAX* and *HAMCOMM* this is not the case with some of the very earlier designs. The older interfaces used a different method to extract the local power for the interface.

Software Configuration

We can now move on to configure *JVFAX* to work with your computer system. To do this change to the *JVFAX* sub-directory by typing *cd\jvfax71* from the C:> prompt. Now type *JVFAX* to start the program. If this is the first time you've run the program you will be taken straight to the configuration screen which can be somewhat daunting. Don't worry, there are very few items you have to alter to get started. Just to help you through this stage **Fig. 2** shows a sample screen with the important boxes identified.

As you can see, there are just four sections that need to



HAMCOMM's Spectrum Tuning Display.



HAMCOMM Port Selection Menu.



RadioRaft Manual Mode Selection.

Continued on page 34...

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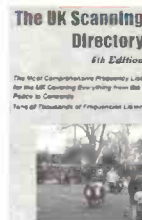
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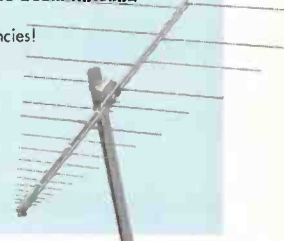
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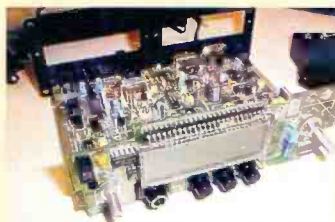
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DAVENTRY CALLING THE WORLD BY NORMAN TOMALIN

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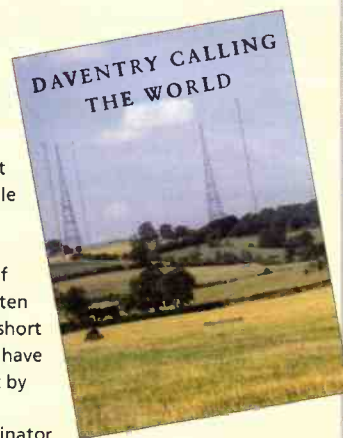
To anyone with even the slightest interest in broadcasting history this privately published, 95-page good quality and well illustrated booklet will provide fascinating reading. I say this because I think there must be many other people who like me, have passed many times up and down the old A5 and the nearby M1 admiring the extensive, and very famous 'aerial farm' that comprised the old Daventry transmitter site.

And again like myself I've no doubt that they also wish they'd been able to visit the station 'as it was' before the multitude of h.f. masts disappeared forever...particularly the most fascinating structure - the giant 'anti-fading' medium wave radiator used for the original 'Third Programme' on medium waves. This incredible mast dominated the Northamptonshire countryside and like the author - I too witnessed it engulfed in a thunderstorm while in the area. Something to remember!

If you've not been fortunate enough to read *BBC Engineering History 1922-1972* by E. Pawley (long out of print but still on some public library shelves) this book provides a superb, personal, detailed and warmly written tribute to a pioneering broadcasting station which during its long service transmitted on long, medium and short waves and provided 'special services' including the famous 49 Metre band radar experiment. But even if you have read Pawley's massive tome (I recommended it) Norman Tomalin's account provides a very 'personal' account by someone who worked there.

Highly readable from the foreword (written I believe by the genuine 'Professor' Stanley Unwin - the originator of the comical 'techno-speak' who entertained us for many years on radio and TV and who also started as a BBC Engineer) right through to the end pages I thoroughly recommend this book. A first class, fascinating read which conveys technical information, life on duty at the station and an inkling of what it was like to work perched up on the top of the famous Borough Hill. **Very highly recommended.**

Daventry calling the World is available from the publishers, post free. Contact: **Caedmon of Whitby, Headlands, 128 Uppang Lane, Whitby, North Yorkshire YO21 3JJ. Tel: (01947) 604646. Price is £7.50.** **Rob Mannion G3XFD**



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be adjusted and we will cover these in order here.

Section 1 - This where new users often slip-up. Because the simple comparator interface connects to the serial port they often mistakenly assume that this setting should be serial - wrong! If you are using the simple comparator the settings shown in the diagram are correct, e.g. 8 bits on COMPARATOR.

Section 2 - This is potentially more troublesome but the vast majority of users should be able to use one of two possible settings. To know which settings to use, you really need to know which COM port your interface is connected to. For most users this will be either COM 1 or COM 2. If you have a serial mouse, this is usually connected to COM 1 so, by default, you must be connected to COM 2. The following table shows the standard settings assigned to each COM port:

COM Port	Address	IRQ
COM 1	03F8	4
COM 2	02F8	3

Section 3 - This section is specific to your computer and printer but it's worth using some simple, less demanding, settings to start with. I recommend leaving the Graphics and T-C graph setting at the standard VGA setting unless you're sure you have 600 x 800 pixel capability. Although this may not fully exploit your display system, it can make for a simpler start. For the printer settings, you need to step through the various options until you see your own printer name or a printer type that your printer can emulate. If in doubt you will need to refer to your printer manual. However, Epson 9-pin is usually a safe starting point.

Section 4 - You will only need to adjust the interrupt frequency if you are using a slow PC. By lowering this value from the pre-set 7500 you progressively reduce the demand on the processor. The disadvantage is a reduction in image resolution.

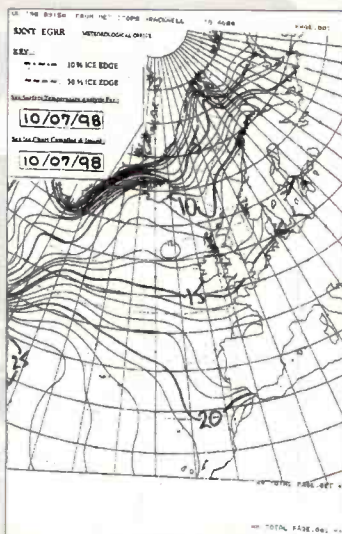
When you've finished changing the settings in the Configuration screen, press Ctrl Enter to return to the main menu.

First FAX Picture

You're now ready to attempt your first FAX picture. For this exercise I'll take you through the steps required to receive weather charts from the Met Office at Bracknell.

1. Tune your receiver to around 4.610 or 8.040MHz u.s.b. where you should either hear a steady carrier or a cyclic grating sound. The carrier shows that the station is at rest, whilst the grating sound means a FAX image is currently being sent.
2. Select FAX option from the JVFX main menu.
3. Press M and select mode 1 WEFAX 576 from the menu.
4. Now press D until the number 400 is displayed. This sets JVFX for the standard h.f. shift of ± 400 Hz.
5. Press T to start the auto-tune function.
6. Next press F2 to enable quick save.
7. If you're happy that the previous steps went OK you can now press 'A' to start the picture capture. If all is OK you should see the picture start to build-up on the screen.

When you have a basic picture, you can carefully alter the receiver tuning to give the best picture. You only need to make



**Hamburg Chart Received Using JVFX.
This is all you need for the Data modes.**

very small adjustments and make sure you leave time for the result of each move to show through into the displayed image.

Once you've cracked your first image you can go back to the configuration screen and try optimising the settings for your set-up.

RadioRaft

This program is comparatively new to the radio scene, but offers the listener access to a wide range of data modes. Perhaps the most

attractive feature of the program, is its ability to automatically analyse data signals, establish the mode and data speed then start decoding the message. This is truly remarkable for a package in this price range and makes it very popular with new listeners. As well as offering excellent facilities *RadioRaft* is also one of the easier programs to set up. Installation of the software is simply a question of following the instructions in the README file and the interface required is the same as that for *HAMCOMM* and *JVFX*.

Configuring the program for your system is simply a question of selecting the appropriate COM port and setting the appropriate interface. This latter setting has caused some confusion in the past but if you're using a *HAMCOMM* type interface you need to select 'AF Interface' from the SETTINGS menu.

One other tip concerns the tuning indicator. Rather than operating as a conventional frequency meter *RadioRaft's* tuning indicator has different functions for each side of the indicator. The indicator sits in the top right-hand corner of the screen and looks like this:

—————<SIGNAL>—————

The hyphens on the left-hand side are used to indicate the error rate of the signal whilst the right-hand side shows the degree of synchronisation. You don't need to get too bothered about this as you just need to make sure you get as many lines as possible for the best reception.

Getting The Software

There are lots of ways to get your hands on these software packages and the associated interfaces. You will find them on sale at just about every radio rally and many of the Internet software archives have ham radio sections with this software. You will also find plenty of adverts for data products in this issue. To help you get started with Internet sources, here are a few sites worth a visit:

www.btinternet.com/~mikespage
[ftp.funet.fi/pub/ham](ftp://funet.fi/pub/ham)
www.pervisell.com
<http://www.gem.net/~berri/wun>
ourworld.compuserve.com/homepages/F6FLT
ourworld.compuserve.com/homepages/klingsenfuss/homepage.htm

I should also make mention of **Pervisell Ltd.** who have provided excellent service to 'Decode' readers for many years now. They can supply registered versions of all the programs mentioned here and also supply a particularly good range of interfaces at very reasonable prices. Pervisell can be found at: **Pervisell Ltd., 8 Temple End, High Wycombe, Bucks HP13 5DR. Tel: (01494) 443033.**



AR8200 *The Superior Concept*

The AR8200 is the 'first' and 'only' (so far) receiver to correctly implement the new 8.33 kHz airband channel step enabling spot on reception with correct tuning and searching. If your main interest is listening to airband it's worth considering the AR8200 as a safe investment beyond 1999.

8.33 kHz tuning step: International governing bodies have recently redefined the VHF airband tuning step to provide additional frequencies, **ultimately many older receivers will not be able to correctly receive these new channels.** Latest information suggests that the new allocation will come into effect on 01.01.1999 for parts of Europe (although this will probably be pushed back another year) and one year later in the UK. Being at 'the cutting edge' the AR8200 supports **8.33 kHz** correctly implemented as eight-and-one-third kHz. This means that the AR8200 will tune the VHF airband displaying the following steps 118.0083(3), 118.0166(6), 118.0250(0) MHz, the end numbers are correctly forced to **33** then **66** then **00**. Most other receivers would incorrectly display **33** then **66** then **99** as the last digits so would quickly drop out of channel synchronisation, further tuning of other receivers would result in the end digits displaying 32, 65, 98 then 31, 64, 97 then 30, 64, 96 etc. If your radio cannot tune in 8.33 kHz steps, you cannot correctly search the new allocation, although tuning within 1 kHz (or tuning in 1 kHz steps) will enable you to hear the traffic, you will not be able to search.

Selectivity is not a problem with the AR8200 as a narrow AM bandwidth is also supported (although undoubtedly the geographical allocation of tightly allocated channels will be taken into consideration by the governing bodies?). The AR8200 channel steps may also be programmed in multiples of 50 Hz in any mode. Extensive step-adjust and frequency offset facilities are also provided to ensure accurate tracking of the most obscure band plans. A wide frequency coverage is available from 530 kHz to 2040 MHz with no gaps.

A.F.C.: Automatic Frequency Control is included for spot on tuning ensuring that nothing is missed, this is especially useful for monitoring offset transmissions of London ATC etc without the need to retune.

Alpha text: A larger than average back lit LCD with contrast control provides operational data. Alphanumeric text comments of up to 12 characters may be added to memory channels, memory banks and search banks (for example **MANCHEST APP**) for easy identification reducing the need for a complex list or data base.

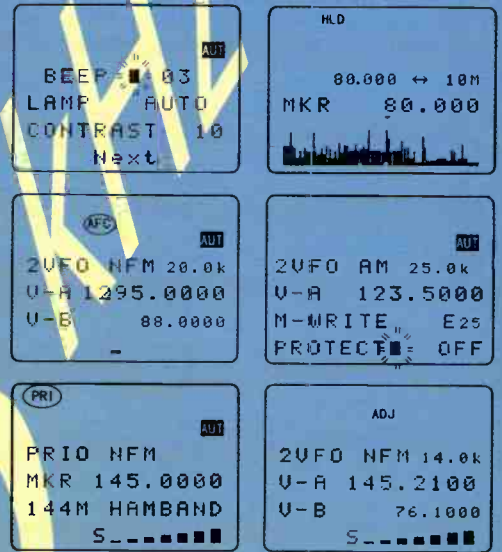
A text search feature simplifies recall of stored information.

Band scope: A high resolution signal meter and **multi-function band scope** is provided, this enables you to visually interrogate up to 10 MHz bandwidth at a time for activity, peak hold assists location of unusual or sporadic transmissions. **Flexible dynamic memory bank layout** is provided (memory banks may be varied in size between 10 and 90 channels each i.e. bank 'A' 80 channels / bank 'a' 20 channels with bank 'B' 40 channels / bank 'b' 60 channels etc). 1,000 memories, 20 memory banks, 40 search banks, select scan list, priority and lockout facilities are included. It is also possible to edit and delete individual memories, swap, copy, move and delete whole banks including dumping all data.

Computer control is available via a metallic side mounted robust connector and optional lead, an extensive RS232 command list is supported. A software package is under development which will be made available as an internet **free** download over the coming months. This connector also supports clone of data between two AR8200 along with tape output, detector output, mute and AGC. Optional **internal SLOT CARDS** (which fit into the AR8200 base) extend the AR8200 capability even further: **Memory slot card** (increase storage to 4,000 memories, 160 search banks). **CTCSS slot card** squelch & search. **Record chip slot card** (records up to 20 seconds of audio). **Tone eliminator slot card**, **Voice inverter slot card**. The **side keypad** provides four arrow keys presented as a single 'rocker' resulting in more natural and intuitive navigation through the on-screen menus. Tuning is accomplished via a variety of controls including a side panel indented main tuning dial, arrow keys and keypad. The scratch resistant "military green" cabinet has a quality feel.

Supplied with: NiCads, charger, cigar lead, whip aerial, MW bar, belt hook & screws, strap, operating manual

£399.00



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Spectrum monitoring for AOR ICOM and KENWOOD receivers...

It is not a common sight to see an ICOM receiver featured in an AOR advertisement, this is a special occasion demonstrating the COMPATIBILITY between the AOR SDU5000 Spectrum Display Unit with both AOR and ICOM receivers (AOR AR5000, AR3000A, ICOM R8500, R7100, R7000, R9000).



The SDU5000 Spectrum Display Unit adds a variety of features to extend your receiver's capabilities, such as visually identifying new active frequencies and taking measurements. The SDU5000 may be used with a number of receivers (which have a 10.7 MHz I.F. output) and provides a bandwidth up to ± 5 MHz in 1 kHz increments with a resolution of 5 kHz or 30 kHz. When using selected AOR and ICOM receivers, the frequency, mode (& attenuator with some sets) may be controlled from the SDU5000 so that a displayed frequency may be easily monitored and the cursor frequency of the SDU5000 is equal to the receive frequency of the radio. Of course the SDU5000 also makes an excellent band scope so that adjacent channel activity may be constantly monitored, this is particularly popular with frequency management organisations. The SDU5000 may also be connected to a PC where all controls are accessible and display data can be downloaded for record and later analysis, you may measure the frequency and signal strength of historical events!

AOR products are sold by many dealers large and small. Below is a sample of the most "active" dealers in the UK who procure stock and have the full after-sales support of AOR (UK) LTD. All main equipment supplied by AOR (UK) LTD carries a silver label on the carton stating that distribution has been via AOR (UK), this is your assurance of after-sales service. The list appears in no particular order.... It is advisable to contact dealers prior to travelling to check availability of products.

- **Waters & Stanton**
Essex Tel: 01702 206835
- **ASK Electronics Ltd**
London Tel: 0171 637 0353
- **Martin Lynch & Son**
London Tel: 0181 566 1120
- **Haydon Communications**
London 0181 951 5781
West Mids Tel: 01384 481681
- **Nevada Communications**
Portsmouth Tel: 01705 662145
- **South Midland Comm. Ltd**
Eastleigh Tel: 01703 255111
- **Reg Ward & Co**
Devon Tel: 01297 34918
- **ARC - Amateur Radio Comms**
Merseyside Tel: 01925 229881
- **Lowe Electronics**
Matlock Tel: 01629 580800
Newcastle Tel: 0191 214 5424
Bristol Tel: 0117 931 5263
Plymouth Tel: 01752 257224
- **S.R.P. Trading**
Worcestershire Tel: 01562 730672
Birmingham Tel: 0121 460 1581
- **Photo Acoustic Ltd**
Bucks. Tel: 01908 610625
- **Javiation**
West Yorkshire Tel: 01274 732146
- **Northern Shortwave Centre**
Cumbria Tel: 01228 590011
- **Jaycee Electronics Ltd**
Fife Tel: 01592 756962
- **The Shortwave Shop**
Dorset Tel: 01202 490099
- **Air Supply**
Leeds Tel: 0113 250 9581
- **RAS**
Nottingham Tel: 0115 928 0267
- **CB37 Communications**
Cheshire Tel: 01270 588440
- **Link Electronics**
Peterborough Tel: 01733 345731
- **QSL Communications**
Weston Super Mare Tel: 01934 512 757
- **EARS**
Essex Tel: 01268 752522
- **Micron Services**
Belfast Tel: 01232 438610
- **Radio & Electronics Services**
Guernsey Tel: 01481 728837
- **Belgar Ltd**
Jersey Tel: 01534 877067
- **Long Communications**
Co. Donegal Tel: 00 353 733 7323
- **Waterford Communications Centre**
Waterford Tel: 00 353 88 532656

Of course the SDU5000 also makes an excellent band scope so that adjacent channel activity may be constantly monitored, this is particularly popular with frequency management organisations. The SDU5000 may also be connected to a PC where all controls are accessible and display data can be downloaded for record and later analysis, you may measure the frequency and signal strength of historical events!

Other receivers. It is also possible to connect the SDU5000 to other receivers which provide a suitable (wide) I.F. output at 10.7 MHz (or in the range of 5.7 to 15.6 MHz) such as the **KENWOOD TS870S**.



You can reprogramme the SDU5000 centre frequency (front panel) when using other receivers which use different IF frequencies (Kenwood, Yaesu etc). In the case of the **Kenwood TS870S** the I.F. frequency is set to 8.83 MHz and results are good over a 50dB range. See the note at the end of the specification section of the revised sales leaflet for more examples... in practical terms the IF should be between 8.2 - 13.2 MHz for a 5 MHz span. **SDU5000 £699**

HAWK5000 is an optional **Windows PC software package** designed specifically for the SDU5000. **£49**

For further details please contact your dealer.
Dealers currently participating in a SDU5000 promotion are identified by a star *

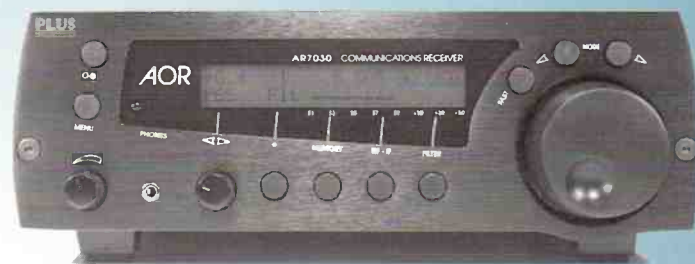
AR5000 True high performance, voted best wide band receiver by readers of the German "funk" magazine in 1997. **£1345**

The enhanced **AR5000+3** includes AFC, Synchronous AM and noise blanker, voted best wide band receiver by readers of the German "funk" magazine in 1998. **£1574**



AR7030 High dynamic range, short wave receiver, awarded table-top receiver of the year 1996/97 by WRTH and 5-star editor's choice by Passport to World Band Radio 1997 & 98. Supplied with mains power unit, infrared hand control & comprehensive operating manual. **£799**

AR7030 PLUS Enhanced version, fitted with narrow AM filter, optical encoder, features CPU with 400 memory channels with alpha-tag, optimised components for highest performance. **£949**



AR3000A Evolution at its very best. Wide band all mode receiver, high performance, respected best seller. **£699**

Although the AR8200 has arrived, the AR8000 is still in production and in great demand, a testimony to its carefully thought-out design concept. This unit provides a cost effective answer to those seeking wide frequency coverage, all mode reception and computer control features in a hand-held package. Frequency coverage is 500kHz to 1900MHz with no gaps, AM, NFM, WFM, USB, LSB, CW. Computer port and Opto Scout compatibility (optional leads & interface required). **£299**



ARD-2 ACARS & NAVTEX decoder and display unit. Very simple to use, only one audio connection is required from a suitable receiver. Can be used portable from internal batteries or external 12V. A computer port is provided for enhancement but is not required for operation.

FREE display software is available from the AOR web site **£295**



DECODE SPECIAL...DECODE SPECIAL...DECODE SPECIAL...DECODE SPECIAL...DECODE SPECIAL...

COQ-8

Freq	Callsign	Station	ITU	Mode	Settings
6.7213		Unidentified		COQ-8	26.7
6.8113		Algerian Customs		COQ-8	26
9.1186		Algerian Embassy Rabat		COQ-8	26.6
10.4673		Algerian MOI Net		COQ-8	26.6
13.4284		MFA Algiers		COQ-8	26.6
16.2786		Unidentified		COQ-8	26.6
16.2813		MFA Algiers		COQ-8	26.6
16.3412		MFA Algiers		COQ-8	26.6
16.3413		Unidentified		COQ-8	26.6
18.1834		MFA Algiers		COQ-8	26.6
18.2025		MFA Algiers		COQ-8	26.7
18.5294		Algerian Embassy Geneva		COQ-8	26.6
19.0336		Algerian Embassy Accra		COQ-8	26.6
19.0364		MFA Algiers		COQ-8	26.7
19.0564		Algerian Embassy Yaounde		COQ-8	26.67
		Unidentified		COQ-8	26

CW

Freq	Callsign	Station	ITU	Mode	Settings
2.5795	9VG	Singapore Radio	SWG	CW	
4.213	VIP	Perth Radio	AUS	CW	
4.2285	VIM	Melbourne Radio	AUS	CW	
4.2325	VRX8	Hong Kong Radio	CHN	CW	
4.245	VIS	Sydney Radio	AUS	CW	
4.2633	ZLO	Waiouru Radio	NZL	CW	
4.274	GKB4	Portishead Radio	G	CW	
4.274	KFS	Palo Alto Radio	USA	CW	
4.275	HPP	Panama Radio	PNR	CW	
4.276	JNA	JMSA Tokyo Radio	J	CW	
4.3055	JNA	JMSA Tokyo Radio	J	CW	
4.340	XSQ	Guangzhou Radio	CHN	CW	
5.2375	FDI22	AF Narbonne	F	CW	
5.270	FDG	AF Bordeaux	F	CW	
5.342	FDV	AF Orleans	F	CW	
5.880	RMP	RUS by Katinograd	KAL	CW	
6.330	XSG	Shanghai Radio	CHN	CW	
6.3855	ZS13	Ny Capetown	AFS	CW	
6.389	CTP	Ny Oeiras	POR	CW	
6.470	SXA34	Ny Spata Attikis	GRC	CW	
6.4845	W5C	Tuckerton Radio	USA	CW	
6.4915	JOS	Nagasaki Radio	J	CW	
7.335	FDG	AF Metz	F	CW	
7.3355	FDG	AF Metz	F	CW	
7.4705	FDG	AF Metz	F	CW	
7.4725	FDG	AF Bordeaux	F	CW	
7.668	88Y	INTEL	F	CW	
8.4175	XSV	Tianjin Radio	CHN	CW	
8.420	KHF	Agana Radio	GUM	CW	
8.4215	VRX	Hong Kong Radio	CHN	CW	
8.422	NRV	USCG Guam	GUM	CW	
8.423	UFL	Vladivostok Radio	RUS	CW	
8.4265	9VG	Singapore Radio	SWG	CW	
8.427	KPH	San Francisco Radio	USA	CW	
8.4295	NMO	USCG Honolulu	HHI	CW	
8.430	XSG	Shanghai Radio	CHN	CW	
8.4305	WLO	Mobile Radio	USA	CW	
8.435	XSQ	Guangzhou Radio	CHN	CW	
8.437	4XZ	Ny Haifa	ISR	CW	
8.4406	UAT	Moskva Radio	URS	CW	
8.4445	KFS	Palo Alto Radio	USA	CW	
8.448	A9M	Bahrain Radio	BHR	CW	
8.450	RUF	Sevastopol Radio	UKR	CW	
8.450	SAA	Karlskrona Radio	S	CW	
8.457	OFJ	Helsinki Radio	FINL	CW	
8.457	PKP	Dumai Radio	INS	CW	
8.473	PKE	Amboina Radio	INS	CW	
8.4735	A7D	Doha Radio	QAT	CW	
8.484	HLF	Seoul Radio	KOR	CW	
8.487	XSG	Shanghai Radio	CHN	CW	
8.491	AQP5	Ny Karachi	PAK	CW	
8.502	XSG	Shanghai Radio	CHN	CW	
8.505	UFZ	Vladivostok Radio	RUS	CW	
8.510	UBB4	Kaliningrad Radio	KAL	CW	
8.511	XSW2	Tai-chung Radio	TWN	CW	
8.514	XSQ	Guangzhou Radio	CHN	CW	
8.515	SAT	Tripoli Radio	LYB	CW	
8.521	VIP	Perth Radio	AUS	CW	
8.522	9HW20	Kuching Radio	MLE	CW	
8.532	LZW40	Varna Radio	BUL	CW	
8.540	USU	Mariupol Radio	UKR	CW	
8.542	PKQ2	Jakarta Radio	INS	CW	
8.5515	CTP	Ny Oeiras	POR	CW	
8.555	TBB7	Ny Ankara	TUR	CW	
8.5595	GK84	Portishead Radio	G	CW	
8.565	D3E51	Luanda Radio	AGL	CW	
8.566	ZS14	Ny Capetown	AFS	CW	
8.570	WNU53	Slidell Radio	USA	CW	
8.571	JNA	JMSA Tokyo Radio	J	CW	
8.573	CLA21	Havana Radio	CUB	CW	
8.577	HLO	Seoul Radio	KOR	CW	
8.584	VRX	Hong Kong Radio	CHN	CW	
8.586	WCC	Chatham Radio	USA	CW	
8.589	HPP	Panama Radio	PNR	CW	
8.593	UII	Odessa Radio	UKR	CW	
8.605	UIW	Kaliningrad Radio	KAL	CW	
8.6165	URK9	Kertch Radio	UKR	CW	
8.618	KPH	San Francisco Radio	USA	CW	
8.624	1150	Guangzhou Radio	CHN	CW	
8.632	XSW	Kaoshiung Radio	TWN	CW	
8.634	PPR	Rio Radio	B	CW	
8.634	VTG6	Ny Bombay	IND	CW	
8.6365	HLW	Seoul Radio	KOR	CW	
8.650	SPB43	Szczecin Radio	POL	CW	
8.658	ASK	Karachi Radio	PAK	CW	
8.661	XSQ	Guangzhou Radio	CHN	CW	
8.6642		unknown		CW	
8.665	XSG	Shanghai Radio	CHN	CW	
8.6885	ZSC6	Capetown Radio	AFS	CW	
8.691	XST	Qingdao Radio	CHN	CW	
8.698	7TF6	Boufarik Radio	ALG	CW	

8.700	9AR	Rijeka Radio	HRV	CW	
8.7054	PKN	Balikpapan Radio	INS	CW	
12.662	7TF8	Boufarik Radio	ALG	CW	
12.675	SAA	Karlskrona Radio	S	CW	
12.678	9MG	Penang Radio	MLA	CW	
12.6825	PKE	Amboina Radio	INS	CW	
12.687	OFJ32	Helsinki Radio	FINL	CW	
12.6938	ZRQ5	Ny Capetown	AFS	CW	
12.697	USU	Mariupol Radio	UKR	CW	
12.700	XSQ4	Guangzhou Radio	CHN	CW	
12.709	A9M	Bahrain Radio	BHR	CW	
12.712	HLW	Seoul Radio	KOR	CW	
12.721	SPH51	Gdynia Radio	POL	CW	
12.725	UG1	Rogaland Radio	NOR	CW	
12.735	URL	Sevastopol Radio	UKR	CW	
12.7385	PPR	Rio Radio	B	CW	
12.748	IRM	Roma Medici Radio	I	CW	
12.765	UCW4	St. Petersburg Radio	RUS	CW	
12.771	LHP5	St. Petersburg Radio	RUS	CW	
12.780	D3E61	Luanda Radio	AGL	CW	
12.7803	9AR	Rijeka Radio	HRV	CW	
12.7995	PCH51	Scheveningen Radio	HOL	CW	
12.801	TAH	Istanbul Radio	TUR	CW	
12.8085	VTG7	Ny Bombay	IND	CW	
12.8235	CTP	Ny Oeiras	POR	CW	
12.8354	GKB5	Portishead Radio	G	CW	
12.838	URK9	Kertch Radio	UKR	CW	
12.843	HLO	Seoul Radio	KOR	CW	
12.849	ZS15	Ny Capetown	AFS	CW	
12.856	XSG	Shanghai Radio	CHN	CW	
12.864	XSW	Kaoshiung Radio	TWN	CW	
12.8875	EAD44	Madrid Radio	E	CW	
12.891	UFN	Novorossiisk Radio	RUS	CW	
12.910	UAT	Moskva Radio	RUS	CW	
12.9165	QXZ6	Lyngby Radio	DNK	CW	
12.923	HLW2	Seoul Radio	KOR	CW	
12.935	HLG	Seoul Radio	KOR	CW	
12.939	SP61	Szczecin Radio	POL	CW	
12.940	LZW51	Varna Radio	BUL	CW	
12.9525	VIP	Perth Radio	AUS	CW	
12.965	USO5	Ismail Radio	UKR	CW	
12.973	UIW	Kaliningrad Radio	KAL	CW	
12.9885	LPD88	General Pacheco Radio	ARG	CW	
13.012	AQP6	Ny Karachi	PAK	CW	
13.0155	IAR3	Roma Radio	I	CW	
13.0245	ASK	Karachi Radio	PAK	CW	
13.029	SVB5	Athen Radio	GRC	CW	
13.050	UDK2	Murmansk Radio	RUS	CW	
13.062	CLA32	Havana Radio	CUB	CW	
13.0695	JOS	Nagasaki Radio	J	CW	
13.5279	S	Ny Arkhangelsk	RUS	CW	
13.528	C	Ny Moscow	RUS	CW	
16.807	9VG	Singapore Radio	SWG	CW	
16.8075	GKE6	Portishead Radio	G	CW	
16.8075	ZLA	Awanui Radio	NZL	CW	
16.8095	EAD	Madrid Radio	E	CW	
16.8095	VIP	Perth Radio	AUS	CW	
16.8115	A9M	Bahrain Radio	BHR	CW	
16.8125	NRV	USCG Agana	GUM	CW	
16.813	UAT	Moskva Radio	RUS	CW	
16.8185	9VG	Singapore Radio	SWG	CW	
16.821	VRX	Hong Kong Radio	CHN	CW	
16.8225	9VG	Singapore Radio	SWG	CW	
16.880	XSQ	Guangzhou Radio	CHN	CW	
16.892	XSG	Shanghai Radio	CHN	CW	
16.910	HLW	Seoul Radio	KOR	CW	
16.9112	JNA	JMSA Tokio	J	CW	
16.9155	CBV	Playa Ancha Radio	CHL	CW	
16.932	7TF10	Boufarik Radio	ALG	CW	
16.9332	JOS	Nagasaki Radio	J	CW	
16.940	XSW	Kaoshiung Radio	TWN	CW	
16.9426	9AR	Rijeka Radio	HRV	CW	
16.966	SVB6	Athen Radio	GRC	CW	
16.974	SPE	Szczecin Radio	POL	CW	
16.986	CTP	Ny Oeiras	POR	CW	
16.987	VRX81	Hong Kong Radio	CHN	CW	
16.9928	UAT	Moskva Radio	RUS	CW	
17.011	TBO3	Ny Izmir	TUR	CW	
17.011	XSX	Keelung Radio	TWN	CW	
17.013	5BA	Cyprus Radio	CYP	CW	
17.0216	TAH	Istanbul Radio	TUR	CW	
17.0456	LPD46	General Pacheco Radio	ARG	CW	
17.0503	4XZ	Ny Haifa	ISR	CW	
17.0504	ASK	Karachi Radio	PAK	CW	
17.053	XSX	Keelung Radio	TWN	CW	
17.0648	EDZ6	Madrid Radio	E	CW	
17.0742	LGX	Rogaland Radio	NOR	CW	
17.0948	SVA6	Athens Radio	GRC	CW	
17.103	XSG	Shanghai Radio	CHN	CW	
17.105	IRM	Roma Medico Radio	I	CW	
17.113	GKB6	Portishead Radio	G	CW	
17.1416	USU	Mariupol Radio	UKR	CW	
17.145	LZW72	Varna Radio	BUL	CW	
17.147	URL	Sevastopol Radio	UKR	CW	
17.1724	9MG	Penang Radio	MLA	CW	
17.1752	A9M	Bahrain Radio	BHR	CW	
17.177	URK9	Kertch Radio	UKR	CW	
17.1848	KFS	Palo Alto Radio	USA	CW	
17.1989	PCH	Scheveningen Radio	HOL	CW	
17.206	IAR	Rome Radio	I	CW	
17.2387	PKX	Jakarta Radio	INS	CW	
22.459	XSX	Keelung Radio	TWN	CW	
22.512	UAT	Moskva Radio	RUS	CW	
22.5637	9AR9	Rijeka Radio	HRV	CW	
22.5755	PKX	Jakarta Radio	INS	CW	
22.5765	JNA	JMSA Tokyo Radio	J	CW	

CW + SITOR

Freq	Callsign	Station	ITU	Mode	Settings
8.467	LF	Rogaland Radio	NOR	CW + SITOR	
8.417	GKE4	Portishead Radio	G	CW + SITOR	
8.418	IAR	Rome Radio	I	CW + SITOR	
8.4185	LGB2	Rogaland Radio	NOR	CW + SITOR	

DECODE SPECIAL...DECODE SPECIAL...DECODE SPECIAL...DECODE SPECIAL...DECODE SPECIAL...

DECODE SPECIAL...DECODE SPECIAL...DECODE SPECIAL...DECODE SPECIAL...DECODE SPECIAL...

8.419	VIP33	Perth Radio	AUS	CW + SITOR	5.2850	RPN 75	Kyjev Meteo	UKR	FAX	90/576
8.4195	PPR	Rio Radio	B	CW + SITOR	5.3025		Centro Met Ed Frei	ATA	FAX	120/576
8.4205	9VG78	Singapore Radio	SNG	CW + SITOR	5.3360	RBW 41	Murmansk Meteo	RUS	FAX	120/576
8.4205	HEC18	Bern Radio	SUI	CW + SITOR	5.3470	RSW 71	Arkhangelsk Meteo	RUS	FAX	60/576
8.421	OXZ	Lyngby Radio	DNK	CW + SITOR	5.4050	JM1 2	Tokyo Meteo 1	J	FAX	120/576
8.4215	9AR	Rijeka Radio	HRV	CW + SITOR	5.5264	BAF 6	Beijing Meteo	CHN	FAX	120/576
8.422	ESA	Tallinn Radio	EST	CW + SITOR	5.7050	LOR	Puerto Belgrano	ARG	FAX	120/576
8.4225	USU	Mariupol Radio	UKR	CW + SITOR	5.7550	AXI 32	Darwin Meteo	AUS	FAX	120/576
8.4255	HEC28	Bern Radio	SUI	CW + SITOR	5.807	ZKLF	Wellington Meteo	NZL	FAX	120/576
8.4265	WCC	Chatham Radio	USA	CW + SITOR	5.8071	ZKLF	Auckland Meteo	NZL	FAX	120/576
8.427	OXZ	Lyngby Radio	DNK	CW + SITOR	5.8502	OXT	Copenhagen Meteo	DNK	FAX	120/576
8.4275	A9M	Bahrain Radio	BHR	CW + SITOR	5.8577	HLL B	Seoul Meteo	KOR	FAX	120/576
8.4275	5PA46	Gdynia Radio	POL	CW + SITOR	5.8695	RBV 78	Tashkent Meteo 2	UZB	FAX	90/576
8.428	NMN	USCG Camslant	USA	CW + SITOR	5.9080	AF5	USAF AWS Elk Horn	USA	FAX	120/576
8.4285	PCH46	Scheveningen Radio	HOL	CW + SITOR	6.3405	NMF	USCG Boston	USA	FAX	120/576
8.429	EAD	Madrid Radio	E	CW + SITOR	6.4451		Murmansk Meteo	RUS	FAX	120/576
8.431	TAH	Istanbul Radio	TUR	CW + SITOR	6.4525	GYA	RN London	G	FAX	120/576
8.4315	LIAT	Moskau Radio	RUS	CW + SITOR	6.4530	NPG	USN San Francisco	USA	FAX	120/576
8.433	8PO	Barbados Radio	BRB	CW + SITOR	6.4560	CKN	CF Vancouver	CAN	FAX	120/576
8.4345	LPD	General Pacheco Radio	ARG	CW + SITOR	6.4964	CFH	CF Halifax	CAN	FAX	120/576
8.435	VCT	Tors Cove Radio	CAN	CW + SITOR	6.7200	RPN 71	Kyjev Meteo	UKR	FAX	90/576
8.459	LSD836	Argentina Radio	ARG	CW + SITOR	6.7900	YMA 20	Ankara Meteo	TUR	FAX	90/576
8.541	A9M	Bahrain Radio	BHR	CW + SITOR	6.9060	AFS	USAF AWS Elk Horn	USA	FAX	120/576
12.678	LFI	Rogaland Radio	NOR	CW + SITOR	6.9151	XL1763	Charlottetown Radio	CAN	FAX	120/576
12.7565	A9M	Bahrain Radio	BHR	CW + SITOR	6.9170	CZW	Maritim Air Group	CAN	FAX	120/576
16.8145	CBV	Playa Ancha Radio	CHL	CW + SITOR	6.9500	RJK 78	Kyjev Meteo	UKR	FAX	90/576
16.8155	9VG	Singapore Radio	SNG	CW + SITOR	7.3050	JMH 2	Tokyo Meteo 2	J	FAX	120/576
16.8155	OXZ	Lyngby Radio	DNK	CW + SITOR	7.3950	HSW 64	Bangkok Meteo	THA	FAX	120/576
16.8195	NMN	USCG Camslant	USA	CW + SITOR	7.3980		USAF AWS Roosevelt	PTR	FAX	120/576
16.825	WCC	Chatham Radio	USA	CW + SITOR	7.4050	ATP 57	Delhi Meteo	IND	FAX	120/576
16.826	ESA	Tallinn Radio	EST	CW + SITOR	7.4200	BDF	Shanghai Meteo	CHN	FAX	120/576
16.8265	PCH65	Scheveningen Radio	HOL	CW + SITOR	7.4335	HLL 5	Seoul Meteo	KOR	FAX	120/576
16.8385	BAR	Rijeka Radio	HRV	CW + SITOR	7.4650	SYE	Nairobi Meteo	KEN	FAX	120/576
16.8415	BPO	Barbados Radio	BRB	CW + SITOR	7.4700	VLM	Casey Meteo (summer)	ATA	FAX	120/576
16.868	9VG48	Singapore Radio	SNG	CW + SITOR	7.4950	RDK 23	Tbilisi Meteo	GEO	FAX	90/576
16.869	KHF	Guam Radio	GUM	CW + SITOR	7.5080	ZRO 2	Pretoria Meteo	AFS	FAX	120/576
16.879	LZV67	Varna Radio	BUL	CW + SITOR	7.5350	AXI 33	Darwin Meteo	AUS	FAX	120/576
16.886	TAH	Istanbul Radio	TUR	CW + SITOR	7.5700	RBX 72	Tashkent Meteo 2	UZB	FAX	90/576
16.893	USU	Mariupol Radio	UKR	CW + SITOR	7.5820	NKW	USN Diego Garcia	DGA	FAX	120/576
16.8985	LIAT	Moscow Radio	RUS	CW + SITOR	7.5950	AOK	USN Rota	E	FAX	120/576
16.976	LSD836	Argentina Radio	ARG	CW + SITOR	7.6300	RNR 78	Rostov na Donu	RUS	FAX	90/576
17.0665	A9M	Bahrain Radio	BHR	CW + SITOR	7.6700		Moscow Meteo	RUS	FAX	120/576
19.685	WLO	Mobile Radio	USA	CW + SITOR	7.6850		Moscow Meteo	RUS	FAX	120/576
19.692.5	ZSC	Capetown Radio	AFS	CW + SITOR	7.7020	RTP 72	Irkutsk Meteo	RUS	FAX	90/576
19.697	SVN63	Athens Radio	GRC	CW + SITOR	7.7100	VFR	CCG Resolute	CAN	FAX	120/576
19.726	A9M	Bahrain Radio	BHR	CW + SITOR	7.7620	RGH 77	Arkhangelsk Meteo	RUS	FAX	60/576
					7.8450		Khabarovsk Met	FAX	90/576	
					7.8700		USAF AWS Roosevelt	PTR	FAX	120/576
					7.8800	DDK 3	Hamburg Meteo	D	FAX	120/576
					7.9088		Murmansk Meteo	RUS	FAX	120/576
					7.9680	RFU 7	Rostov na Donu	RUS	FAX	90/576
					8.0400	GFA 23	Bracknell Meteo	G	FAX	120/576
					8.0800	NVA	USN Cuttler	USA	FAX	120/576
					8.0830	RJ1 75	Tashkent Meteo 1	UZB	FAX	90/576
					8.1039	SVA 4	Athens Radio	GRC	FAX	120/576
					8.1220	BAF 36	Beijing Meteo	CHN	FAX	120/576
					8.1400	BMB	Tai-pei Meteo	TAI	FAX	120/576
					8.1466	IMB 55	Rome Meteo	I	FAX	120/576
					8.1760	FZR 81	Saint Denis Meteo	REU	FAX	120/576
					8.3022		Beijing Meteo	CHN	FAX	120/576
					8.3315	GYA	RN London	G	FAX	120/576
					8.4440		Murmansk Meteo	RUS	FAX	120/576
					8.459	NOJ	Kodiak Meteo stn	ALS	FAX	120/576
					8.4675	JJC	Tokyo Radio	J	FAX	120/576
					8.4940	NUD	USN Adak	ALS	FAX	120/576
					8.5039	NMG	USCG New Orleans	USA	FAX	120/576
					8.6772	CBV	Valparaiso Radio	CHL	FAX	120/576
					8.682	NMC	USCG San Francisco	USA	FAX	120/576
					9.0445	AOK	USN Rota	E	FAX	120/576
					9.0450	SYE	Nairobi Meteo	KEN	FAX	120/576
					9.0502	AOK	USN Rota	E	FAX	120/576
					9.0500	NPG	USN San Francisco	USA	FAX	120/576
					9.1000	ROO 72	Rostov na Donu	RUS	FAX	90/576
					9.1100	NMF	USCG Boston	USA	FAX	120/576
					9.1500	RCH 73	Tashkent Meteo 1	UZB	FAX	90/576
					9.1650		Seoul Meteo	KOR	FAX	120/576
					9.3180	NRK	USN Keflavik	ISL	FAX	120/576
					9.340	RCH72	Tashkent Meteo	RUS	FAX	120/576
					9.3600	OXT	Copenhagen Meteo	DNK	FAX	120/576
					9.4300	3MA 34	CNA Tai-pei	TAI	FAX	120/576
					9.4380	JM1 3	Tokyo Meteo 1	J	FAX	120/576
					9.4586	ZKLF	Auckland Meteo	NZL	FAX	120/576
					9.9510	LSB	Centro Mt. Marambio	ATA	FAX	120/576
					9.9700	JMH 3	Tokyo Meteo 2	J	FAX	120/576
					9.9825	KVM 70	Honolulu Meteo	HWA	FAX	120/576
					10.1070	ATE 60	Delhi Meteo	IND	FAX	120/576
					10.1170	BAF 4	Beijing Meteo	CHN	FAX	120/576
					10.1210	SUU 2	Cairo Meteo	EGY	FAX	120/576
					10.1300	RBW 48	Murmansk Meteo	RUS	FAX	120/576
					10.2070	RTP 78	Irkutsk Meteo	RUS	FAX	90/576
					10.2423	LOR	Puerto Belgrano	ARG	FAX	120/576
					10.2533	NPN	USN Apra Harbour 1	GUM	FAX	120/576
					10.2567	NPN	USN Apra Harbour 2	GUM	FAX	120/576
					10.5380	CFH	CF Halifax	CAN	FAX	120/576
					10.5420	AOK	USN Rota	E	FAX	120/576
					10.555	ZKLF	Wellington Meteo	NZL	FAX	120/576
					10.5550	AXI 34	Darwin Meteo	AUS	FAX	120/576
					10.8650	NAA	USN Cuttler	USA	FAX	120/576
					10.9800		Moscow Meteo	RUS	FAX	120/576
					11.0300	AXM 34	Melbourne Meteo	AUS	FAX	120/576
					11.0900	XVM 70	Honolulu Meteo	HWA	FAX	120/576
					11.1220	AFS	USAF AWS Elk Horn	USA	FAX	120/576
					11.4200	BDF	Shanghai Meteo	CHN	FAX	120/576
					11.455.0	VLM	Casey Meteo (summer)	ATA	FAX	120/576
					11.4757	HMF 52	KNCA Pyongyang	KRE	FAX	60/352
					11.6179		Moscow Meteo	RUS	FAX	90/576
					11.6220		USAF AWS Roosevelt	PTR	FAX	120/576
					11.6625		Centro Met Ed Frei	ATA	FAX	120/576
					12.3168	SYE	Nairobi Meteo	KEN	FAX	120/576
					12.6620	PIWZ	Rio de Janeiro	B	FAX	120/576
					12.7300	NMC	USCG San Francisco	USA	FAX	120/576
					12.7455	JIC	Tokyo Radio	J	FAX	120/576
					12.7500	NMF	USCG Boston	USA	FAX	120/576
					12.7530	CKN	CF Vancouver	CAN	FAX	120/576

DSC

Freq	Callsign	Station	ITU	Mode	Settings
2.1875		GMDSS Alert Chan		DSC	100/170
6.3120		GMDSS Alert Chan		DSC	100/170
8.4145		GMDSS Alert Chan		DSC	100/170

FAX

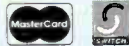
Freq	Callsign	Station	ITU	Mode	Settings
0.1225	CFH	CF Halifax	CAN	FAX	120/576
2.0520	NOJ	USCG Kodiak	ALS	FAX	120/576
2.3420	DHJ 51	Grenfell Meteo	D	FAX	120/576
2.4010	LSB	Centro Mt. Marambio	ATA	FAX	120/576
2.6185	GFE 25	Bracknell Meteo	G	FAX	120/576
2.6280	AXM 31	Melbourne Meteo	AUS	FAX	120/576
2.7545	CKN	CF Vancouver	CAN	FAX	120/576
3.2315	DHJ 51	Grenfell Meteo	D	FAX	120/576
3.2320	AFS	USAF AWS Elk Horn	USA	FAX	120/576
3.2530	VFF	CCG Iqaluit	CAN	FAX	120/576
3.2530	VFR	CCG Resolute	CAN	FAX	120/576
3.2800	RBX 70	Tashkent Meteo 1	UZB	FAX	90/576
3.3570	NAA	USN Cuttler	USA	FAX	120/576
3.3600	RPN 71	Kyjev Meteo	UKR	FAX	90/576
3.3650	JM1	Tokyo Meteo 1	J	FAX	120/576
3.3774	YMA 20	Ankara Meteo	TUR	FAX	90/576
3.6100	ROO 70	Rostov na Donu	RUS	FAX	90/576
3.6225	JMH	Tokyo Meteo 2	J	FAX	120/576
3.6520	GYA	RN London	G	FAX	120/576
3.6570	RVZ 73	Arkhangelsk Meteo	RUS	FAX	60/576
3.6800	RBV 70	Tashkent Meteo 1	UZB	FAX	90/576
3.7450	RIS 70	Tbilisi Meteo	GEO	FAX	90/576
3.8205	NRK	USN Keflavik	ISL	FAX	120/576
3.8550	DDH 3	Hamburg Meteo	D	FAX	120/576
3.8630		Moscow Meteo	RUS	FAX	120/576
4.0140	ZRO	Pretoria Meteo	AFS	FAX	120/576
4.2280	CBV	Valparaiso Radio	CHL	FAX	120/576
4.2680	CKN	CF Vancouver	CAN	FAX	120/576
4.2710	CFH	CF Halifax	CAN	FAX	120/576
4.2980	NOJ	USCG Kodiak	ALS	FAX	120/576
4.3070	GYA				

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(or easy to remember number:- "07000 HAYDON")



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Showroom now quadrupled in size.
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UBC-9000XLT
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Comments from John Griffiths

I have to say that I'm not a fan of indoor antennas like this as earlier desk mounted antennas tended to look like

a mad scientist invention. However, I was surprised by the quality of construction of this piece of equipment and it appears to be up to the job it is designed to do. Without getting technical, the Apollo 2000 claims to be able to cover 0-1650MHz. I used it between 108-400MHz: approx and was surprised by what it was able to do. It produced clean copy and there was good reproduction with very little breakthrough.

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Comments from John Griffiths

Putting the DC-2000 up gave me a tremendous boost to all signals with the ancient AR-2000 coming alive! Signals were well received and I found that I wandered out of airband - my usual haunt - into all manner of areas that previously have been less than good here due to my location!

Q-TEK HYPER SCAN

Receive 25-2000MHz. A high performance wideband antenna with PL-259 fitting. Complete with mounting brackets.

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Allows the connection of any HF antenna to any scanner that has a BNC connector. Simply connect the long wire antenna to the push terminal on the top of the interface and attach to your scanner in place of your existing antenna.

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Comments from John Griffiths

I mounted this on my AR-2000 and was well pleased with the results on HF. Verdict? A clear winner and well worth the reasonable outlay.

SCANMASTER SP-55

Boost reception of your scanner with this pre-amp. 25-1500MHz, variable gain, band pass filters.

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NEW Q-TEK HF MINITUNE

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Comments from John Griffiths

Results were able to be looked at in terms of a cheap, low cost ATU and I can report that it is certainly good! At under £50, it must be the cheapest on the market and would suit an enthusiast looking at putting an ATU on a capable scanner.

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

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SCANNING ACCESSORIES

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For HF:- this unit utilises 6 independent HF "inductively" shortened verticals and has a separate wire connection for using the internal MLB (Magnetic Balun).

For VHF/UHF:- that's a semi-secret, although a clever mixture of fan dipole arrays and inductively fed elements help maximise its performance:- It's the most compact all round aerial that works very well!

Ideal indoor or out.

£99.95 + £6 P&P.

Comments from John Griffiths

In rounding up, the intruder performed better than I expected and with little fuss in mounting and connecting up. It appears rugged enough to live out of doors and will also fit nicely on the wall - perhaps an outside wall being the ideal though I have to admit having no problems with my inside one. I found it a pleasing addition to my set-up - with cable correctly mounted and run - it should look professional and very much a part of the kit in the shack. I would suggest that this is the antenna many of us have long been looking for and therefore have no hesitation at all in saying it is definitely the business.



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Deluxe SW ATU 0-30MHz. SO239 fittings.

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10MHz-1.4GHz with bargraph & "Reaction Tune".

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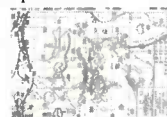
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Decode

Joerg Klingenfuss has just sent me the brand new sixteenth edition of his *Radio Data Code Manual*, this excellent reference manual for data enthusiasts includes some major changes that have taken the page count from the present 600 up to a whopping 784 pages for the new edition, so I was keen to see what caused the changes.

For those of you who never encountered this book, let's start with a look at what it covers and why it's so useful. The book actually started life as two separate publications the first was called the *Air and Meteo Code Manual* and was a comprehensive reference on the various message coding systems used in aeronautical and meteorological transmissions. This coding systems fall into the family known as off-line coding because the coding is carried-out before the message gets to the radio system.

The second book was the *Radioteletype Code Manual*. This was a comprehensive reference containing technical details of the various transmission systems that can be heard around the bands. Here the coding is on-line which means that the coding system is an integral part of the radio link.

Anyway, enough of the technicalities. As both of these books dealt with codes and transmission systems, it made sense to bring them together in one reference publication - hence the *Radio Data Code Manual*. Let's take a look at why you might want a publication such as this.

To understand this you need to appreciate what it is that attracts listeners to the more complex transmission mode. After all, there are very few messages that can be resolved.

In my experience, the common factor is the thrill of the hunt! A bit grand perhaps but what I really mean is that most enthusiasts enjoy the detective process of identifying a station and its transmission type rather than deciphering the message itself. This is a good job really because the traffic on most of the more sophisticated modes is encrypted anyway!

In order to make a reasonable shot at identifying a new station you need access to some form of reference data so that you can compare the characteristics of the new station with other known signal types. This is where the *Radio Data Code Manual* really comes into its own as

error rates and protection systems.

There is also a very handy baud rate look-up system. This is a simple cross reference where you look-up the baud rate of the signal you're tracing and you can then see the range of modes that commonly use that baud rate. Whilst in some cases there may be six modes that use that speed some are very specific, a good example being 125 baud synchronous. If you come across one of these it will almost certainly be a DUP-ARQ signal.

This introductory section concludes with a useful review of some of the current decoding systems with lots of screen shots of an assortment of data modes received using Wavecom's impressive W41PC decoder card.

Moving on to the mode descriptions, each topic starts with an excellent introduction that provides an overview of the mode's characteristics. This is then followed by a detailed description of how the mode operates including all the vital timing detail. This is exactly what you need to help identify new signals.

To make this potentially very heavy material as user friendly as possible the technical descriptions are supplemented by timing charts and screen shots. In addition to the detailed mode descriptions, the Manual includes a comprehensive analysis of the various alphabets that are used in teleprinter and Morse systems. These alphabets are really just look-up tables that convert a conventional text character into one of the codes that are accepted by the mode in question.

The simplest example I can think of is in Morse code. Whereas 'dot-dash' is normally used for the letter A, if you were communicating in Cyrillic, Greek, Hebrew or Japanese the translation would have to be different. It is because of this that you will occasionally need this reference data.

This same problem exists in teleprinter or computer based communication links. One of the better solutions comes in the form of the Unicode system. This has been developed to meet the huge demand for international information exchange.

The system is very comprehensive and includes support for the full range of Asian languages. Moving back to the early sections of the manual you will find very comprehensive details of most of the off-line coding systems that are used extensively for meteorological and Aircraft communications.

The Met section is particularly comprehensive with details of the World Meteorological Organisation and its comprehensive communications network. This is followed by detailed breakdowns of the various codes and message systems.

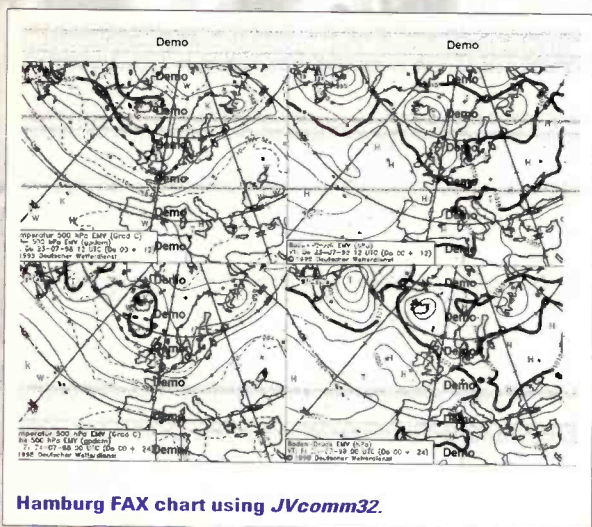
The Aeronautical section follows similar lines with lots of useful information. Overall, the *Radio Data Code Manual* is an excellent reference source of hard-to-find technical data on the data modes - every serious listener should have a copy. Copies are available from the SWM Book Store price £30.00.

New JV FAX!

Yes, at long last Eberhard has developed a Windows version of his famous JV FAX decoding program. The new program is still in development phase and the example tested here was at version 0.95.

The name has changed to *JVcomm32* to better describe its role as a true 32 bit application designed to run in Windows '95 or later. Let's start with a quick look at what you need to run the program.

First of all you need a PC with at least a 486DX66 processor and 16Mb of RAM. You will also need a high or true colour graphics system with at least 800 x 600 video resolution. The operating system needs to be



Hamburg FAX chart using JVcomm32.

it's packed with technical data on a very wide range of data modes.

Rather than just comprising the pure technical data, the Manual includes a good introduction to the technicalities with some very clear explanations on the characteristics of different groups of signals. These explanations include short wave propagation,

Bits, Bauds & Bandwidth

Phil Cadman G4JCP clarifies some complicated areas of data communications by illustrating the differences between 'bit rate' and 'baud' with the toss of a coin.

I was prompted to write this feature by the apparent confusion between the terms 'bits per second' and 'baud rate'. However, rather than simply defining the two terms, I thought a more in-depth look at data transmission may be useful.

The Bit

Let's clear one thing up straight away, the bit, short for binary digit, is actually a measure of information. For example, a message telling of the outcome of a flipping of a coin has an information content of one bit.

This is for two reasons: either the message will always be just one of two possibilities - either heads or tails; or there is an equal probability of a heads or tails result. (Unless, of course, you have a dodgy coin).

That last remark is not as flippant as it sounds. In order for the message's information content to equal exactly one bit, a heads result must be equally as probable as a tails result. Put another way, if a message tells of one of two, equally probable, events the information content of that message is equal to one bit.

A formula exists for determining the information content of a message which tells of events that have more than two possible outcomes and when the probabilities of each outcome are not the same. The example above is simply a special case of the general situation.

Binary digits are usually denoted by the numbers '1' and '0'. '1' is usually regarded as 'true' and '0' as 'false'. To communicate the result of one throw of a coin we can ask the question "was it heads?". If the answer is 'yes', then that answer can be represented by the symbol '1', meaning true. An answer of 'no' can be represented by a '0', meaning false. This also demonstrates one other vitally important thing about encoding: both sender and recipient have to agree on the meaning of each symbol beforehand.

Imagine the coin is flipped ten times per second. In order to communicate the results, a channel that can pass information (data) at a rate of ten bits per second is required.

Baud Rate

Before defining baud rate, let's look at the characteristics of a real channel. By channel, I mean a telephone line, a radio link, a fibre optic link, even two empty baked bean cans connected by a piece of string. Any channel over which information can flow.

In order for the symbols '1' and '0' (representing heads or tails) to be passed over a real channel they also have to be represented by a physical quantity. That quantity may be voltage, current, tones of different frequencies, for instance. I'll choose a voltage of +12V to represent a '1' and a voltage of 0V to represent a '0'.

To communicate ten throws per second these symbols have to be sent at a rate of ten per second, as shown in **Fig. 1**. If, by chance, alternate throws give an alternating heads-tails-heads-tails pattern, then the voltage will change ten times per second. In fact, it will look just like a square-wave, as the last few throws in **Fig. 1** demonstrate.

Now is the time to tell you that baud rate is simply the number of symbols communicated per second. In this example, ten symbols are sent every second. That makes the symbol rate equal to ten baud. We don't say ten bauds per second because the term baud already includes the 'per second' qualification.

Because each symbol represents one bit (a binary signal) the data rate is also equal to ten bits per second. This point is most important - it is only over a binary channel that the baud rate is numerically equal to the bit rate.

Bandwidth & Baud Rate

Take a rather idealised telephone channel as an example. It possesses two very important parameters: its bandwidth (b.w.) and its signal to noise ratio (s.n.r.).

This telephone channel will easily pass symbols at a rate of 10 baud and the far-end voltage waveform will look very sharp, as in **Fig. 1**. Telephone-types please note, I'm assuming, for arguments sake, that the frequency response of this telephone connection extends down to d.c.

If the symbol rate is increased sufficiently then the time taken for the voltage to change from one level to another will become significant compared with the symbol time. The reason the voltage cannot change instantaneously is because the channel has a finite bandwidth.

Things could get mathematical now but instead, imagine sending the symbols at 6000 baud. At the transmitter, the signal will look all nice and sharp, as in **Fig. 2a**. All that's changed from **Fig. 1** is the symbol time - from 1/10th of a second down to 1/6000th of a second.

In the worse case, 6000 baud can give rise to 6000 changes in voltage per second. That's equivalent to a frequency of half that, 3000 cycles per second or 3000Hz.

Assuming the telephone channel has a bandwidth of 3000Hz, the signal will look rather like that shown in **Fig. 2b**

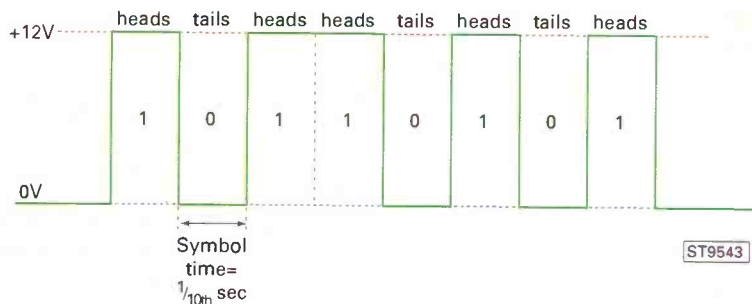


Fig. 1: Our coin throwing waveform, at 10 baud.

once it has passed over the channel. It now resembles a 3000Hz sine-wave. That's understandable because the telephone channel is going to behave like a 3000Hz low-pass filter.

If you are familiar with Fourier analysis then you'll know that a 3000Hz square-wave consists of a 3000Hz sine-wave plus a series of odd-order harmonics. If passed through a 3000Hz low-pass filter all the harmonics will be filtered off leaving just the fundamental sine-wave.

If the symbol rate is increased beyond 6000 baud then the channel will begin to attenuate the fundamental signal as well as all the harmonics. Depending on the rate of attenuation beyond 3000Hz, the signal will eventually be attenuated so much so that the symbols will be detected incorrectly.

Varying a voltage to represent the symbols '0' and '1' is called amplitude shift keying (a.s.k.). I could have chosen to vary the frequency of a tone. That's called frequency shift keying (f.s.k.). Finally, there's phase shift keying (p.s.k.) when it's the phase of a tone which represents the symbols.

For example, using f.s.k., a tone of 1200Hz could represent a '0' and a tone of 2400Hz could represent a '1'. Even so, the theoretical maximum symbol rate would still be 6000 baud - twice the channel bandwidth.

Multi-level Signalling

If the symbol rate over a telephone channel is limited to the relatively low figure of 6000 baud, how do modems manage 28800 bits per second and above? The answer to that is for each symbol to have more than two possibilities. I'll use the coin throwing analogy to illustrate the point.

Instead of asking just one question - is it heads? - the results of two successive throws are used to answer a multi-part question. The table in Fig. 3 shows all the possible results of two consecutive throws. Each individual throw still gives a 0 or 1 result but this time four symbols, the letters a, b, c and d, represent the four possible outcomes of any pair of throws.

Each symbol now represents two bits of information. If a varying voltage is again used to represent these new symbols then four voltage levels, as shown in Fig. 4, are needed.

Fig. 4 also shows how voltage transitions only occur, at most, every two throws. Keeping the symbol rate at 6000 baud the results of 12000 throws, or bits per second, can now be communicated.

Just as in the binary case, different tones could be used to represent the four symbols. For example,
symbol a - 600Hz
symbol b - 1200Hz
symbol c - 1800Hz
symbol d - 2400Hz

Here, twice as many bits per second could be communicated in the same bandwidth.

Going one step further, we could send the results of three consecutive throws at a time. If so, eight symbols will be needed to represent the outcome of the three throws. The combinations are shown in the table in Fig. 5. The data rate is now up to 18000 bits per second whilst the symbol rate is still 6000 baud.

You should have guessed by now that the data rate is equal to the number of bits of information that are encoded into each symbol multiplied by the number of symbols communicated every second. In this last case three throws are encoded into each symbol - three bits per symbol - and the symbol rate is 6000 baud. Multiplying 3 by 6000 gives 18000 bits per second. Encoding four throws (four bits) per symbol (needing 16 different symbols) would give a data rate of 24000 bits per second and so on.

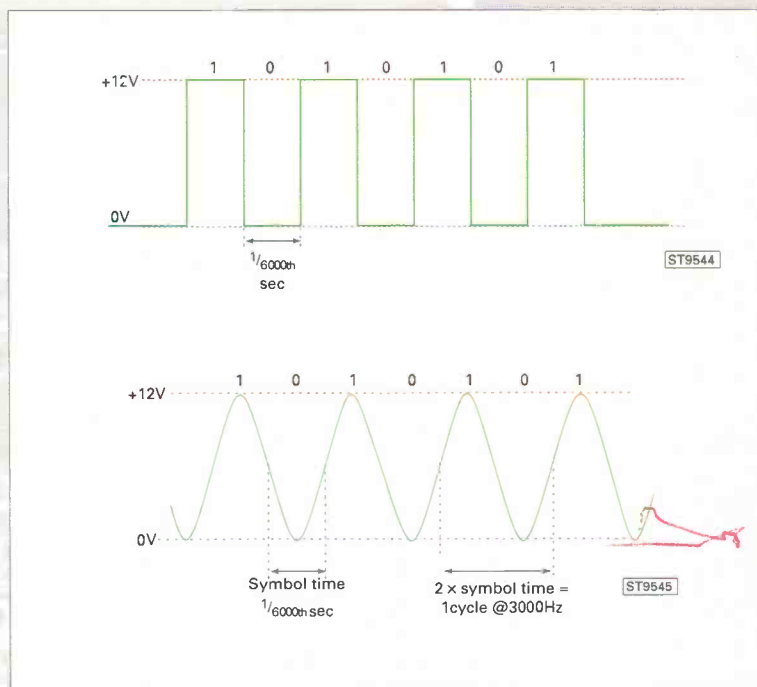


Fig. 2:
a) Now we've speeded up to 6000 baud.

b) The 'real-world' signal via a 'phone line.'

Signal To Noise Ratio

If all this seems too good to be true then you'd be right. In the table in Fig. 5, the last column shows the voltage levels that could be used to represent each of the eight symbols. Compare those eight voltages with just the two required to communicate the result of one throw at a time.

In the latter case only a simple comparator is required to differentiate between a '0' and a '1'. Just set the comparator to compare the input voltage to a fixed +6V reference. If the voltage is lower than +6V then take it as a '0' (0V) and if it's above +6V then take it as a '1' (+12V). Even if the channel were noisy it would take a noise spike of 6V or more to move the 0V level up above +6V or the +12V level down below +6V.

When there are eight voltage levels, seven comparators

Second Throw	First Throw	Binary Representation	Symbol	Voltage (v)
tails	tails	00	a	0
tails	heads	01	b	+4
heads	tails	10	c	+8
heads	heads	11	d	+12

Fig. 3: Encoding to improve the amount of data that can be transmitted in the same bandwidth.

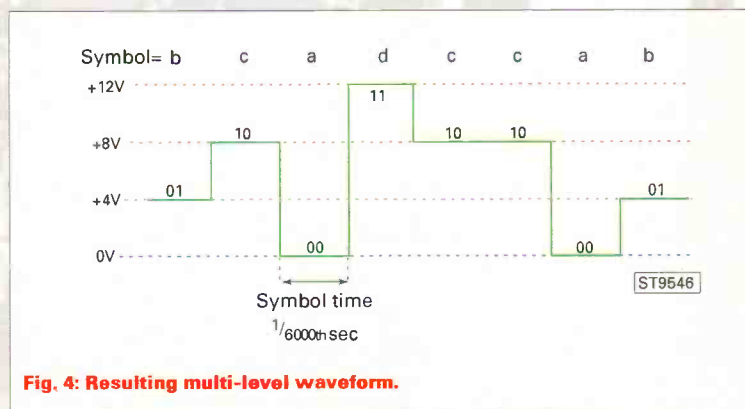


Fig. 4: Resulting multi-level waveform.

Third Throw	Second Throw	First Throw	Binary Representation	Symbol	Voltage (V)
tails	tails	tails	000	a	0
tails	tails	heads	001	b	+1.71
tails	heads	tails	010	c	+3.43
tails	heads	heads	011	d	+5.14
heads	tails	tails	100	e	+6.86
heads	tails	heads	101	f	+8.57
heads	heads	tails	110	g	+10.29
heads	heads	heads	111	h	+12

ST9548

Fig. 5:
Higher level
of encoding,
3-level.

are needed (and a bit of logic) to identify the transmitted voltage level. Actually, the number of comparators and the associated logic is no great hardship. The real problem is the small difference in voltage levels. It now only requires a noise spike of about 0.85V (half the step size) to cause an error. That's only a seventh of the 6V required to produce an error in the binary case.

While the data rate has gone up by a factor of three the noise immunity has gone down by a factor of seven. This loss of noise immunity happens regardless of how the symbols are physically encoded; voltage, frequency, phase or whatever. The more levels a multi-level system uses then the higher the channel's signal to noise ratio has to be for (essentially) error-free communication.

Hybrid Systems

Rather than varying just one physical quantity in order to represent the symbols in a multi-level system there

is nothing to stop there being two (or more) varying quantities. For example, instead of having eight voltage levels, I could pick a series of four tones, each of which could have two voltage levels. This is an extension of the 4-level f.s.k. case above. The combinations could be as shown in Fig. 6.

Symbol.	Freq. (Hz).	Amplitude (V).
a	600	12
b	1200	12
c	1800	12
d	2400	12
e	600	6
f	1200	6
g	1800	6
h	2400	6

Fig. 6: A 4-level example.

Of course, the receiver is more complicated because this time it has to detect both the frequency and the amplitude of each tone.

Real Modems

I've used simple examples, yet similar methods involving frequency shift keying were commonly used until very recently. Indeed, 1200 bits per second over a telephone line was considered fast just a few years ago. Since then, most telephone exchanges have been upgraded to fully digital operation so giving better, more consistent, connections. The incorporation of inexpensive digital signal processing (d.s.p.) within the modems have done the rest.

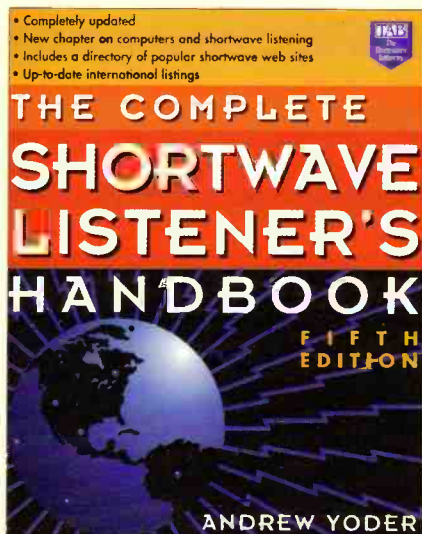
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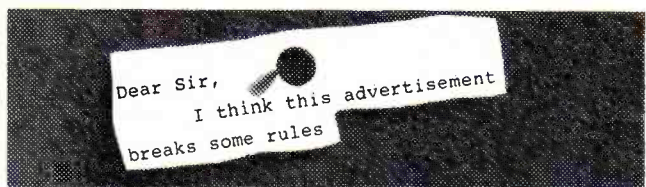
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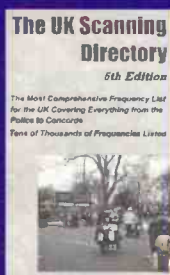
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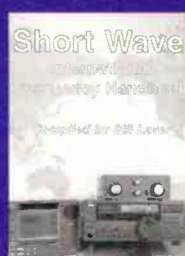
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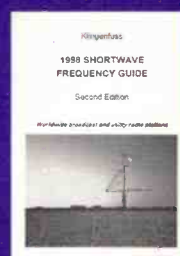
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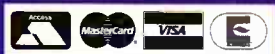


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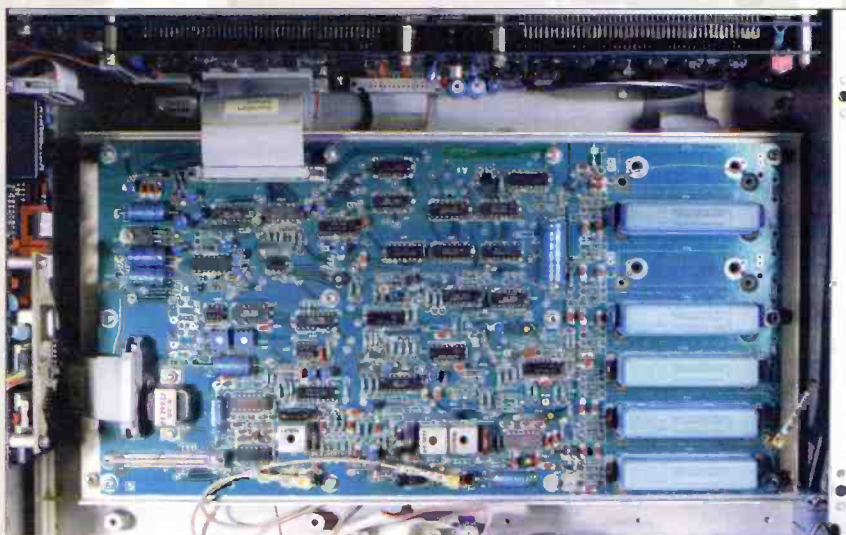
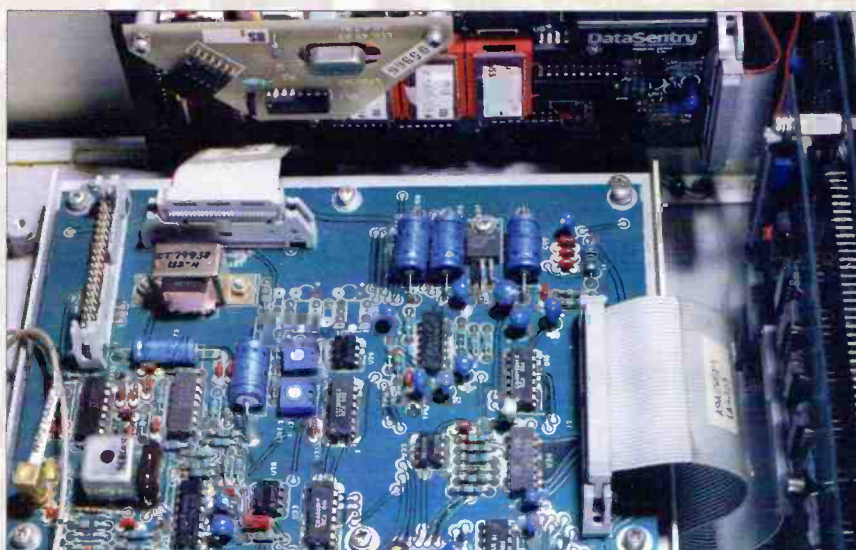
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the mode parameters, a board mounted d.i.l. switch S1a located on the front panel memory board must be temporarily set to the CLOSED position. If this switch is permanently left in the CLOSED position, then the pre-set mode parameter facility is inhibited.'

All well and good, but in order to find S1a you have to remove the receiver from its cabinet or rack mount, take off the top cover, find the DIL switch which is not one switch but a bank of three, and then discover by casting the runes that you do not move one of the three switches but two - and which two? after which you can set the mode parameters to your choice and reset the switches, restore the top cover to the receiver, the receiver to its cabinet, and resume listening.

No it's not ideal, but this is after all a professional receiver and I'm testing it in a hobby environment.

Perfect Filters

I imagine that the RA1792 can appear with different i.f. filtering depending on its original application, but the sample I had contained what for me was a perfect set of filters, 300Hz, 1kHz, 3kHz, 6kHz and 16kHz. When I had the lid off locating the mysterious S1a I noticed with approval that the i.f. filters were all top specification Collins mechanical types, so it did not surprise me to find that the receiver performed

superbly under real listening conditions.

Do I prefer this traditional approach to Digital Signal Processing (DSP)? You bet your life I do, the receiver was a joy to listen to whatever the mode and whatever the band conditions, and the recovered audio was smooth and sweet in all modes, helped by the excellent a.g.c. system which is a proper 'hang' type where the a.g.c. 'hangs' to the end of a predetermined period before restoring full receiver gain.

For listening to nets on 80m or air traffic on s.s.b. the long time constant is perfect because it effectively removes the background noise between transmissions, whilst the intermediate and short time constants fit well with other modes. Single sideband also sounds excellent because the u.s.b. and l.s.b. filters are fitted as a matched pair, as is common practice in this class of receiver, and the filter shapes are not symmetrical, falling from -6dB to -60dB in 650Hz on the carrier side of the filters but falling in 1.1kHz on the other slope of the passband.

This has the effect of improving rejection of residual incoming carrier and better low frequency audio recovery, and is largely a requirement brought about by the need for professional receivers to operate in ISB (independent sideband) mode in which the upper and lower sidebands of a common suppressed or reduced carrier are actually carrying different audio information.

The presence of these filters in the RA1792 make ECSS listening to a.m. signals very pleasant indeed because of the better low frequency response obtained and the fact that switching between sidebands on the same signal is perfectly balanced. If you happen to have the optional ISB unit fitted then the situation is even better, but I didn't have this so can't comment further.

Bandwidth selection is available at the touch of a key on the keypad, and in s.s.b. modes you have an i.f. shift facility which works well but sadly not in other modes. Now to r.f. performance. I approached the RA1792 with some awe because of its renowned superiority, and soon realised that this was a remarkable performer. Figures are as follows, and I have normalised the intermodulation measurements for direct comparison with all my previous reviews.

Sensitivity measurements were taken at 14.200MHz, and 3rd order intermodulation measured at 20kHz signal spacing 14.038MHz and 14.058MHz. FM sensitivity was measured with 3kHz deviation at 1kHz modulation

frequency whilst a.m. sensitivity was measured with 60% modulation at 1kHz.

Sensitivity Measurements

See tables (right).

Third order intercept point was +37dBm after normalisation, and 2nd order intercept point using my standard frequencies of 6.5MHz and 7MHz, resolving the intermodulation product at 13.5MHz was +74dBm.

Phase noise performance measured using a wanted signal giving 12dB SINAD and introducing an unwanted signal at a level which degraded the wanted by 3dB. 3kHz bandwidth in u.s.b. mode.

What does all this jargon tell you? It shows that the RA1792 is a terrific h.f. performer, as one would expect considering its pedigree. The 3rd order intercept is way above anything on the current hobby market, with only the AOR AR7030 coming close, whilst the 2nd order intercept shows the effects of a non preselection front-end, but with a modest tuned preselector ahead of it the RA1792 would be very good indeed.

The reciprocal mixing performance which shows the cleanliness of the synthesiser was bettered by the dear old R-820, but the R-820 benefited from being a limited coverage receiver with a PLL for each band, whereas the RA1792 is a wide range general coverage design, so no black marks need be given.

Monkey Chatter

What about the 'monkey chatter'? I obviously had to take a listen to the BBC on 909kHz and compare audible results with those obtained using other receivers, and my feeling is that the conventional filtering of the RA1792 produces cleaner audio with less of the off-carrier chatter, but it isn't outstandingly different.

Two things spring to mind, firstly that the ultimate stop band rejection of the mechanical filter is probably better than that of a d.s.p. system - look at typical d.s.p. responses in works such as Ulrich Rohde's book on receiver design.

Secondly, and this may explain why the RA1792 didn't seem overwhelmingly better, all JRC receivers pre NRD-545 used a homodyne type of a.m. detector in which the incoming a.m. signal was passed through a limiting amplifier to effectively strip off the modulation component and the resultant carrier then used in an s.s.b. detector to demodulate the non-limited a.m. signal.

Because the 'carrier' used in the demodulator is the actual incoming carrier, no heterodyne beats are produced, so most operators never realise that an s.s.b. demodulator is being used. It was interesting to find that Racal have used a homodyne detector in the RA1792, and if by chance the JRC a.m. decoding algorithm in the NRD-545 is intended to reproduce the effect of a homodyne detector so as to maintain JRC previous practice, could it be that the common denominator in all this 'monkey chatter' is the use of a homodyne?

A further thought (and I'm simply thinking aloud) is that I don't know how a homodyne detector behaves when a) the receiver is off-tuned from the carrier, and b) the depth of amplitude modulation is as high as that produced by the 'Optimod' type of processor used in broadcast transmissions, bearing in mind that Optimod can achieve greater than 100% modulation on positive modulation peaks. Please discuss, and have your reports on my desk by next month!

Satisfying To Use

But back to the RA1792. What more can I say? This is a receiver which is incredibly satisfying to use, even

though some of the operational facilities are clearly designed for professional, probably unattended use, and yet it performs with such easy grace that it is a delight.

At its original price on the market it was good value for money, but with its current price at around £1000 it is a bargain. And yet - there has to be a caveat.

There are specimens of the RA1792 around which are not all that they seem, and it is good advice to check very carefully before parting with money to ensure that all the necessary filters are fitted, that the i.c.d. display units are working on all segments, and that the receiver is in every way complete and original.

Many years ago RCA produced a receiver designated the AR-8516L, and in the middle of production something happened which resulted in the receivers being sold out on to the disposal market. If you managed to get hold of a complete example you had a good receiver, but oh dear, there were many incomplete units around which were cobbled together into 'working order' by unskilled technicians, and these were simply awful. Similarly, a release of Collins R-390s on to the surplus market resulted in many stories of heartbreak when it was discovered by unfortunate owners that the i.f. strips had been 'decommissioned' by the US Government by driving sharp instruments into the i.f. sections and wrecking the unobtainable i.f. transformers.

Fault Indicator

Earlier on I mentioned the 'fault' indicator and remarked that it was a good thing it never appeared during my brief operating sessions. Assuming that you are fortunate enough to obtain a working sample of a receiver like the RA1792, you must seriously consider what you will do should it go faulty and require service or spare parts.

If, like me, you are skilled and experienced enough to carry out repairs to a reasonable standard, fine, otherwise be careful. When you enter the world of professional service and spares you are potentially stepping into a very expensive environment, and you must be prepared for some lip-licking prices.

The silver lining to the cloud is that receivers in this category are designed to work without failure for a very long time, but they are coming up for 20 years old, so don't say I didn't warn you.

The bottom line is this: I want an RA1792 for myself, but the owner of this immaculate specimen won't sell it to me. What's even worse is that he also owns the receiver which will be the subject of a future review which promises to be even more impressive - and he won't dispose of that one either. Mind you, I could always refuse to let them go...

Anyone want an immaculate Collins 515-1?

Happy listening!

Sensitivity Measurements

Mode	dBm for 12dB SINAD	Filter Bandwidth (Hz)
SSB	-123	3000
AM	-114	6000
	-117	3000
CW	-126	1000
	-132	300
FM	-120	6000
	-118	16000

Phase Noise Performance

Spacing from wanted signal		Reciprocal mixing ratio dBc/Hz
(kHz)	(dB)	
+5	70	104
+10	84	118
+20	95	129
+50	103	137
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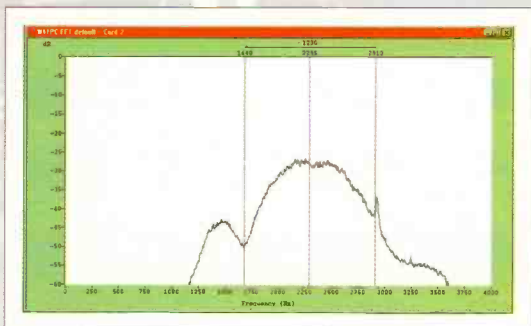
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Wavecom W41PC Review

Dave Gentile has been a W41PC owner for the past three months. Here he shares his thoughts on the decoder.

Fig. 1: A Russian QPSK on 7832.08kHz. Notice the 'smooth' spectral appearance, this is the result of a 'randomiser' being added to the bit stream.



The W41PC is an Analogue-to-Digital (A/D) converter that will allow users to decode a majority of the signals currently found in the h.f./v.h.f./u.h.f. spectrum (mostly h.f., and all non-encrypted).

How Does It Work?

The W41PC has three inputs: a.f., h.f. and i.f. (all BNC). The a.f. (Audio Frequency) input takes the 4kHz output from a receiver's phono or DB-9 "mini" jack. The h.f. (High Frequency) input takes the 455kHz output from a receiver. This output is only available on certain receiver models.

The i.f. (Intermediate Frequency) input takes the 10.7MHz output from a receiver. This output is only available on certain receiver models (normally v.h.f./u.h.f. receivers and scanners).

Whatever the input, the incoming signal is "sampled" at 48kHz, which allows for a maximum Fast Fourier Transformation (FFT) bandwidth of 24kHz without signal degradation. This sampling process takes the analogue signal and turns it into a digital (1 or 0) signal. Wavecom engineers state that the decoder can sample at a rate of 96kHz, but that rate has not yet been implemented in the software.

The now digital signal (constantly being sampled from the analogue input) is scanned for purposes of analysis and decoding.

First Impressions

When I first looked at the decoder board, I was quite impressed with it. A very professional looking product indeed. I was equally impressed with the user manual. It was very well organised and packed with tons of useful information (each signal had at least a page dedicated to it).

I quickly installed the board and powered up my 200MHz Pentium PRO4. I inserted BNC to RCA type plugs onto the three W41PC inputs and hooked the appropriate cables to my h.f. (Kenwood R-5000) and v.h.f./u.h.f. (Icom IC-R7000) receivers. I then started installing the software (from two 3.5in 1.44Mb disks).

The software is Win-95 Graphical User Interface (GUI) based and installed using the standard installation 'wizard'. The installation instructions in the user manual were spot-on and I had absolutely no problems with setting up the W41PC card.

After you have successfully installed the software, the interface is "downloaded" (this takes about 15 seconds). I was now looking at the main operation screen of the W41PC software. The interface is uncluttered and very

easy to understand if you are already used to using Win-95.

I first had to select a valid W41PC card before I could actually begin doing anything. This was easily done and I was now ready to go.

The first thing I did was check each of the three inputs (a.f./h.f./i.f.) to ensure that they were working properly. I powered up my R-5000 and tuned up a signal. I then started the 'FFT mode' (this was done by simply clicking the FFT button). I clicked the demodulator button (a sub-function of the FFT Mode) and chose 'AF'. I was greeted by a 4kHz wide screen that displayed the incoming signal.

I was able to quickly get the idea of what functions were available to me, and I chose an average of '20' to slow down the FFT display. This allowed me to clearly see the frequency components of the signal. I will go into further detail of the FFT screen later.

I next went to the 'Signal Analysis mode'. This mode actually does three things:

1) It shows the detected baudrate of the signal (note: when using this function on asynchronous teleprinter systems with 7.5 bits, the actual baudrate will be one-half of the indicated baudrate). This function is similar to the Code-3/30's shift-speed measurement module. You can select an 'average' or 'peak' display and you can zoom 1000 or 500 baud (for precision measurements).

2) It displays a 4kHz spectrum (basically the FFT mode again, but now the signal is sampled for several seconds providing for a 'snapshot' of the signal's frequency components). You can select an 'average' or 'peak' display and you can also zoom in 1000Hz and 500Hz (for precision measurements).

3) Alongside the baudrate and spectrum displays, are 'waterfall' displays. These are zoomed when you zoom the adjacent baudrate/spectral display. You can also select several colour schemes (like 'HOT', 'COLD', 'COPPER' and 'RGB').

I was initially impressed with these two analysis modes.

Lastly, I went to the "Code analysis" screen. This mode takes the parameters that were determined in previous modes and performs a correlation bit analysis against it (basically it checks the cycle length of the signal against a table set into the software - it then selects the most likely candidates).

Again, asynchronous systems threw this mode off, you must know to choose the correct baudspeed. It is with this mode that I have a few complaints:

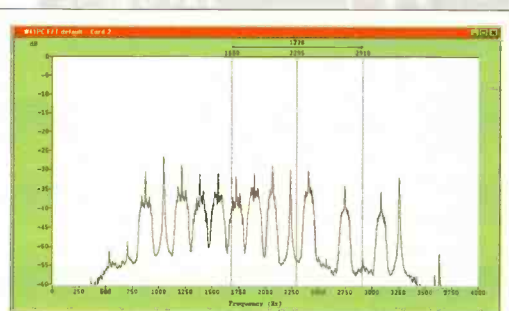


Fig. 2: Here is a nice shot of a multi-channel VFT system. You can easily see the number of channels present.

1) If you find a new signal, you **cannot** find out what the cycle length is because no such analysis function is built into the software (at least not yet).

2) The code analysis function only works with about 90% of the h.f. modes that the W41PC can decode and none of the v.h.f./u.h.f. systems.

Because the signal I was monitoring was asynchronous, I had to manually select the 'baudot' module (if you change the baudspeed to its asynchronous rate, then the W41PC will 'figure out' that the signal is indeed RTTY). This brought up the actual decoding screen (if the W41PC determines the mode, then it will automatically jump to the proper decode module).

Assuming you follow the steps I outlined above, (FFT mode, Signal Analysis mode, Code Analysis mode) you should not have any problems with decoding the monitored signal (all the optimum decoding parameters are auto-selected by the W41PC). If you jump directly to the decode screen, by-passing the FFT and signal/code analysis modules, then you must manually set all of the various demodulator options (shift/centre/demod, etc.).

I would like to point out **one very big advantage** to the W41PC's decode modules - a **Timestamp** feature! This is very well implemented, and really gives the user unprecedented analysis opportunities. Just make sure your system time is correct. Otherwise that guy who you thought started sending at 12:00:00pm might be stamped 06:15:17!

I now began testing the h.f. and i.f. inputs. Although I do not have a 455kHz output on any of my receivers, I was able to take my R-5000's a.f. output into the W41PC's h.f. input.

I saw a display similar to the a.f. display, but it was weaker and did not properly drive the board. I would recommend that you do not use the h.f. input unless your receiver specifically outputs at 455kHz.

On testing the i.f. input, I had quite a bit of a problem! Although my Icom IC-R7000 had a 10.7MHz output, it hardly drove the card at all! Luckily I was able to find another user who gave me some instructions that allowed me to cut the 12V wire that was being fed to the 10.7MHz output. (Thanks Fabrizio!). This modification allowed me to use my R-7000 with the W41PC card well enough to get the modes associated with the i.f. input to work.

Simply put, my first impression was a good one.

1) Nyquist rule - sampling must be at 2x the highest modulated frequency.

2) A higher sampling rate will allow for a larger FFT bandwidth.

3) The board fits into a free 16-bit ISA slot. Depending on your computer's casing, you may have to make some adjustment to get the BNC outputs to fit comfortably against the frame. I actually had to 'cut' the back of my casing so I had a snug fit. Others filled down their casing.

4) Note: A 100MHz (or higher) Pentium processor is the suggested minimum processor for using a W41PC card.

5) The software is capable of controlling up to 8 W41PC cards (it is strongly suggested that if you actually have more than four cards installed, that you use *Windows NT 4.0* as your operating system).

6) Only works on h.f./f.s.k. based systems. On v.h.f./u.h.f. systems you have to guess what system is being used.

7) The 12V voltage on the i.f. output is used to supply power to the external TV adapter. If you don't own it, then you can safely cut this wire without degrading the receiver's performance.

8) Owners of the Icom IC-R7000 will need to build a small general purpose amplifier and connect it to the 10.7MHz output to properly drive the W41PC card.

After several weeks of 'testing' the W41PC, I had a pretty good feel for the software interface. Here are some of my observations.

The FFT Mode

I was originally pretty dismayed with this mode - it appeared that it was simply a 4kHz spectrum without a whole heck of a lot of uses outside of tuning. I was wrong!

One of the first things that you need to do, before you begin logging anything, is to discover your receiver's centre freq. The reason for this is one-fold: you simply will not know if your signal is properly tuned to its true frequency without doing this!

You do not actually have to have your signal tuned at all, because the W41PC **automatically** senses where the signal is, and properly adjusts all of the main parameters for optimum decoding, **but** your signal will be off-tuned.

So what you do is tune up to a known frequency and then move the 'tuning cursors' until they give you the measured centre frequency. This centre frequency is the centre frequency of your receiver's filter.

For example, I tuned up to 252kHz, which is an a.m. station here in the UK, and selected the 'FSK' filter on my receiver. This gave me a nice steady tone (the a.m. carrier) with which I could use to find my FSK filter's centre frequency (each of your receiver's filters must be separately tested to find their centre frequencies).

I adjusted my tuning cursors until they were centred over this tone. When I read the centre frequency it stated 2290Hz. Now when I tune up a signal to 2290Hz in the FFT mode, I know that it is properly tuned to its true frequency.

So what else does the FFT mode do? For VFTs it is a dream come true! You can easily centre the entire signal into the FFT's window. Select the bandwidth you want: 0.5, 1, 4 or 24kHz and tune from there. I selected the 4kHz bandwidth and centred the VFT in the middle of the window.

I set my averaging factor to 60. You can set it anywhere from 1 (the screen is constantly refreshed) to 64 (the screen is refreshed as an average factor of 64). I now selected the type of 'window' I wanted. You can choose 'rectangle', 'hamming', 'hanning' and 'blackman'.

For simplicities sake, I will not go into what each window type actually does (the real tech heads reading this will probably be salivating over this info). I choose the 'rectangle' option. I could now very clearly see the seven active channels and the pilot tone.

Using the tuning cursors, I could easily measure the entire bandwidth of the signal (2.4kHz - accurate to ± 8 Hz in a 4kHz spectrum), the location of the pilot tone (3310Hz), and the number of channels present (7). I now tuned in the first channel and I moved the cursors (using the mouse) so that they were spaced evenly on either side of the channel and then I zoomed to a 500Hz spectrum (you must input the centre frequency of the channel you are interested in before you zoom, otherwise the W41PC zooms to the last input centre frequency).

I could take a very

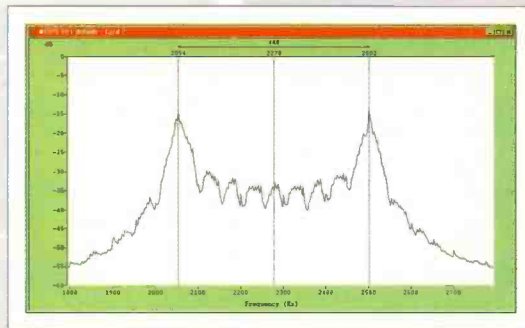


Fig. 3: A close-up of a 50 Baud, 450Hz shift, teleprinter. Measurements of ± 1 Hz can be taken using the Real-Time FFT Analysis module.

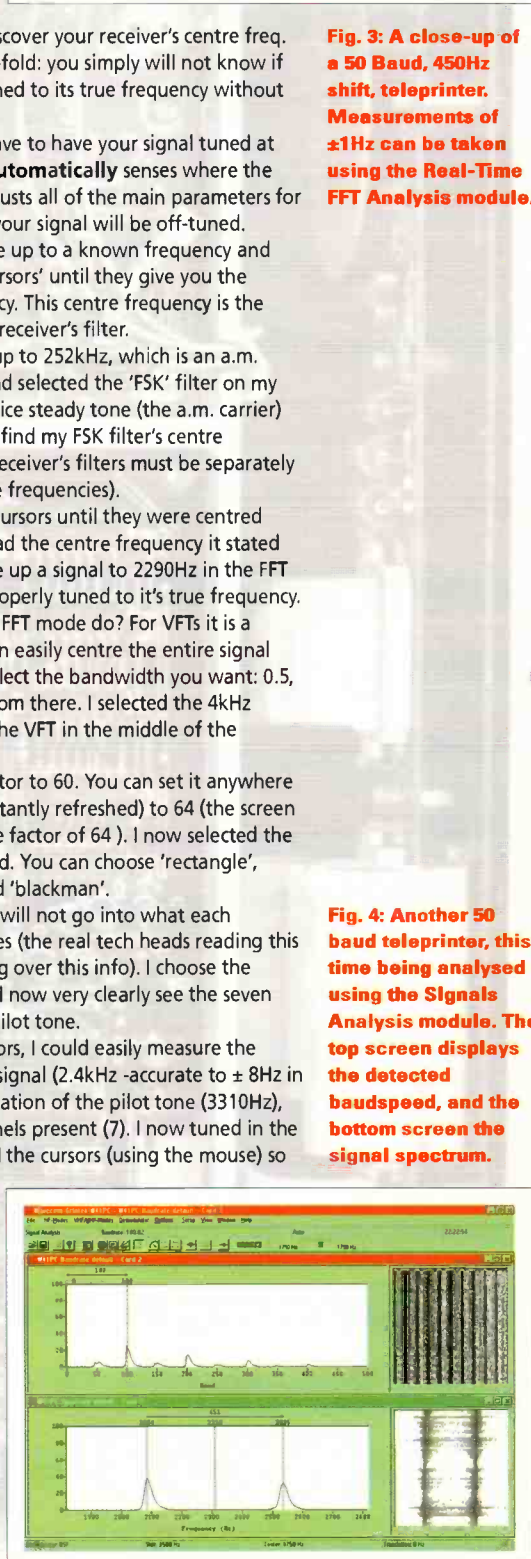


Fig. 4: Another 50 baud teleprinter, this time being analysed using the Signals Analysis module. The top screen displays the detected baudspeed, and the bottom screen the signal spectrum.

In the end, the W41PC is a double edged sword: it is expensive but it has potential. At \$4000 USD it is \$1500 more than a Hoka Code-30 and much much more expensive than anything less. On the other hand, it is relatively inexpensive compared to 'professional grade' products such as the 'ELVIRA' system from Applied Signal Technology (\$10000+ USD).

So what makes a very happy Code-30 user buy a WAVECOM W41PC (besides the fact that I did not need another Code-30)? Potential! The W41PC board is cutting edge technology.

It certainly has the potential to become the successor to the Code-30 within the next two years. That coupled with the capability to control up to 8 W41PC cards in one Win-NT Pentium computer gives users an unprecedented flexibility. The designers at WAVECOM have some really **big** ideas for this, their mainstream flagship product.

The following modes will be added as soon as possible: FELDHHELL, SSTV and BULG-ASCII (this would be cool!!!)

Modes that are being discussed: PACTOR-II, HF-ACARS, ALIS-II, CIS-36, FLEX, FAX G2/G3 (HRPT signal, 2048 pixels/line), CALSEL, CODAN and TETRA.

It is planned to add following analysis tools for the h.f. modes: 3D-Waterfall, Oscilloscope, Autocorrelation, FSK Signal Analysis, MFSK Signal Analysis, Bit Analysis, Bit Analysis F7B, Bit Length and Raw FSK Data.

And following tools for the v.h.f./u.h.f. modes: 3D-Waterfall, Oscilloscope, Autocorrelation, FSK Signal Analysis direct, FSK Signal Analysis indirect, Code Analysis direct, Code Analysis indirect, Bit Analysis and SELCAL Analysis.

Another analysis tool planned: Eye diagram (vector-scope).

Planned Miscellaneous features: Remote control for shoc's RadioManager, Alphabets such as Cyrillic (TASS, ITA-2 3rd Shift), Greek, Arabic, (ATU-80), and Hebrew, The online help is nearly ready, Export option to give customers the ability to edit stored data.

As you can see by this list, WAVECOM has a lot planned for this decoder. Readers of this article should understand that the above bulleted items **are not available** at this time! Some of these are going to be released in a new software build this spring, others may never see the light of day.

I hope this article has been informative, and I would like to hear from readers out there on it's contents.

New items for Version 4.10 of the W41PC software

July saw the first new release of the W41PC software in seven months, here's what is new:

Alarm Monitor

Most hobbyists that have used a decoder have wanted the capability to monitor incoming text for items of interest, be that a string of RY's or a keyword. This capability is now available for the W41PC through the implementation of an 'Alarm Monitor'.

The Alarm Monitor allows you to input up to TEN 'alarm strings' such as 'ZCZC' or 'cq cq cq'. When the string is "seen" in the text of the decode output, an alarm pops-up alerting you to it (along with all text on that line of the output). You can also tell the Alarm Monitor to play a favourite .WAV file whenever the text string alarms.

The alarms, or the entire decode session, can be saved to a text file for later viewing. The Alarm Monitor also works with the Server Control feature, from any other card connected to the 'network' (network being all those cards connected to any computers on your LAN).

Server Control

The Server Control application monitors all W41PC connections to the computer that houses the card(s). This computer is known as 'the server'.

The server manages the W41PC cards, and all connections made to those card(s). The server control application must be started before any W41PC card can be used on the server.

As far as I could tell, this application is intended for use by those individuals that own two or more W41PC cards installed in the same computer (obviously, most amateurs will not have more than one card, so I don't quite understand its inclusion in this software build).

New 'Alphabets'

The following 'alphabets' are now available:

ITA-1 Latin	3rd-Shift Cyrillic
ITA-2 Latin	3rd-Shift Greek
ITA-2 Transparent	Arabic-Baghdad-70
ITA-3 Latin	Arabic-Baghdad-80 (ATU-80)
TASS Cyrillic	Hebrew
ITA-2 Cyrillic	

The last item included with the new software was a standard Win-95 help file for the W41PC hardware/software. This file was quite in-depth, and contained almost all of the information that was contained in the previous version of the hard-copy W41PC manual.

You can visit the Wavecom site at:

<http://www.wavecom.ch/>

You will find tech specs and other W41PC info at their site.

Or, try the Klingenfuss Publications site:

<http://ourworld.compuserve.com/homepages/klingenfuss/wavecom.htm>

Lastly let me say that these observations are strictly **mine!** All of them or none of them may be accurate. The above article is for informational purposes only and if you are seriously considering purchasing the W41PC, you should chat with other users and the folks at WAVECOM for more information. Have a spin and remember to keep your grin!



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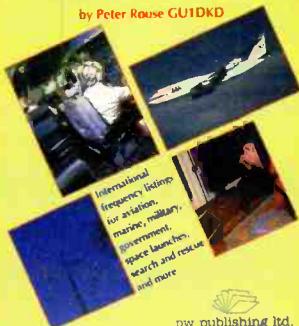
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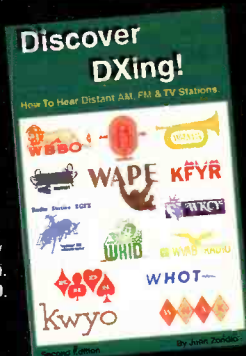
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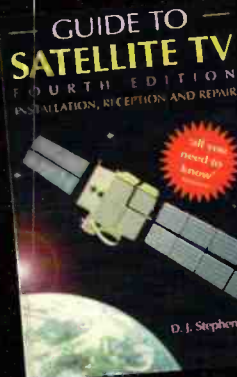
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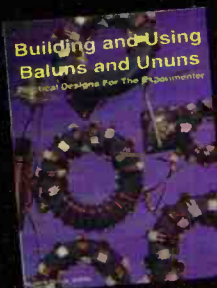


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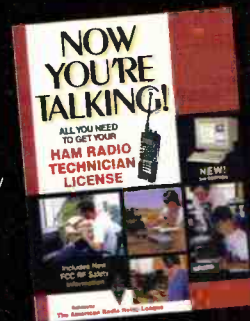
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SSB Utilities

Terry Collins from Merseyside writes with a photocopy of an article from the 1998 *Royal Air Force Yearbook*. The article is titled 'Aeronautical Rescue Co-ordination Centre' (ARCC) and it contains some interesting information regarding UK search and rescue operations and the set-up at the ARCC at RAF Kinloss in Scotland. Terry suggests that it may be of interest to the large number of readers who listen to the RAF, RN and HMCG flights on 5.680MHz.

The article explains how their h.f. radio operation has a separate room with separate operators and how h.f. is considered to be a mysterious science. It also mentions that they are hoping to change to satellite communications in the future, which will allow the ARCC to send text messages to the SAR forces, and to receive near real-time position reports direct from the GPS equipment in the helicopters and other aircraft.

Personally, I think that they will never be able to do away with h.f. completely as there are times when satellite communications are not available. The article contains some impressive photographs of the equipment used on SAR missions and also some photographs of the ARCC office. If search and rescue is your thing, then I would recommend that you get a copy of this magazine from your main newsagent.

DX-394

In recent months there has been a lot of discussion and interest in the Realistic DX-394 h.f. receiver available from Tandy shops in the UK. This is a desk-top receiver with 'proper' connections for coaxial cable and twin-feeder antennas. It also features a proper tuning-knob, covers 150kHz to 30MHz, has a useful 160 memories, and a full digital display. For a more detailed explanation of the DX-394, see p26 of April *SWM*.

What makes the receiver so interesting is its low price of just £99, making it the cheapest desk-top receiver on the market-place by far. A number of people were tempted by this low price, Tandy shops up and down the country appear to have been selling-out quickly and then building up waiting-lists.

There were some thoughts that at such a low price, the receiver might be a bit deaf, or even reduced in price due to a replacement about to be announced. This was certainly not the case, as tests showed that it was at least as sensitive as receivers costing three times as much.

The technical specifications for the receiver state that it tunes in 100Hz steps, but after some serious testing it was found that the tuning step was an amazing 50Hz! Even better than some Sony models which some people considered to be the ultimate in design - at a price - and the benchmark against which other radios in this price bracket are compared.

It came to light that the UK shops had over-stocked on the DX-394, and they needed to sell lots of receivers to get their stock-levels back to a more normal level. Unfortunately, all good things must come to an end. By the time you read these words, the price will have returned to its original price, £199. If you were lucky enough to get one at the cheaper price, then you have an absolute bargain.

As a measure of how successful this receiver has become, there are now a few mods starting to appear on the Internet, and I understand that somebody is producing a web-page devoted to this receiver. All this prompted me to see what I could find on the Internet relating to this receiver.

I found a number of web-pages, but two of them seem to be the most suitable in my opinion:

<http://www.rnw.nl/realradio/dx394.html> contains some

technical specifications and a review of the receiver; http://support.tandy.com/support_electronics/19323.htm is an official Tandy/Realistic page containing lots of technical information: details of how to use the receiver; assembly diagrams; and a series of simple instructions explaining how to get the best from your DX-394.

Letters

Alan Burnett-Provan from the West Midlands writes in response to the frequency questions of Mr Sillifant a few months back. Alan says that he can confirm hearing Bombay ATC - or rather Mumbai ATC, as Bombay was renamed a few years ago - on 5.652MHz operating in the AFI-3 network.

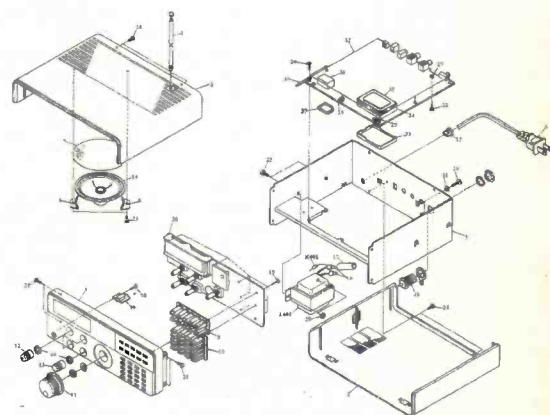
However, since Mr Sillifant reported hearing Bombay on 5.648MHz either the mystery remains, or Mr Sillifant's receiver was off-frequency. The only way to find out for sure is to spend more time listening to this frequency until you hear stations and can positively identify them.

M. Brown from Jarrow points out that Bombay is very active on 5.658MHz, and that it is most unlikely for 5.648MHz to be used for ATC purposes as it is so close to 5.649MHz in the NAT network. Our very own **Godfrey Manning** points out that 5.648MHz is not an aeronautical channel, and that it is probably a mis-print (or even a mis-logging) of 5.658MHz. I must admit that I am inclined to go with Godfrey on this one. I have heard Bombay/Mumbai many times on 5.658MHz, and I could understand if they were to make a brief transmission on the wrong frequency, but I would not expect them to control air traffic while they were off frequency.

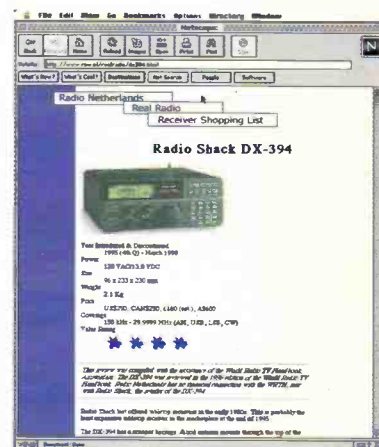
Staying with M. Brown's letter, he says that the JGO callsign heard by **Kevin Wright** is a C-130 Hercules based at RAF Mildenhall. He says that he got his information from *Callsign 98*. Well, all that I can really comment is that I don't believe the book!

I don't want to criticise *Callsign 98* as it is very valuable, but it should not be considered the final word on the subject. *Callsign* books are extremely useful for giving a general idea of what has been heard, but they should not be taken as gospel. I can only suggest that you read the Introduction to *Callsign 98*.

Without knowing a lot more about the actual flight heard by Kevin Wright, it is very difficult to give an exact answer as to what was heard. However, I have personally heard many different types of aircraft flying to and from various airfields around Europe, all using different JGO callsigns, and the only common factor is that it was an American aircraft - that's what the O part of the callsign signifies. I have seen and heard Air Force, Army and Navy aircraft using JGO callsigns, and it is also used by cargo aircraft, VIP aircraft and helicopters. I would treat this entry in *Callsign 98* with a pinch of salt.



The DX-394 assembly drawing from the Tandy site.



Screen Grabs of DX-394 URLs.

■ PAUL ESSERY GW3KFE, NEWTOWN, POWYS SY16 1ZZ

■ E-MAIL: gw3kfe@pwpublishing.ltd.uk

Amateur Bands

Strange how one's attitude towards one's hobbies change with illness. During the past month Yours Truly collided with a 'bug' and the bug won the first few rounds. 'Horizontal Polarisation' included loss of interest in the shack, and even a state of total non-interest in a newly offered book of *Daily Telegraph* cryptic crosswords!

However, all's well that ends well and the keyboard is active - later than usual for me, but still in time - just - to meet the Gaffer's deadline.

Conditions

The way the Solar Flux has been creeping up since the Sunspot Minimum is of course encouraging and at times visible on the bands - occasional openings to DX on 50MHz for example. On the other hand, if you plot Flux against time as predicted back at the minimum, and then plot over that the figures as given every Sunday on most versions of the GB2RS news, then you have to wonder - are we going to have the predicted Big Peak or are we climbing a Little Hill and a Low Peak?

Nobody, of course, knows in advance, but it does look a bit as though this Cycle will not match the best of the post WW2 ones. This is one time, though when I hope I'm wrong!!

Equipment

The most important part is the 'nut between the ears' though advertisers seek to kid us otherwise. But it does bring up an important point. Don't be afraid to lash out on - and use! - a comfortable pair of headphones. If you've never used 'cans' before you will almost certainly find a place or two where they can be customised with some extra padding, but you will also be surprised how much easier it becomes to winkle out that weak and watery DX under the pile-up.

The reason seems to be that it shuts in all the noises we want and shuts out all the noises we live with, which act as un-noticed QRM. For example, as I wrote that last sentence an electric lawnmower popped up, a 'Sprinter' passed on the railway nearby, and a diesel car has parked. And I live in a quiet place!

Hi-Fi 'phones are probably the best choice nowadays though they are always of relatively low impedance. If your receiver instruction book says the headphone output is at high-impedance and you only have low-impedance cans, the first move is to try 'em anyway! Nine times out of ten the receiver and the 'phones will live happily.

For the tenth case, you need a matching transformer - and there are plenty of those around, though not labelled as such! The one I use is ex-junk sale. It originally came in a little black box labelled 240V in and 9V out. I cut off the mains plug first in favour of a telephone plug to fit the receiver and the 9V connector I replaced by a telephone free socket into which I plug the 'phones.

I finished off by adding a sticky label over the original so no-one can make safety mistakes. Construction time, from concept to first trial - under ten minutes! Perfect it ain't, but it does the job.

Letters

Firstly, an E-mail from Alan which really demanded a personal reply - but alas the 'sender' line got lost - seemingly eaten by the electronics, so I hope Alan can identify himself and accept our apologies.

Basically, Alan is starting out in an amateur radio and he asks which receiver would be best from this lot: AR5000+3, Icom ICR-8500, JRC NRD-535, or JRC NRD-545. My personal suggestion is 'none of these' at this stage.

For one thing amateurs use transceivers rather than separate receiver and transmitter. Perhaps more important, everyone I've

known as correspondents to the column has shown a marked change in their amateur radio in their first year. I'd look for something cheap and cheerful in the way of a transceiver with general coverage receive, and stay with it for at least six months after first licence. Then - sit back and think what you want to do now you've tried it all!

Paul Goodhall's life in Oxford is steadily returning to normal now his **XYL Allison** is progressing well after surgery. Paul's first comment is to remark on how patchy the bands have been. As for monitoring conditions, Paul notes that local G8PX has regular weekday skeds with K1UQV, both running the same power and beams, so by listening and logging signals, Paul gets a very good idea of what things are like over this path.

Paul has a full-size G5RV and finds it a couple of 'S'-points down as compared with the report G8PX dishes out. Now, there are other factors to consider here: a) How high is G8PX's antenna, b) How high is the G5RV and c) is the G5RV's favoured direction, after allowing for the inevitable distortions caused by local buildings and terrain, looking at K1UQV?

Also of course, owning a commercial beam means keeping it up, which in turn implies planning permission for what has become a 'permanent' structure. On the other hand, a wire antenna can be allowed to fall down regularly to reinforce the 'temporary' idea!

Of course there are wire beams, such as the VK2ABQ which can be home-brewed at small cost, work well and can be 'allowed' to fall down now and then! Commercial beams have lossy traps, don't usually benefit from falling down and new parts cost money!

Next we come to the *Just Listening* magazine from the **International Listeners Association, 1 Jersey Street, Hafod, Swansea**. The ILA is not only for amateur band listeners of course - it covers the interests of anyone who uses a receiver for hobby purposes. Well worth a membership I think.

In Barnsley lives **Colin Dean**, and I'm always thankful to open his letters, because although handwritten I can always read them! Colin stuck to sideband, which netted him, on 7MHz: AP2KSD, A45ZN, BV2RS, EX8MLE, FM5GU, RA0WBF, TT8ZB, VK1MJ, VK4MZ, YB2PBX, YC6HDF, ZL2JR, 4L/ON4CFI, 4S7BRG and 9G1MR.

At 14MHz the scalps included BA1DU, G3KLY/MM, (the QE2 near CU2), DS5USH, DU100SAN, HL0K, HS1NGR, HS0/G4JMB, JW7VK, JW0M, S0IHA, ZD7DP, Z21CS, 3V8BB, 4K80ADR, 4S7SA, 9G1NS, 9M6AAT, 9M8HI and 9V1BG.

Another step up in frequency to 17MHz where Colin caught AP2AGJ, A61AB, BV5BG, BV7GA, CT3BM, CX3AL, DS5USH, DU5GD, FR5DX, HZ1AB, JA1-2-6-7, KP4K, TA3BN, TF/DL2NWK, TK5BF, TT8ZB, TU2WK, T77M, ZD8T, 3V8BB, 5N3BAF, 5X1T, 5Z4LL, 6W8RE, 7Q7JL, 9G1YR, 9K2HAN and 9K2ZZ. Finally 21MHz for B14Q, HB0/DL1FDH, YB0DX, ZD7VC, 5N1SYT, 7Q7DC, 7Q7JL, 7Q7RM and 9G1BJ.

Oddments

Hrane YT1AD, has now made some 75000 contacts from 3V8BB in three years. QSLs to his home call. **FR5ZU** can't activate Tromelin until at least the end of the year. The Malpelo (HK0) DX-peditions is to run from September to November; on the other hand, the CY9AA operation which should have been on as I write, was cancelled.

As for the Yemen **HA5PP** was not QRV during his recent visit but did have some hopefully fruitful talks which could lead to licences. On Mauritius, we hear that **Jacky 3B8CF** is hoping to be operational on Top Band from September-ish.

That's it again. I've pruned lists drastically to get everyone a mention - sorry! As usual, letters to reach me by the first of the month, to **Box 4 Newtown SY16 1ZZ** or the E-mail address above. Thanks!

Listener Reports Wanted

GW0GHF is in Llandough, Penarth, and Brian is experimenting with 50MHz home-brew antennas. Brian is to be found on 51.510MHz most afternoons between 1400 and 1700, plus Sunday and some weekday evenings between 2030 and 2130, and he needs reports from listeners all of which will be acknowledged and QSLed.

An amateur needs a report that tells him something he wouldn't otherwise have known. In Brian's case enough reports will enable him to build up a picture of the gain and polar pattern of his new design.

A listener report to me which came from abroad, covered something like twelve hours of listening to my signals over a period of several days. Signal strength was graphed, there was a statement of how my signal compared with other UK ones, plus a nice letter and a photograph of the antenna and shack he was using. That netted him a return card by air-mail.

A few days later in came the other sort from an address within a mile: 'You were 59+ at time X Can I see your station?' - band unspecified, frequency unspecified. That went straight in the WPB!

Space Closes In!

Karl Drage E-mailed me on his birthday and commented that conditions have been very unsettled, apart from the odd short-skip 28/24MHz logging and Sporadic-E on 50MHz. Karl's E-mail set off on June 26, and he noted the Aurora event on 24th.

Just to mention Six Metres, Karl logged 9A, 9H, CT, DL, EA, ES, EW, G, GD0TEP/P, I, IF9I2ADN, IS, IT9, LY, LZ, OE, OH, OH0JLO, OH0KCE, OK, OM, OY9JD, S5, SM, SP, SP1MVA/MM in KQ08CD square, T72B/A, YL, YO, YU and Z3.

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

Maritime Beacons

LONG WAVE MARITIME RADIOBEACON CHART

Freq (kHz)	C/S	Station Name	Location	DXer
279.0	SI	Simiutaq	Greenland	L*
284.5	LZ	Lizard Lt	S.Cornwall	B,C,E,F,G,H,I*,K,L*,M,PRS,T
284.5	MA	Cabo Machichaco	NE.Spain	B,F,K*,L*,M,R
284.5	PR	Porkkala	Finland	F*,L*,Q*,R*
285.0	NP	Nieuport W.Pier	Belgium	E,F,L*,PR
286.0	TR	Tuskar Rock Lt	Co.Wexford	A,B,E,F,G,H,K,L*,M,N,PRS
286.5	FI	Cala Figuera	Majorca	B*,F*,K*,L*,R
286.5	FT	Cap Ferrat Lt	SW.France	B,F,K*,L*,M,R*,S*
286.5	NK	Inchkeith Lt	F of Forth	A
287.3	IB	I.Berenga	Portugal	L*
287.5	DO	Rosedo Lt	France	B*,L*
287.5	FR	Faerder Lt	Norway	B*,K*,L*
287.5	IB	I.Berenga	Portugal	B*
287.5	MD	Cabo Mondego	Portugal	B,L*
288.0	HH	Hoek van Holland	Holland	FL*,P
288.0	KL	Skinna Lt	Norway	B*,F*,K*,L*
288.0	OH	Old Hd of Kinsale	Co.Cork	B*,H,K,M
288.5	CT	Pt de Combril Lt	France	L*
288.5	FI	Cabo Finisterre Lt	N.W.Spain	B,L*,M
288.5	UD	Cabo Salou	S.Spain	L*
288.5	YM	Ijmuiden Lt	Holland	B,E,F,K,L*,P,Q,R
289.0	BY	Baily Lt	Co.Dublin	A,B,H,K,L*,M,N
289.5	KY	Oksøy Lt	Norway	FL*
289.5	NP	Punta Carena	Italy	F*
289.5	SN	Ile de Sein NW Lt	France	B*,F,K,L*,PR
290.0	AV	Aveiro	Portugal	L*
290.0	FD	Fidra Lt	F of Forth	A,B*,K,M
290.5	DY	Duncansby Hd Lt	NE.Scotland	A,B
290.5	SB	S.Bishop Lt	Pembroke	A,B,E,F,G,H,J,K,L*,M,PRS,T
290.5	VI	Cabo Villano Lt	N.Spain	B*,F*,L*,M,Q*,R*
290.5	VY	Visby	Sweden	K*,L*
291.0	SM	Pt. St.Mathieu	France	B,D,E,F,G,H*,K,L*,PR,T
291.0	SN	Cabo San Sebastian	S.Spain	B*
291.5	SU	South Rock LV	Co.Down	A,B,E,F,H,J,K,L*,M,N,PR
291.9	IT	La Isleta	Canaries	B*
291.9	NA	Punta Lantaila	Canaries	B*
292.0	LK	Pt de la Coubre Lt	France	L*
292.0	MH	Mahon, Minorca	Balearic Is	B*,F*
292.0	SJ	Souter Lt	Sunderland	A,F,H,K,L*,M,PR
292.0	TO	Torungen Lt	Norway	L*
293.0	CP	St Catherine's Is	I.O.W.	B,C,D,E,F,G,H,J*,L*,P,Q,R,S,T
293.0	RN	Rhinnis of Islay Lt	Is of Islay	A,B,H,K,M,N
293.0	SY	Svinoy Lt	Norway	B*,L*
293.5	RO	Cabo Silleiro Lt	N.Spain	B*,K*,R*
294.0	KU	Kullen High Lt	Sweden	B*,L*
294.0	PH	Cap d'Alprech	France	B,D,E,F,G,H,J*,J,K,L*,P,Q,R,T
294.5	KC	Old Hd of Kinsale	Co.Cork	B*
294.5	PS	#Pt.Lynas Lt	Anglesey	B,K*
295.0	SN	Sletnes Lt	Norway	B*,L*
295.5	CB	La Corbiere Lt	Jersey C.I.	B,E,F,H,J*,K,L*,PR,T
295.5	CR	Cap Couronne	France	L*
295.5	JA	Jaroslawiec	Poland	B*,F*,K*,D
296.5	RE	La Rochelle	France	B,L*
296.0	GR	Goeree Lt	Holland	E,F,K,L*,PR
296.0	KN	Knrova Lt	Norway	B*,K*
297.0	FG	Pt de Barfleurt Lt	France	B*,C,D,E,F,G,H,J*,J,K,L*,P,Q,R,S,T
297.5	MA	Mantyluoto	Finland	B*,L*
297.5	PS	Cabo Penas Lt	N.Spain	B*,K*,L*,R
298.0	EL	Eltz Lt F	Germany	D
298.0	GX	Ile de Groix	France	B*,F,K*,L*,PR,T
298.0	TA	Cabo Gata	S.Spain	B*,L*
298.5	RR	Round Is Lt	Is Scilly	A,B,D,E,F,G,H,J,K,L*,M,N,PRS,T
299.0	AD	Ameland Lt	Holland	B,L*
299.0	BN	Les Baleines	W.France	B*,L*
299.0	O	Tarifa	S.Spain	B*
299.5	NP	Nash Pt Lt	S.Wales	B,E,F,G,H,J*,J,K,L*,PR,S,T
299.5	SK	Skornvaer Lt, Rost	Norway	B*
299.5	VR	Urvaer Lt	Norway	A,K*,L*
299.5	VS	Vieste Lt	Italy	B*
300.0	CL	Cloch Pt Lt	W.Scotland	B*
300.0	MZ	Mizen Head	Co.Cork	B,C,F,H,K,L*,M,N*,RS
300.0	TI	Cap d'Antifer Lt	N.France	G,L*
300.5	KS	M.Kanin	Arctic Russ	B*
300.5	KV	Nordvalen	Sweden	L*
300.5	LA	Lista	Norway	A,B*,E,F,G,H,K*,L*,Q*,R
301.0	CA	Pt de Creach	France	B,F,G,H,I*,K,N*,PR,S,T
301.0	ER	Eierland Lt	Holland	B,L*
301.5	DU	Dungeness Lt	Kent	C,E,F,G,H,J*,J,K,L*,P,Q,R,S,T
301.5	KD	Kinnards Hd Lt	NE.Scotland	A,B*
301.5	L	Torre de Hercules	N.Spain	B*,K*,L*,M
302.0	RB	Cherbourg Ft W Lt	France	B,C,E,F,G,H,J*,K,L*,P,Q,R,S,T
303.0	BB	Bjuröklubb Main Lt	Sweden	L*
303.0	D	Rota	SW.Spain	B*,L*
303.0	FB	Flamborough Hd Lt	Yorkshire	A,B,E,F,H,J*,J,K,M,N,P,Q,R,S,T
303.0	MY	Cabo Mayor Lt	N.Spain	B*,F,K,R,T
303.0	YE	Ile d'Yeu Main Lt	W.France	B*,G*,L*,M
303.4	VC	Cape St.Vincent	Portugal	L*
303.5	BJ	Bjornund Lt	Norway	A,B,F*,K*,Q*,R
303.5	FN	Feistein Lt	Norway	A,FL*,R
303.5	IA	Llanes Lt	N.Spain	B*
303.5	OR	Punta de Llobregat	S.Spain	B*,F*,R*
303.5	VL	Vlieland Lt	Holland	L*

Freq (kHz)	C/S	Station Name	Location	DXer
304.0	BR	Cap Bear	France	B*
304.0	SB	Sumburgh Hd Lt	Shetland Is	A,B*,C,E,F,K,R
304.5	GY	Castle Breakwater	Guemsey	C
304.5	PS	Pt Lynas Lt	Anglesey	A,B,E,F,H,J,K,L*,M,N,PR
305.0	FP	Fife Ness Lt	SE.Scotland	A,B*,E,H,K,M,R
305.5	AL	Pt d'Ailly Lt	France	B,C,F,G,H,K,L*,P,Q,R,S,T
305.7	DA	Dalatangi Lt	Iceland	K*
306.0	FN	Walney Is Lt	Off Lancs	B,E,F,H,J,K,L*,M,N,PR
306.5	H	Het Lt	Poland	B*,F*
306.5	KL	Kolkasrags	Latvia	K*
306.5	UT	Utsira	Norway	A,B*,E,F,H,K,L*,M,PR
306.5	VD	Vardo	Norway	L*
307.0	GL	Eagle Is Lt	Co.Mayo	A,B,H,K,L*,M
307.0	LE	Letta Rear	Poland	B*,O
307.5	RS	Ristna	Estonia	B*,F*,K*,Q*,R
308.0	AK	Table O'Okacha	Morocco	B*
308.0	RC	Cabo Roca	Portugal	B*,L*,M
308.0	RD	Roches Douvres Lt	France	B,L*
308.5	NZ	St Nazaire	France	B*,FL*,PR*
309.5	AL	Algiers	Algeria	B*
309.5	BA	Punta Estaca Bares	N.Spain	B*,F*,K*,L*,M,Q*
309.5	FH	Fruholmen Lt	Norway	B*
309.5	MA	Marstein Lt	Norway	B*,F*,K,L*
309.5	PB	Portland Bill Lt	Dorset	B*,E,F,G,H,I*,K,L*,P,Q,R,S,T
310.0	ER	Pt de Ver Lt	N.France	B*,F,G,I*,L*,PR,S,T
310.0	IP	Capo Sandalo Lt	Sardinia	F*
310.0	KL	Kiel Lt	Germany	O
310.5	AS	Castellon	Spain	B*
310.5	GV	Genova	Italy	B*
310.5	RO	Rozewie	Poland	B*
311.0	GD	Girdle Ness Lt	NE.Scotland	A,B,K,M
311.0	NF	N.Foreland Lt	Kent	B*,E,F,G,H,J*,J,K,L*,P,Q,R,S,T
311.5	LP	Loop Hd Lt	Co.Clare	B,H,K,M
312.0	OE	Oostende	Belgium	B*,E,F,K,L*,P,Q,R,T
312.0	SP	Cap Spatel	Morocco	B*,L*
312.0	UH	Eckmuhl Lt	France	B*
312.5	AK	Akmenrags	Latvia	B*,K*
312.5	BK	Baltiysk	Russia	B*,K*,R*
312.5	BT	Mys Taran Lt	Latvia	B*,K*,R*
312.5	CS	Calais Main Lt	France	B,F,L*,P,Q,R,T
312.5	DB	Dobbsky	Ukraine	B*
312.5	KA	Klaipeda Rear Lt	Lithuania	B*,R*
312.5	LB	Liepaja	Latvia	B*,K*,R*
312.5	VS	Cabo Estay Lt	N.Spain	J,K,L*
312.6	KB	Krautsand	Germany	B*
313.0	HA	Haltten Lt	Norway	B*,L*
313.0	PA	Cabo de Palos Lt	S.Spain	B*,F*,L*,T*
313.0	TY	Tory Is Lt	Co.Donegal	A,B,H,K,M
313.5	BR	Cap Bear Lt	S.France	L*
314.0	HK	Hekkingen Lt	Norway	L*
314.0	PQ	Porquerolles	S.France	B*,K*,L*
314.0	VG	Ile Verte Lt	France	B,C,E,F,G,H,I*,K,L*,M,PR,T
314.0	WU	Wustrow Lt	NE.Germany	B*
314.5	CM	Cromer Lt	Norfolk	B*,C,E,F,H,J,K,L*,P,Q,R,T
314.5	TL	Punta D.Penna	Italy	B*
315.5	ND	Nidden	Lithuania	B*
316.0	IN	Ingolshofdhi Lt	Iceland	L*
337.0	MY	Myggenaes	Faeroe Is	B*,F*,K,L*,R*
352.0	RBA	Rabat Sale	Morocco	L*
372.0	DZN	Prins Chms's Sund	Greenland	B*,K*,L*,R*
381.0	AB	Akraberg	Faeroe Is	B*,F*,K,L*,R*
404.0	NL	Nolso	Faeroe Is	B*,F*,K,L*,Q*,R*

DXers:-

- (A) Kenneth Buck, Edinburgh.
 (B) Robert Connolly, Kilkeel.
 (C) John Eaton, Woking.
 (D) Geoff Halligey, Bridgend.
 (E) Brian Heath, Stapleton.
 (F) Brian Keyte, Gt.Bookham.
 (G) George Millmore, Wootton, IoW.
 (H) Albert Moore, Douglas, IoM.
 (I) Fred Pallant, Storrington.
 (J) Peter Pollard, Rugby.
 (K) Victor Robb, Belfast.
 (L) Peter Rycraft, Wickham Market.
 (M) John Stevens, Largs.
 (N) Kelvin Sutherland, Anglesey.
 (O) Andrew Tett, while near Hamburg, Germany.
 (P) Philip Townsend, E.London.
 (Q) Eric Tubman, Whitstable.
 (R) Fred Wilmshurst, Northampton.
 (S) John Woodcock, Basingstoke.
 (T) Ross Workman, Shoreham-by-Sea.

Note:

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

A number of alterations to the beacon service were observed by some of the listeners who searched the band during April, May and June. They found the Dungeness beacon (DU) on 301.5kHz instead of 300.5; Pt.Lynas (PS) on 304.5 (not 304.0); Cromer (CM) on 314.5 (not 313.5).

No trace of the Pt.Lynas calibration transmission on 294.5 was found by Albert Moore (Douglas, IoM) and Robert Connolly (Kilkeel) mentioned that he has not heard it since early April. Since the frequency of the Pt.Lynas beacon (PS) was changed the reception of Sumburgh Head (SB) on 304.0 has improved in some areas. In Edinburgh, Kenneth Buck noted it as 'a very clear signal' and it was logged for the first time by Brian Heath (Stapleton) and Brian Keyte (Gt.Bookham).

The Danish beacons at Hammerodde (MN) on 289.5; Blavandshuk (BH) 296.0; also Gedser (GR) 303.5 were reported as 'unusually absent' by Brian Keyte and Kenneth Buck was unable to find a single beacon in Sweden or Denmark during his search but he did pick up strong signals from a number of Norwegian beacons which appeared to be functioning normally.

In Rugby Peter Pollard found the longer twilight period around 2000-2100 less favourable for DXing but the sky waves from some quite distant beacons were received later by other listeners. Several DXers heard beacons they had not received before; 284.5 PR, 290.5 VI, 310.0 IP by Brian Keyte; 288.5 YM, 296.0 GR, 304.0 SB, 304.5 MY by Victor Robb (Belfast); 279.0 SI, 292.0 TO, 300.5 KV, 303.0 BB, 306.5 VD, 312.0 SP by Peter Rycraft (Wickham Market); 284.5 PR, 293.5 RO, 308.5 NZ, 312.5 BK, BT & LB by Fred Wilmshurst (Northampton) - refer to chart for more details.

In some locations the more distant beacons were masked by local electrical interference. A buzzing noise at 33kHz intervals across the band plagued Keith Seddon in Chapel en le Frith. He traced it to an Osram EL long life lamp.

The interference started at 160kHz, peaked between 290 and 295kHz and was still audible well into the medium wave band! Despite the high level of electrical noise at his new location Kelvin Sutherland (Llangefni, Anglesey) found that he could receive some beacons - see chart. He is now giving some thought to the most suitable antenna.

The fourth edition of the LW Marine and Aero radiobeacon guide by Robert Connolly is still available. If you would like an information sheet about it write to Robert via me, enclosing an s.a.e.

Propagation Forecasts

How to use the Propagation Charts.

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

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

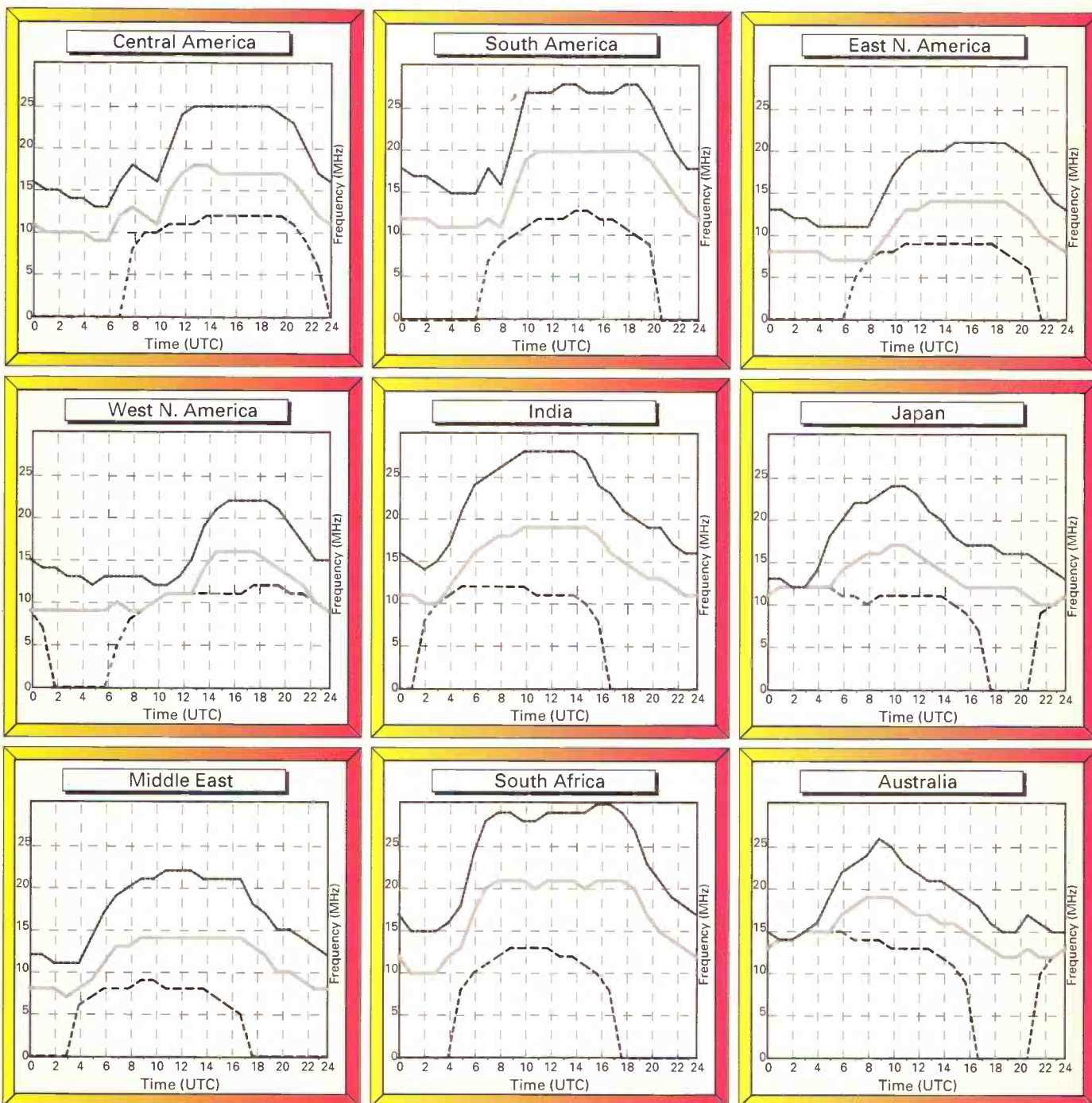
Lastly, the upper dashed line, represents the maximum usable frequency (MUF) a 50%

probability of success for the path and time.

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

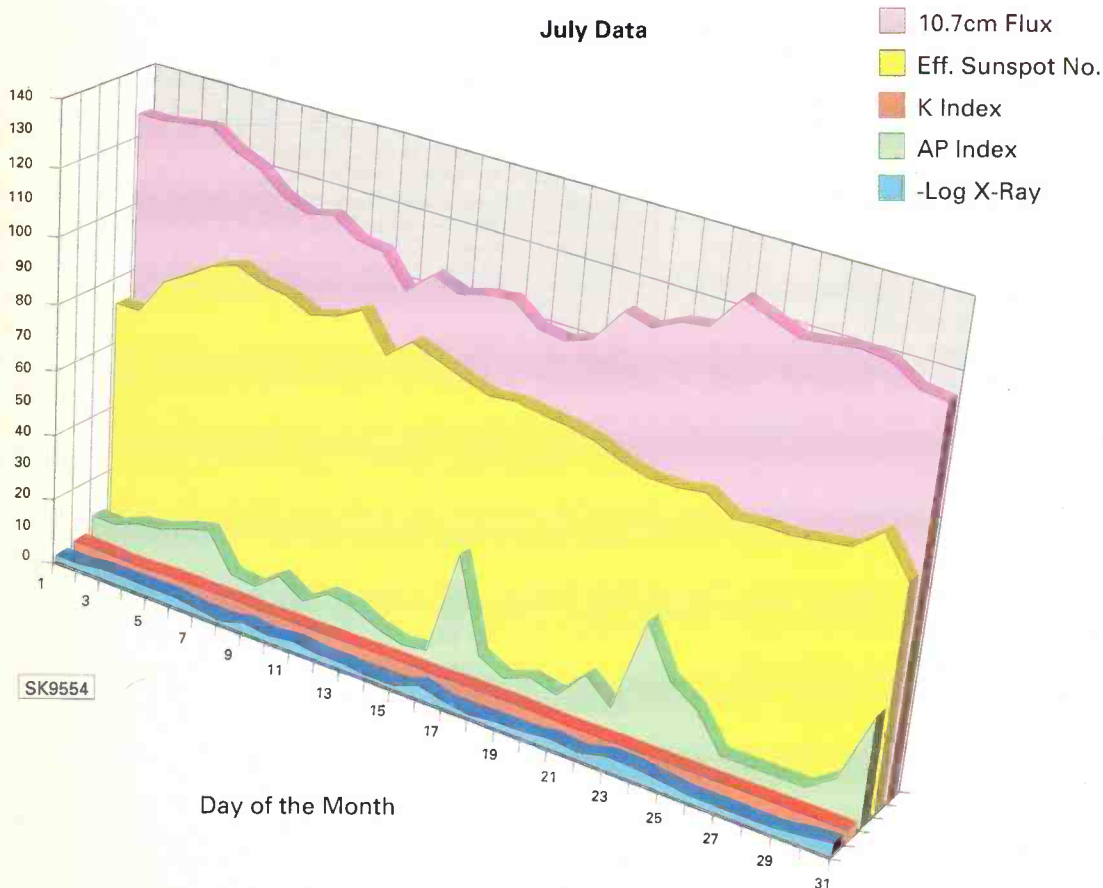
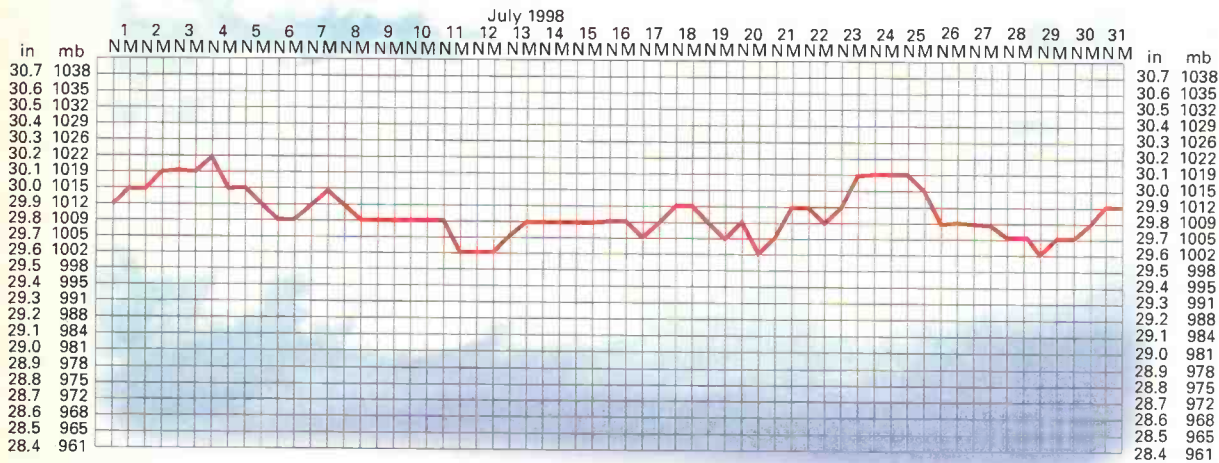
Good luck and happy listening.

September 1998
Circuits to London



Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, July 1998.



guide to the chart

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

The K and AP indices are measures of geomagnetic activity.

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

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

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

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Airband

Britain's newest international airport is Sheffield (I say without risk of contradiction, I hope!). Plenty of news from here is sent by Leslie Griffiths who lives under one of the flight-paths, aircraft passing so close overhead that he can read their registrations! Once established in the circuit at 1500ft height, though, I'd expect typical light aircraft registrations to be just on the point of having become too far away to read.

If Leslie is in (or bordering) the town of Sheffield itself then I'd expect the airport to be to his east. Further east still is the M1 motorway. So, arrivals on runway 10 or departures on 28 will come overhead (unless they turn when very close to the airport).

I'm not sure what the unpublished frequency 455.225MHz is but I suspect that allocations in this part of the spectrum are for ground operations vehicles.

Likewise, 150.225MHz is outside the airband. A strange effect occurs at certain frequencies. Most radio receivers convert the incoming signal to a fixed frequency. This is known as the intermediate frequency (i.f.) and is internal to the radio set.

Usually, the listener wouldn't have to know about it. Under some conditions in which a strong signal reaches a set with poor selectivity, the signal appears at two different frequencies on the radio. It's only really transmitted on one frequency but the radio seems to receive it on a second frequency, also.

This second (non-existent) transmission is called the image, the ability of the set to avoid this effect is called image rejection. The more image rejection (specified in dB) the better. The image will always be twice the i.f. away from the real signal.

Here's an example. Sheffield is on 128.525MHz. If a radio's i.f. were 10.85MHz, then adding two times 10.85 to 128.525 would give a potential image on 150.225MHz.

When instrument approaches are being checked, a suitably-equipped calibration aircraft flies by instruments whilst its flight path is monitored from the ground. I believe this work has been put out to private contract but I imagine the state-owned HS.748s were 'donated' to the contractor as part of the deal.

I'm a tax payer, I reckon it's mine, they should have given me first refusal! Anyway, I'm not sure what the Shackleton-like aircraft was that Leslie saw as only one Lancaster now flies and I don't think any Shackletons are airworthy at present.

ACARS

Aircraft Communications Addressing and Reporting System. This is a means of sending bursts of data over v.h.f. radio, whenever the need arises. Range is an extended 'line of sight'. Often mentioned in this column, the aircraft can automatically report its take-off time (for example) to company operations departments. Likewise, operations can send last-minute flight plan changes to the crew.

Another means of data communication, mentioned by Leslie, is secondary surveillance radar Mode S. This is in the u.h.f. spectrum. A radar pulse from the ground triggers a brief data transmission from the aircraft. Currently, Mode 3 provides a four-digit 'squawk' number and, additionally, flight level can be added in Mode 3/C.

Now, Mode S is an extension of this basic system that has not been widely adopted at ground radar installations. Far more data can be sent and potentially appear on the radar screen. However, this is unsuitable for communication with company operations as transmission is dependent on interrogation by a radar

head in the first place. Upgoing data from a company is therefore not possible.

Follow-Ups & Foul-Ups

I hope you found my article 'The Long & The Lat Of It' (July issue page 39) useful. To clear up any misunderstandings, there were three errors in the final edition. On page 42, **Fig. 1**, the North pole wasn't marked - but you probably guessed that it was at the top of the diagram, on the broken line, at the end opposite to the South pole.

Again, page 42, 'Longitude' second paragraph, it says: "This time, I've drawn OUT a radius..." when it means "...I've drawn NOT a radius..." Then, page 43, second column, third line, gives an example "...with decimal minutes instead of seconds..." and the accompanying value should be E030°9.05' (the minutes symbol was missing).

Q-Codes

Back to June's 'Airband,' where I mentioned various Q-codes that designate altimeter settings. **Frank Le Blancq** (Jersey) provides a fuller definition of QFF.

This is, as mentioned, the QNH value corrected for temperature. As far as aviators are concerned, the error is only important in exceptionally cold conditions. For meteorological purposes, though, precision demands that this value is always the one chosen by weather forecasters. It's actually the value you see on weather chart isobars.

As far as the comparison with QNH goes, Frank explains that there is little difference at sea level. Go 4000ft up a mountain and the difference could be as much as 11hPa. Thanks for the professional meteorologist's view on this, Frank.

Quite a lot of the information in 'Airband' is not so much over-simplified as distilled. I feel that the experts among you will happily consult a reference book when wanting the fine details.

The purpose of 'Airband' is to introduce and explain technical concepts to everyone else. For example, I referred to the confusing change from mB to hPa as being a more scientific way of expressing the same thing. I didn't go into the fundamentals of SI units, although that's really what it's all about.

So, readers, are you satisfied with learning about technicalities at this level - or would you rather that 'Airband' became more akin to a textbook that appears in monthly instalments? I am always interested in your opinions, so please write in if you have any feelings on the matter. Otherwise, I'll assume I'm giving you what you want and will dish up more of the same!

More reminiscences of aircraft types that are now historic from **Arthur Oglesby** (Harrogate). The Swallow required full rudder on take-off to counter propeller torque. Crosswinds wouldn't have been a problem in those days as an airfield was exactly that. You could take-off in any direction you liked on the big grass field, so putting the wind on the nose would have been easily possible.

Arthur often visits Alaska (where I suppose the fishing's good). Modern British parents are often asked by their teenage children, "May I have the car tonight?" but in Alaska (where distances are greater) the kids borrow their parents' aeroplanes!



Abbreviations

AIPA	Aeronautical Information Publication
CAA	Civil Aviation Authority
CD-ROM	Compact Disc - Read Only Memory
dB	decibels
E	east
ft	feet
hPa	hectopascals
HS.	Hawker-Siddeley
kHz	kilohertz
mB	millibars
MHz	megahertz
PC	Personal Computer
QNH	altimeter pressure setting, reads height above sea level
SI	Système Internationale d'Unités
u.h.f.	ultra high frequency
v.h.f.	very high frequency

Mooney at Quiberon.
Christine Mlynek.



Receiver Hardware

It is understandable that **Kevin Hughes** (Tamworth) would worry over future receivers. The present civil v.h.f. communications airband is spaced at 25kHz intervals but plans are imminent for reducing this to 8.33kHz. I suspect that the authorities would find this cost-effective as only certain ground equipment would need to change. Unfortunately, other purchasers (including the airlines) don't agree as they need full airborne capability.

In fact, only certain airways (*en-route*) frequencies will be affected, there does not appear to be any plan to put local aerodromes on the newly-created channels. The final decision does not yet appear to have been made, but the authorities rarely change their minds!

Software Review

NavBox *QuickPlan* will prepare professional-looking flight plans on a reasonably fast PC compatible machine. On the screen is displayed a map of your chosen part of Europe with various scales selectable. Coastlines, international airspace boundaries and latitude/longitude lines are shown.

Your position is a mouse-controlled cursor. In addition, a menu chooses whether or not you show beacons, airports, etc. Reporting points only appear at airway intersections but you can define your own and even name them. Disappointingly, the name of your own point will not display on the map.

Having read my article on lat/long (as mentioned above) you'll now find it easy to navigate round the map. If you position the cursor over, say, an aerodrome, it tells you - and even the frequencies are listed.

It prints a detailed flight plan but the map has first to be transferred to the *Paint* package (part of

Windows95) before printing is possible.

On a reasonable system, it didn't take too long to draw the map on-screen and with a 233MHz processor it's obviously quite fast. A proprietary package did not report any virus on the single CD-ROM on which the software is supplied. Two floppies are apparently offered as an alternative.

Special offer copies at an air rally cost £10 but I suggest you write for the latest price (including postage) to: **NavBox, 133 Lovibonds Avenue, Locksbottom, Kent BR6 8EN.**

Frequency & Operational News

From **Martin Sutton** (CAA) come the *AIP* amendments.

Aerodromes first. Manchester Radar 118.575MHz is not really new, it's the old Arrivals frequency upgraded to a radar service.

Airways next. London Airways 129.6 is replaced by 127.825MHz, affecting a number of lower, upper and conditional routes. More details will be printed if anyone insists. UR123 from abeam Lambourne to Clacton is on 133.45 and UR126 is on 118.475MHz.

Reporting points. West of Orkney, helicopter routes X and Y lose ANTON and TIGGY, replaced by nearby SODKI and MADOX respectively. Follow UR23 well to the east of Edinburgh, out into the North Sea, where you will find points CUTEI and GIRDO; now FILET has been inserted between them.

All letters received up to July 8 have been answered. The next two deadlines (for topical information) are September 7 and October 5. Replies always appear in this column and it is regretted that no direct correspondence is possible.



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MilAir

Two letters arrived within a couple of days of each other regarding two flights of four aircraft seen and heard on June 5th. Martin in Norwich and Adrian from Woodstock near Oxford, both noted these aircraft and have both asked me to check with our readers to see if anyone can supply any further information.

Mystery Flight?

The two flights entered UK airspace via reporting point MC6 in the North Sea and then followed Military Tacan Route 1, (TR1), across the UK via reporting points, Coltishall, Mildenhall, Brize Norton, Yeovilton and Lands End. The callsigns were **PROTON 11 to 14** and **PROTON 21 to 24**. Both of my correspondents concluded that the first flight had an American pilot but the second flight was lead by a pilot with a European accent possibly German or from one of the former eastern block countries?

The aircraft were at Flight Level 330 until just before Yeovilton, they then descended to FL250 to meet up with a tanker in Air Refuelling Area 7, (AARA7). They used standard London Military frequencies across the country and were on **262.975** when they descended at Yeovilton, they then made one check in call on 240.4, (which is a known Air Refuelling frequency), and then the lead aircraft said, "Go refuelling channel 2".

Adrian, who was at Brize Norton at the time, says he scanned through all of the well-known air refuelling frequencies for some time but heard no further calls and did not hear any call whatsoever from the tanker. After about twenty minutes the aircraft returned to 262.975 and continued their journey out past Lands End. They then went onto h.f. with Shanwick Control, but Adrian could not follow them any further as he did not have an h.f. capable radio with him.

The most interesting piece of information came from Adrian's letter, he missed the first flight because of cloud but he got a good look at the second flight of four aircraft. To use his own words, "I have been an enthusiast for thirteen years and I like to think that my aircraft recognition is quite good, consequently I am confident that the second flight were Mig 29s, they were light in colour, possibly white rather than grey". If this ties in with the pilots accent perhaps they could be Czech or Slovak Air Force? The first flight with the US pilot remain unidentified - Any ideas anyone?

Fairford B-1B Deployment

An E-mail from **Steve** gives details of the B-1B deployment to RAF Fairford. Six aircraft from the 7th Bomb Wing have been operating from the Gloucestershire airfield during June, callsigns noted have been **DARK** and **BONE**. A 7th BW operations frequency, callsign 'Bone Ops' has been noted on **282.85**. A second anonymous correspondent also noted a second operations frequency of **337.25**, can anyone else confirm this?

Mildenhall Air Fete

Rarely does a month go by without some information arriving appertaining to Mildenhall, this month was no exception with six separate letters and E-mails. I missed the show this year for the first time since the mid seventies, but judging by your comments I may not have missed too much. The overall tone of the letters I have received was that apart from a couple of star items most of you were rather disappointed with the show compared to previous years. It seems that

even some of the more interesting aircraft were left on the South side of the airfield when there was plenty of room to put them in the static on the North side! The United States Air Force were noticeable by their absence, who would have dreamt of a Mildenhall show without a KC-10A or a B-52H?

A few callsigns of interest that were noted: VMFA-321 FA-18A **COMBAT 31 & 32**, 81st FS A-10A **ATILLA 01**, 4th SOS AC-130U **SPOOK**, 53rd WRS WC-130H **TEAL**, 412th TW NC-141A **ARRIS** and R. Netherlands Air Force 298 Sqn CH-47D **OMEGA**.

One new frequency was noted, with some visiting aircraft calling SCORPION OPS on 362.55 with maintenance reports. Is this a new frequency for Mildenhall or as a friend has suggested that it was in temporary use during a recent exercise?

Military Antennas (New)

In response to a request from a reader for sources of military airband antennas, I am in debt to Rob Smith who is the Sales Manager of **Racal Antennas**. Rob has kindly sent me details of their current range of antennas, which includes two specifically designed for military v.h.f. and u.h.f. airband use. Racal originally produced a combined v.h.f./u.h.f. discone, but about five years ago to give better water-proofing, less corrosion and fewer electrical faults they produced two new antennas dedicated to each of the v.h.f. and u.h.f. airbands.

Racal RA957: The v.h.f. antenna, the RA957 is a folded monopole, Omni-directional antenna with $3\lambda/4$ radial elements and a frequency range of 115 - 150MHz. It uses an N-Type connector and is 950mm tall by 500mm wide, the weight is 3.5kg.

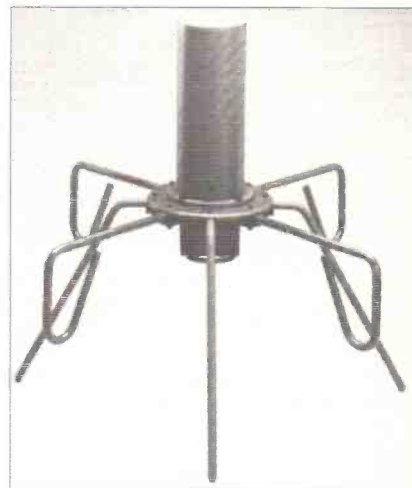
Racal RA978: The u.h.f. antenna, the RA978 is also a folded monopole, vertically polarised Omni-directional antenna, which has a frequency range of 220 - 400MHz. It is 600mm tall by 600mm wide and weighs 4kg.

These antennas are available new from Racal Antennas, but as with any quality item they are not cheap. The v.h.f. antenna - RA957 is £410.50 and the u.h.f. antenna - RA978 is £357.20, both prices include VAT. These prices may seem high but it should be remembered that these antennas are both built to very high military specifications and are designed to withstand just about anything the elements can throw at them.

As each year passes by, we seem to be having more and more violent storms in the UK with the inevitable damage to roof-top equipment. These Racal antennas will by far exceed the life span of the average £60 aluminium discone. As a consequence, the dedicated airband listener should seriously consider the long-term financial outlay for such a robust antenna.

For further information, any reader with a **serious interest** in these two antennas should contact Racal at the following address:

Mr. R. Smith, Sales Manager, Racal Antennas Ltd., First Avenue, Millbrook Trading Estate, Southampton, Hants SO15 0LJ. Tel: (01703) 705705. Thanks again for the information Rob.



The u.h.f. RA978 antenna



The RA957 v.h.f. antenna

Military Antennas (Used)

Staying with the subject - a reader from Sheffield recently visited the Elveston Castle Rally where he bought an ex-MOD antenna which was described as having a range of 25 - 1200MHz. It came complete with brackets and fittings and he describes it as "a collinear antenna about one metre in length" - The cost was £10. He reports that it works well on the airbands, so much so that it outperformed his discone. Unfortunately, he does not know the name of the company he bought it from. Can anyone who helped organise or visited this rally, identify the company in question who sells this ex-MOD equipment?

Satellite TV News

Satellite zapping football fans have experienced the year of their lives with World Cup football across the satellite belt, both analogue and digital continuing on from through June into July - perhaps diluting the usual June offerings of Wimbledon tennis and providing for many, signals from the new *Intelsat 801* @ 31.5°W.

If you're not a sports fan then there's been plenty to check out though, for example the Rolling Stones 1st stop on their 'Bridges to Babylon' European tour at the Zeppelin Field, Nuremberg, Germany, evening of June 13th. *Intelsat K* carried an evening live broadcast from the concert venue showing the final preparations and promotional recordings taking place. The latter recordings were played out into a live 45 minute programme that detailed the backgrounds to the group, the European tour and included two live numbers from the concert.

Unusual that the *Intelsat K* feed carried details that the concert offering would be distributed across Europe via *Eutelsat II F2* @ 10°E - 11.633GHz horizontal, audio 6.6/7.2MHz. An interesting programme and of course in traditional analogue!

And another concert venue but less than wonderful weatherwise was Glastonbury and Monday morning 29th June found the UKI-149 SNG GMTV SNG unit offering a live report on *Intelsat K* from the Somerset festival site, shots of muddy tents, muddy event goers and more mud. The presenter commented

that June '98 wasn't the wettest June (yet!) on record as only 4in had fallen up to the 29th - June '97 held a 100 year record for precipitation.

GMTV is usually found on *Intelsat K* in the early UK mornings with live feeds back to the breakfast show studio, July 6/7th and our stalwart crew aboard UKI-76 are found on the roadside at Drumcree, NI, caught up in the Orangemens' march confusion, the 7th and the SNG truck was trapped within the immediate area as the deadlock resulted in local road blocks.

Backtracking to World Cup football, the USA outgoing feed June 27th via 21.5°W found the ABC-ESPN engineer clapping his hands with an overlaid caption 'Lip Sync Test'. Problems obviously that day *en-route*, to minimise vision/picture sync disturbance or loss the video path usually passes through frame stores at various points back to the distant studio centre.

Each frame store 'loses' a picture frame which on a complicated circuit might have three or four frame stores. This results in the sound arriving early, i.e. before the picture - to re-sync the base band components it's necessary to insert audio delay to match up the picture and sound once more.

Digital delays are small rack mounting units with easily adjustable time delay constants. That's what the ESPN lip sync test was about.

More sabre rattling in the Yugoslavian region once more with conflict along the Albanian border, sufficient to engineer warning flights by NATO jets over the nearby towns to show their commitment to use force to prevent further Albanian intrusion, pictures of the jets over-flying a local town were carried - once more on *Intelsat K* - June 15 from the Athens, Greece bureau of Reuters.

Roy Carman (Sandown, I°W) and others watched Sky News and the BBC in action June 16/17/18th ex Boston, USA and then back in the UK when Louise Woodward was released and departed the 'States for home. Sky made extensive use of *PAS-3R* @ 43°W for much of the evening and the following morning with live reports on the hour, the return found the BBC using *Telecom 2D* @ 5°W (11.606GHzV) for the Louise UK return coverage.

An interesting feed (*PAS-3R*, June 9, 12.705GHz H via New England Satellite) was seen prior to the Woodward return in which a US lawyer commented on perceived irregularities with the Woodward fighting fund, a received but forged invoice, personal use of the UK fighting fund money, etc. This was aired apparently via *Sky News*.

Bradford, and *SWM* reader **John Womersley** says that following a mention on the free-to-air horse racing for Scandinavia via *Sirius 5°E* bird the pictures were lost in encryption and now a CAM is required to resolve the digital signals (CAM = Conditional Access Module). John also answered a query 'where is the Sainsbury supermarket stores video feed carried', it's now digital on *Eutelsat II F3* @ 16°E but encrypted (more CAMS needed) at 11.128GHz horizontal.

And a tip for digital box user/readers - Associated Press TV on 13°E digital can be resolved now that PIDS are required... 12.549GHz Hor/5632/3/4/ (v512/a650/f8190).

Sports - tennis, football, gold, motorsport and for **Dean Rogers**, an exciting month in Abbeywood, SE2! There was life other than football - including live golf - Womens European Tour, Evian Masters ex France carried on *Telecom 2C*, 3°E for Canal+ and Eurosport, golf too from the UK with the live British Amateur Championships from Muirfield carried again on *Telecom 2C* for the BBC for motorsport the FIA World Rally Championships live from Greece in clear PAL via *Eutelsat II F4* @ 7°E - but it was mainly World Cup football that dominated the sporting sky...

Both **John Locker** (Wirral) and Roy Carman (I°W) commented on the fantastic pictures from space with a recent *MIR/Challenger* docking mission. John accessed the weak direct feed ex *MIR* to *Altair-2* @ 16°E - 10.1830GHz which was cross strapped onto *Intelsat 705* @ 18°W in C-Band (4GHz) for onwards transmission West to NASA. Meanwhile Roy picked up the return feed ex NASA Eastbound via *Intelsat K*.

In last month's column I reported on sightings of the new Nilesat bird @ 7°W. John caught a sight of the new *THOR-3* satellite coming up from the West and on test transmissions at 11.800GHz vertical June 18th and 11.727GHz vert. By now the satellite will have located at 1°W for service into Scandinavia.

I've no idea how the Worldnet feed of the VOA-TV was received by the target audience evening of June 26th, both the Serbian offering at 2100 and the 2130hrs Bosnian programmes were of the most appalling quality, severe signal fluctuation and the picture quality itself was over-exposed, audio too was absent.

The signal was carried via *Eutelsat II F2* @ 10°E, 11.153GHz horizontal - unless the dreadful technical standards



Fig. 1: The UK SISLINK company offer OB uplinking from any remote site in Europe. Seen on *Intelsat K* @ 21.5°W.



Fig. 2: Ident caption for the American ESPN sporting network on *Intelsat K*.

were a less than subtle form of encryption...(?). Overall a busy month for traditional analogue TV by satellite.

Orbital News

December 25th last and *AsiaSat-3* was an insurance loss when the Russian *Proton* rocket failed to orbit the *HS 601HP* bird correctly and it settled into a highly elliptical orbit. Hughes the manufacturers agreed with the insurers to attempt re-orbiting/correction for the now named *HGS-1*.

May 13th and an initial trans lunar orbit was made by firing the craft's motors which put the bird on return into a satisfactory position sufficient to attempt a 2nd lunar trip and June 18th saw a final burn on its latest return and putting *HGS-1* into a useable geostationary slot over the mid Pacific - though suffering a little N/S inclined orbital drift. It's capacity is now available for lease, the revenue shared between Hughes and the insurers.

The new *AsiaSat-4* satellite launch is being delayed anything up to year 2000 due to the unhappy state in the Asian economy, the company reckon to maintain their operations with the existing satellites plus the replacement *AsiaSat-3R*.

Successful Canal+ is planning a SE Asian trip with a co-operative venture on a Taiwanese digital platform Winter '99 - Carnival Star. About 50 international and regional channels will be on offer plus the usual radio and multi-media peripherals. Mediaguard encryption will be used and at least 20 Asian companies will be making the decoder boxes.

A new animation channel 'Animax' will be launched in Japan by Sony Pictures on the SkyPerecTV digital platform. This is the largest digital TV service with nearly 700 000

subscribers and 170 TV channels. Their rival - DirecTV - has 110 000 subscribers viewing up to 130 channels.

The Antena 3 group are to offer ten TV channels and sell to any/all of the digital platforms now covering France. Digital satellite TV in France has proved popular with nearly three million subscribers signed up for either CanalSatellite, AB Sat or Television par Satellite - more than subscribe to cable. Over one million customers signed up for a single digital platform in 1997 with total revenue earned currently \$US250m in that same period.

Not so happy news with the

Indovision Pay-TV operation with a fall-off in subscription levels to only 600 monthly. Total customer base to date is around 37,000 and at least 450,000 are thought to be necessary for financial stability. When the service dropped B-MAC in favour of digital some 7000 didn't make the move into digitland. The UK lost its CMT service end March but our loss is another's gain, CMT (Country Music Television) have opened a 'customised' service across the Asia/Pacific basin region.

Reuter have announced an expansion of their news services following their unsuccessful buyout of the APTV service - which WTN bought in June. Reuters are leasing AsiaSat capacity from this Autumn to bring a higher profile into the Asia/Australasian regions.

The Reuters Thursday only media entertainment bulletin will be increased to a daily offering, free to broadcasters until October. Also just appeared across SE Asia is the the Discovery/BBC 24 hour 'Animal Planet' channel, preceeding by a few days launch of the NBC-National Geographic Channel! 'Animal Planet' will expand covered into India early in '99.

Intelsat news releases - their 805 bird launched successfully on June 18 and slotted 55.5°W and offer 'high quality multimedia services to the Americas and Europe'. A 4GHz C-Band bird it can provided EIRPs up to 40dBW allowing use of dishes down to 1.8m. The Islands of Comoros became the 143rd member of Intelsat, this is a small group in the North Mozambique Channel, a French possession with 630 000 population.

Eutelsat have detailed their new satellite SKYPLEX system of on-board multiplexing of incoming uplinked signals. This system allows up to six individual uplink signals of 6.3Mbps to be combined on board to provide a downlink of 38Mbps.

It allows direct uplinking from small sites rather than terrestrial combination of the six sources and then uplinking the total mixed signal package. Eventually bit rates down to 350Kbps will be 'Skyplexed' when *Hot Bird 5* flies to 13°E this Summer.

Finally, bad news for sat-zappers even when digital reception has been sorted, Sony have introduced their twice data speed package type DSM-T1 for the uplink transmission and the DSM-R1 demodulator at the downlink receiver allowing double speed transmission/reception of data/picture and saving transponder rental charges.



Fig. 3: Local station KAMU-TV gets involved with a corporate TV operating in Texas.



Fig. 4: Many foreign broadcasters took their own equipment into France for the World Cup to complete picture editing, etc.

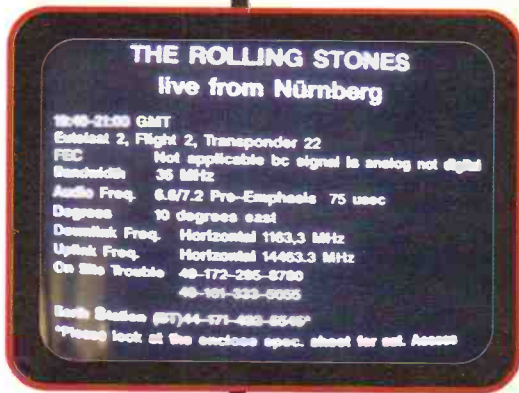


Fig. 5: The Rolling Stones 'Bridges to Babylon' tour hits the road in Germany.



Fig. 6.



Fig. 7.



Fig. 8.



Fig. 9.

Fig. 6: Renewed interest in Woodward Case took SNGS back to Elton.

Fig. 7: CNN Berlin links into CNNI each morning.

Fig. 8: Word Cup edit suite for US TV on 21°W.

Fig. 9: World Cup English Hotel.

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Info in Orbit

It seems to have been 'all change' with the WXSATS during July. NOAA-15 unexpectedly started transmitting high quality a.p.t. (low resolution) imagery, METEOR 2-21 failed, METEOR 3-5 resumed transmissions and GOES-9 (an American WXSAT) showed symptoms of imminent failure. METEOSAT-5 started unexpected WEFAX transmissions, and add the possibility of images from a new Russian RESURS satellite and we have an interesting scene!

Current WXSAT Operations

As briefly mentioned last month, the v.h.f. antenna on NOAA-15 suddenly 'clicked' into its correct place during the early hours of 17 June, resulting in the immediate improvement of a.p.t. images. There had been some prior indications to the operations staff - who monitor the 'house-keeping' telemetry - that the antenna boom was slowly deploying. 'House-keeping' data refers to the onboard electronics and routine physical measurements of temperature. This data is incorporated into some of the telemetry.

An early start on the morning of 17th June let me receive the first NOAA-15 pass of the morning - and left me wondering why the signal was not fading. After ten minutes it was obvious that something dramatic had happened overnight - the data was continuous and the image perfect. Subsequent passes - see Fig. 1 - indicate the 'fix' seems permanent.

As is the case with the earlier NOAAs, NOAA-15's orbit is sun-synchronous, but the orbital plane is several degrees away from NOAA-12 so images are received in conditions of different illumination. Visible-light images from the morning passes are brighter than those from evening passes. Instances of sun glint are frequently seen in NOAA-15's images, though not so clearly in this cloud-covered example!

With three operating NOAA WXSATs, METEOR transmissions during June seemed somewhat sparse. The ageing METEOR 2-21 failed around 24 June, after which only a token, non-a.p.t. signal could sometimes be detected as it passed over. My main WXSAT scanner ignored the non-a.p.t. METEOR 2-21 signal - which is exactly what it is designed to do - but the general purpose scanner continued to lock on the r.f. carrier.

When possible, I operate two independent scanners, the WXSAT receiver, and one capable of tuning to a wide variety of frequencies - just for the interest of hearing satellites and their different tones.

Despite the various formal messages that are regularly issued on the Internet about METEOR operations, METEOR 3-5 unexpectedly resumed transmissions on 10 July.

I logged a low elevation easterly transmission at 1308UTC, followed by later passes. Figure 2 was received using 'software synchronisation' in which the software looks for the black-white bars

to form an edge of the image.

By early July, METEOR 3-5's orbital plane had moved away from the 'twilight zone' (sunrise-sunset line) and is now in full solar illumination - except when it passes into night. By mid-September it will have precessed towards the following terminator so we might then see the next 'switch-off'. It is possible that the WXSAT might have failed before that.

New RESURS Satellite

A new RESURS satellite has been launched. Signals can be heard on 137.25MHz but so far they are not a.p.t.

GOES-8 live images in Plymouth (and elsewhere!). I have mentioned the possibility of reception of GOES-8 telemetry from the western side of Britain. This WXSAT is positioned over the east coast of America as their 'GOES-east' satellite where - from Plymouth - it is about three degrees above the western horizon.

By carefully pointing a 45-element Yagi westwards, and then experimenting with different locations within the yard, I found a position where a fair, though noisy signal could be obtained. For this operation I had to remove the pre-amp from my METEOSAT dish for connection to the Yagi. The Yagi was then carefully rotated to maximise the signal.

A succession of GOES-8 images were received. Like METEOSAT-7, GOES-8 not only transmits images from its own radiometer but also those originating from GOES-9 (imminently GOES-10 that is positioned further west) and several composites from the NOAA polar orbiting WXSATs.

Consequently, GOES-8 images are very informative. They had a small amount of noise remaining - not unexpected because of the bushes through which the signal is being received - so a smoothing process has been used to improve image clarity.

In this GOES-8 USIR format (infra-red) image, a storm can be seen in the northern region of Oklahoma. Such severe weather frequently prompts the authorities to put the satellite into a 'super rapid scan operations' mode, in which more frequent scans of the storm region are made and quickly passed to the weather agencies and local authorities.

In this image - as with all those shown here in colour - the original scanned image is black-and-white. Colour is added by using an overlay mask and replacing the grey-scale with a colour shade, according to a pre-defined table. The result



Fig. 1: NOAA-15 image received at 0818UTC on 25 June.



Fig. 2: METEOR 3-5 1642UTC 10 July (small section of the pass).

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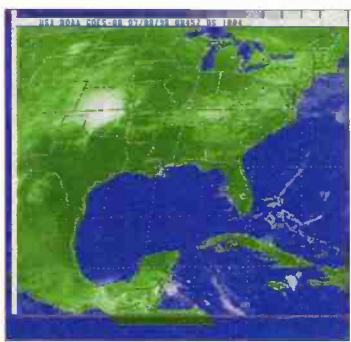


Fig. 3: GOES-8 infra-red image 8 July at 0845UTC direct from GOES-8.

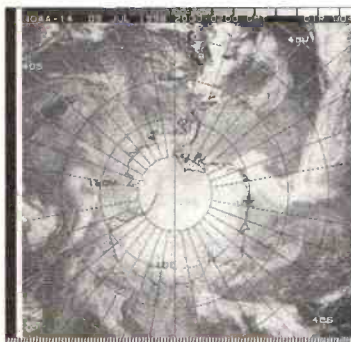


Fig. 4: GOES-8 N14-south-pole on 9 July - composite image.

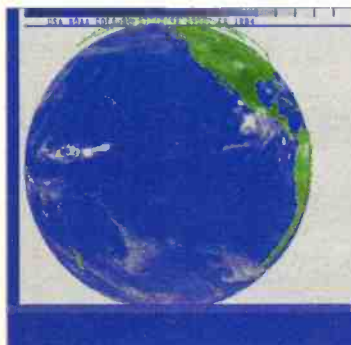


Fig. 5: GOES-9 0900UTC 10 July.

Fig. 6: METEOSAT-5 PDUS image 9 June from Arne van Belle.



is probably closer to the view that would be seen by an orbiting astronaut.

The infra-red image of the south-pole dated 9 July is a composite from a sequence of NOAA-14 passes over that region between 2000 and 0200UTC, re-transmitted from GOES-8 - see Fig. 4. The format is labelled W044 and is transmitted at 0926UTC daily. Think of the potential in building a collection of these images!

I am planning on mounting the Yagi outside permanently so that I can include some GOES-8 (and associated) images in this column occasionally.

GOES-9 Failure

In geostationary orbit above America, three WXSATs - GOES-8, 9 and 10 have been operating (or available). GOES-8 is in the GOES-east position at longitude 74°, and GOES-9 is in the GOES-west position at longitude 134°.

GOES-10 was launched last year and, after checking out, has been kept as an 'in-orbit' spare, in case of failure of either GOES-8 or 9. Well, it happened! On 9 July, the US Department of Commerce's National Oceanic and Atmospheric Administration announced that the GOES-9's attitude control system was near failure, and that GOES-10 was being readied for seamless transfer of operations.

GOES-9 is nearly at the end of its design life. GOES-8 was launched over four years ago and continues to function as the GOES-east WXSAT, with no significant changes in the past 18 months.

Following the announcement of the changeover, GOES-10 imagery is to replace that from GOES-9. I obtained one of the last GOES-9 images - see Fig. 5 - on 10 July within hours of the transfer. As mentioned before, it was obtained from GOES-8 - not the Internet!

METEOSAT-5 WEFAX!

As part of the Indoex (Indian Ocean Experiment), the earlier METEOSAT-5 WXSAT was moved from its former position near longitude 0° (where it was once the prime METEOSAT), to 63° east, over the Indian Ocean. Following several weeks of slow

manoeuvring, it finally arrived in position on 18 May for a series of officially scheduled Primary Data (User) Transmissions (PDUS).

Its main goals are to assess the significance of atmospheric aerosols for global radiative studies, and to assess the

Fig. 7: M5 Indoex 8 July 2100UTC IR1.

magnitude of solar absorption at the surface and in the troposphere, including certain cloud systems. Figure 6 is a METEOSAT-5 Primary Data image received by Arne van Belle of Holland. Arne is the Co-ordinator of Radio Observers for the Werkgroep Kunstmanen organisation, and has recently moved house.

Because of this move, and inclement weather, Arne has only been able to install a 1.2m dish for the Primary Data - hence the noise bursts seen in the image. The picture is a visible-light, maximum resolution image from 1124UTC (slot 22) and shows a storm over eastern India.

The official line on transmissions from METEOSAT-5 is published on the EUMETSAT web site: "Images taken by *Meteosat-5* are disseminated directly from *Meteosat-5* on channel A2 as digital formats only, according to the dissemination schedule S9807101. 1998 onwards."

Until 6 July this 'PDUS-only' policy was evidently in force. Meanwhile, reports from people monitoring WEFAX transmissions in this region had reported that GOMS had apparently ceased regular WEFAX transmissions (on 1691.0MHz) - see GOMS section.

On 8 July Arne van Belle also received a WEFAX transmission - see Fig. 7 - from METEOSAT-5 labelled IR1. The land near the top left side is Madagascar.

My thanks to Arne for sending these images for inclusion here.

GOMS Operations

Those monitoring the GOMS images from METEOSAT-7 will be aware that an image dated 22 May has been transmitted on every GOMS slot for some weeks. Being unable to receive GOMS telemetry from the western UK, I enquired and received confirmation that GOMS WEFAX has not been regularly transmitted by the satellite (also known as ELECTRO) for some time.

Checking the GOMS web site revealed that higher resolution data is still being regularly obtained - see Fig. 8 - so I asked the EUMETSAT METEOSAT operations team for comment. They kindly replied, advising me that although the present GOMS format could not be transferred, they were investigating the situation to try to resolve the problems. "In the meantime it is our policy to disseminate the most recent transferred GOMS formats and plans to disseminate an admin message in their place has been considered not to be a viable option". My thanks to Nicholas Coyne for responding.

Other examples of GOMS near-real-time images can be found at the web site:

<http://smis.iki.rssi.ru/data/goms/archive/>

High Resolution Picture Telemetry

A number of 'Info' correspondents have acquired h.r.p.t. systems, and I am always pleased to hear about their experiences of operating such



precision equipment, and see their resulting images. **Roger Ray** is now running such a system from the German company SSB Electronic and sent me a selection of images - see **Fig. 9**.

To receive h.r.p.t. images, you require a tracking antenna for the 1700MHz band telemetry that has to be driven to follow the satellite across the sky, and a complete signal receiving and processing system. Roger's equipment includes a 650m dish with an active feed, driven by a KR 5600 rotator.

The only problem Roger has not yet solved is how to raise the dish on its tracking bracket - above its

current 1m height. Despite this limitation, Roger sent me half-a-dozen h.r.p.t. images, some others of which may appear in later editions of 'Info'.

Forthcoming 'WXSAT Special'

A 'WXSAT Special' is under preparation for the November edition of *Short Wave Magazine*. Currently scheduled features include reviews of both the RIG (Remote Imaging Group) receiver, and the PROscan receiver from Timestep. Other features should include a look at the next generation LRIT transmissions and h.r.p.t. systems.

Shuttle Launch Schedule

Due to the delay in the availability of the first parts of the modules for the *International Space Station*, there is a pause of a few months before the next Shuttle mission. Currently, STS-95 (*Discovery*) is expected to be launched on 29 October with the Space Hab Single Module and Spartan payloads, and STS-88 (*Endeavour*) is due up on 3 December for the first *ISS-1* (Node-1) flight.

Meanwhile, I am expanding the *Shuttle Pack* to include information on the ISS, which I know is of great interest to many 'Info' readers.

Kepler Elements - MIR and Shuttle

For a print-out of the latest WXSAT elements, *MIR*, and the Shuttle (if in orbit), send a stamped addressed envelope and secured 20p

coin or separate, extra stamp. Transmission frequencies are given for operating satellites. This data originates from NASA. During Shuttle operations I send Kepler elements by return-of-post.

I also send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (secured, plus four self-addressed, stamped envelopes) for four editions.

You can have the 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 50p with your PC-formatted disk and stamped envelope.

Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz.
NOAA-12 (and/or *NOAA-15*) transmits a.p.t. on 137.50MHz.
NOAAs transmit beacon data on 137.77 or 136.77MHz.

METEOR 3-5 uses 137.85MHz during sunlight only.

RESURS signal on 137.23MHz to be clarified.
OKEAN-4 and *SICH-1* use 137.40MHz for short transmissions.

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

GOES-8 (where low on western horizon) uses 1691MHz for WEFAX.

SRC PLANETA GOMS-1 IR WA
11 JUL 1998 03:05 UT

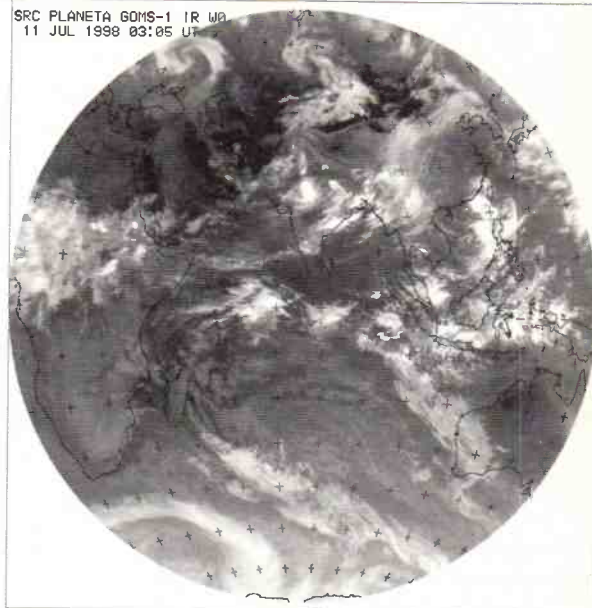


Fig. 8: GOMS high resolution image from 11 July 0305UTC courtesy SRC Planet-A.



Fig. 9: Sweden, NOAA-15 h.r.p.t. on 15 June from Roger Ray.

Stop Press

The new *RESURS-0 1-4* satellite transmitted some a.p.t. images on Monday 13 July, of which **Fig. 10** was actually received by the *RESURS* team themselves. **Olga Tarakanova** of the R&D Centre ScanEx kindly sent this image from the visible-light unit on the satellite. There should be full details of the satellite available for the next issue of *SWM*.



Shackware

Hello and welcome to another instalment of 'ShackWare', the column that details computers (and especially the older boot-sale finds) in the shack. There's lots to cram in this time so without further ado, it's straight on to a bit of useful information to all those who previously, had no good reason to own a palmtop.

Sussex Show Time

I'm putting the finishing touches to this column having only an hour or so ago returned from the Sussex Amateur Radio and Computer show, billed as one of the largest events in the radio calendar. It certainly was well attended - the stalls were four or five deep in bodies and the aisles were full of rain-sodden enthusiasts jostling for bargains, and bargains there were by the bucketful!

Computer equipment at outrageously cheap prices (such as 486DX33 base units for just £25), receivers of all kinds from battered 2m hand-helds at under a tenner to full-blown wide-band base station sets for hundreds of pounds. A stunning bargain on the computer front was a very nice Atari ST in the Bring & Buy hall for just £7 - a shack workhorse at a remarkable price.

All in all then, another good show - though after visiting all those stalls at least twice, can you believe I wasn't able to find a cheap RTTY terminal unit such as an old Maplin TU1000 or some such - anyone able to help?

Hands On

Never mind the Morse 'fist', here's some software that will put c.w. translation right in the palm of your hand (tenuous link). *PalmMorse* is a simple but useful WinCE program which takes words and sentences in standard English or dots and dashes in standard Morse with a translation either way.

There's no transmission option (though that's promised for the future) but nevertheless *PalmMorse* is a very handy pocket translator for those of us whose skill with the dots and dashes is virtually non-existent and yet who have a need to know what it is they're listening to.

Previously, for example, when scouring the long wave section of my HF-225 for maritime beacons, each find would be followed up with some frantic scribbling and searching through tables before I could verify that what I'd found was what I thought I'd found. Now, it's a simple matter of tapping at the keyboard while I listen, then clicking on the translate button.

This is useful even for the relatively simple two-letter callsigns of the beacons, but it really comes into it's own when there's a 'sentence' or more. I'm afraid I have no author information for *PalmMorse* but you'll find a download link for it at **Craig Peacock's Windows CE** web pages (among others) www.craigtech.co.uk

Mail Bag

First on the mat this month is **G D Wilson** of New Basford, Nottingham who writes "I've been given an Atari 520STFM with a colour monitor and second drive. Having to take early retirement on the grounds of ill health, I would like to expand my listening and learn more about decoding. I have a DX-394 with long wire and a.t.u."

The ST is a nice computer. It's easy to use, there's plenty of soft and hardware around at bargain prices

and, while I'd always recommend a PC for those new to computers who haven't yet made a purchase (on the grounds of sheer software numbers), the soon-to-be-launched *FaxCode* from **Dave Miller** is a prime example of quality code for the data modes.

Competently written and at a more than affordable shareware price, *FaxCode* makes use of a simple comparator-like interface (details supplied with the software) which is a suitable build project for anyone with a soldering iron and an hour or two to spare.

Dave E-mailed me recently to say that his software is almost ready to be launched - all that has to be added is the shareware password protection. I'll publicise its arrival as soon as I'm able - which ought to make **Brian Lumsden, L Warren, Peter Clifford** and many other correspondents very happy men!

Another excellent source of ST software is the Walnut Creek CD-ROM available from good PD libraries (including PDSL, a regular *SWM* advertiser). The ROM offers almost 3000 Atari-oriented programs and you don't need a CD drive connected to the ST either. If you have access to a PC with a CD drive (is there a PC without a CD nowadays?), you can browse the ROM and off-load the files you want onto 720K 3.5in disks for use on the ST.

Next out of the hat is this exceedingly interesting letter from **Tony Ward** of Bridgwater, Somerset. Tony was prompted to write following the mention of **David Cripps G7IDB** and his natty pencil-box decode station.

Tony writes that "...mine isn't as small, but it is cheaper! I have a 286 Minisport laptop computer and a Baycom TU both of which cost £30. I use these together with an old CEPT FM Harrier 40-channel CB", and it's with this equipment Tony pursues an interesting (possibly unique, though no doubt someone out there will write and tell me differently) niche in this great s.w.l. hobby of ours. Take it away, Tony...

"The frequencies I listen to are the European packet CB frequencies located on 27.235, 27.245, 27.325 and 27.345MHz, all on f.m. and running at 1200 baud. I have monitored packet beacons containing IDs of the stations and PO box numbers and sometimes even web site addresses and BBS telephone numbers. I have QSLed a lot of these stations mainly from Germany, Denmark and Holland, but I have also monitored packets from as far afield as Switzerland and Greece too. As the sun spot cycle increases over the coming months, I'm sure to get a good collection of QSLs and I must say, the quality of the cards is very good."

Tony believes many of the stations are using Baycom modems with *Graphic Packet* software, vertical antennas and just 4W "...which makes it very QRP in s.w.l. terms". Tony ends "I think I've found quite a niche hobby which is very cheap to do and, as the computer software can be set to monitor with time stamps, is almost 90 per cent automatic. Hope this is interesting to your readers".

Interesting? I'm hooked! I suspect, though, that it isn't especially widespread given the hefty control of data transmissions on 11m and the reduced 'reach' of four watts, though of course some of our European neighbours are a little less concerned than our own authorities.

Interestingly, and after digging a bit deeper on the 'net', it seems that any poll carried out by UK regulating authorities on the matter, found that most CBers don't want data modes on their band. Remarkable! But perhaps it's that very lack of anything technical which attracts enthusiasts away from amateur radio and into CB in the first place?

Return To Lilliput

Sorry! But the mention of portable decoding elsewhere on this page brings me neatly on to a recent acquisition in the field of pencil box stations. The greatest problem has been finding a pocket computer capable of running the necessary software.

Over the years I've experimented with whatever has been available - everything from the Tandy TRS80 shirt pocket computer (essentially a calculator) to the Atari Portfolio, Poqet PC, Psion Series 3 and a HP320LX WinCE machine. None, however, has been a perfect solution. David Cripps mentioned his HP200LX and this, I believed, was probably the best of the palmtops - until now.

On a recent trip to London, I melted my plastic purchasing on what has got to be the most remarkable 'pocket' machine ever. Toshiba's Libretto 50CT set me back around £600 (I know!) but it offers a truly competent spec.

The machine has a Pentium 75MHz processor, 32Mb of RAM and an 810Mb hard drive, a 16-bit fully SoundBlaster compatible sound card, a truly usable keyboard, full compliment of standard I/O ports and, perhaps best of all, a really amazing SVGA screen, all in a package about the size of a VHS video tape.

A downside of all this power is, of course, battery life, which averages around 1.5 hours, but there's an a.c. adapter shipped with the Libretto, little bigger than a box of Swan Vestas, and an optional cigarette lighter adapter for in-car use.

Just drive to the top of your nearest hill with a Sony SW100 receiver, a 12V 137MHz set and fold-down crossed dipole, and the world (and upper atmosphere), shrinks before you! I'm still exploring, but there'll be updates in forthcoming instalments of 'ShackWare'. In the meantime if you happen to bump into my wife, *don't* tell her 'cos she hasn't seen the bill yet! Until next time, good listening...

DX Television

The lengthy reception log for June reflects the vast amount of Sporadic-E activity present every day, perhaps making it something of a record month. Many openings were established as early as 0500UTC with lengthy openings from Italy and the Iberian Peninsula.

There were noticeably fewer signals from Scandinavia, with no reports of Finland. There were many all-day openings similar to the ones which established DXers will remember from the Seventies. **Roger Bunney** (Romsey) recalls such an event when Spanish signals were pounding in.

Arabic Reception

The second-network Syrian Channel E2 transmitter has been logged several times in the United Kingdom during June. **Ian Milton** (Tyne and Wear) and **Paul Logan** (Northern Ireland) have both successfully received the station using a notch filter to remove the spread-over of signals from baby alarms and other r.f. junk operating around Channel R1. On June 2nd, Iranian TV was identified on Channels E2 and E4 in the Netherlands.

On the 3rd, between 1540 and 1620, a mystery signal was located on E2 with French sound and Arabic subtitles followed by *The American Business Programme* at 1650 in English. At 1620, a panel-game show with Arabic subtitles appeared which faded completely by 1632.

Checking out E2 at 1334 on the 19th revealed a strong Arabic caption which lasted for ten minutes before fading. Again, there was no logo but Syria is the prime suspect. It is interesting to note that the L-shape logo in the lower left of the Syrian picture is only present at certain times of the day, notably during the morning, although on the 7th it was present during the afternoon.

Mystery Stations

A second sighting of a mystery station with an oval logo in the top-left of the screen occurred on the 13th at 0820. It was first seen in May carrying Arabic programmes and is possibly the TV6 relay in Turkey. In both cases, the station was co-channelling with Serbia.

We also have an unconfirmed report of this mystery station on E4 with French sound. Talking of which, a Channel E3 station with French audio was logged in Derby at 1052 on June 6th. Could this have been short-skip Sporadic-E from RTBF-1 Liège in Belgium perhaps?

Italian Stations

The private station 'Radio Video' (VIDEO) transmitting

just below E2 seems to come in at the drop of a hat this season, appearing with monotonous regularity in nearly every log! The Italian private station TV Napoli (M NAPOLI) on Channel A has also been a regular visitor this season sporting a distinctive large letter 'M' usually in the top-right of the picture.

On the 25th at 1921, **Peter Barber** (Coventry) noticed colour bars hastily replaced by a 'NAPOLI' caption which was manoeuvred jerkily into place as if using a home slide projector. A brand-new private station on Channel A is thought to be operating but without a logo.

TVA, another private station, which in the past transmitted slightly higher in frequency than Channel A, seems to have disappeared, although this may have merged with, or changed its name to TV Napoli. During some of the openings, **Tim Bucknall** (Congleton) has noted several transmitter offsets, none of which are listed.

Reception Reports

The 18th was the most productive day with an opening into Italy, Corsica and Spain by 0600. By late morning, the Spanish signals receded and stations in Central and south-east Europe began to emerge.

Vince Richardson (Conwy) queried an SF-1 logo on E2 which we can confirm as originating in Switzerland from the 100kW Bantiger outlet a few kilometres east of Bern. Portugal, Germany, Czech Republic, Slovenia, Hungary (RTL KLUB) and Croatia had all been received at some stage by mid afternoon. By 1850, strong signals from Eastern Europe filled the band.

Barry Bowman (Manchester) noticed a football match with France versus Saudi Arabia on R2. A stylised logo in the top-right of the picture resembling a large figure '4' turned out to be Estonian TV from Tallinn. Lithuania (LTV) and the Ukrainian 1st network, both sharing R2, were also showing the same match while over on R1, the 2nd network was presenting the news.

An increase in m.u.f. (maximum usable frequency) brought in TVM Moldova on R3 at 1950. **Simon Hockenull** (Bristol) logged Rumania on this frequency at 2100.

Lithuania has been well received this season, easily identified by the large interlocked LTV logo in the top-left of the picture. **John Woodcock** (Basingstoke) spotted this station broadcasting a gymnastics display on the 23rd.

Peter Barber (Coventry) comments that instead of the normal text pages on the 29th, RUV-Iceland were showing stills of part of a football stadium and scoreboard complete with animated spectators.

Peter Barclay (Sunderland) has spotted a large slanting C-shape logo on E3 during various openings. This sounds very much like Serbia, the C-shaped is actually a satellite dish. Peter says the audio channel

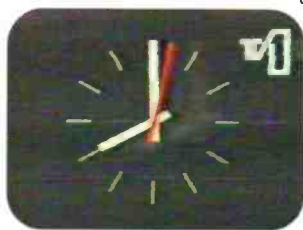


Fig. 1: The Turkish TV-1 clock caption.

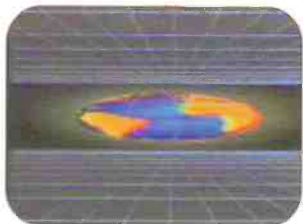


Fig. 2: The Egyptian News opening sequence used by ERTU-2.

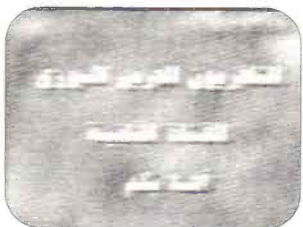


Fig. 3: Unidentified Arabic station received on E2 in Derby on June 9th, 1998.



Fig. 4: Programme caption received from Serbia on Channel E3.



Fig. 5: Unidentified News programme on R1 with identification in the top-left of the screen.

sounds Eastern European and this tends to confirm that the country is indeed Serbia.

Exotics

According to **Pertti Salonen** (Finland), a Finnish DXer identified Kazakhstan TV on Channel R2 during June 8th. The HZ-22 (Aramco TV) E3 outlet at Dhahran, Saudi Arabia, has also been received.

We've also had an unconfirmed report of TVGE Equatorial Guinea being received on E2 in Jersey last April. This was identified at 48.2504MHz using a scanner. The 1kW transmitter sits atop a volcano south of Malabo town.

FM DX

High m.u.f.s provided plenty of f.m. DXing opportunities on at least 13 days. On the 17th, **Mike Gaskin** (Cornwall) reports a possible Canary Islands station (R. Minuto) on 101.40MHz. The m.u.f. rose into the Marine band (156-162MHz) on the 18th and 19th.

Ben Clare (Cleveland) heard a traffic report in Italian from RAI-1 on 94.7MHz from Monte Caccia on his car radio during a recent opening.

The 11th was particularly active between 1800 and 2100UTC with wall-to-wall reception from Spain, Portugal, Italy and Morocco. Many UK stations were wiped off the band!

Service Information

Gösta van der Linden (Rotterdam, Netherlands) has sent the following updates:-

Syria: The 2nd network Channel E2 transmitter at Homs located in the north-west of the country has an e.r.p. of 80kW.

Lebanon: All the 1kW E2 relays have closed. However, there is an E3 transmitter located at Merga Yum beaming towards Beirut. Its e.r.p. is not known.

Romania: A new TVR-1 transmitter is operating on Channel R2.

June DXTV Log

The collective reception log for June has been supplied by Peter Barber (Coventry), Vince Richardson (Dolgarrog, Conwy); Peter Barclay (Sunderland); Simon Hockenhull (Bristol); John Woodcock (Basingstoke) and **Martin Dale** (Stockport). Times are in UTC.

Day	Log
1	Syria (SYR-1) E2 from 0650; Spain (TVE-1) E2 and E3 from 2050; Portugal E2 and E3 from 2055.
2	Italy (RAI UNO) B at 1144; Belarus R2 with G-204 test pattern at 1145; Spain E2, E3 and E4 at 1305, also from 2200; Ukraine (YT-1) with striped '1' logo top-right at 1420.
3	Italy (RAI UNO) A and B; private station (VIDEO) E2 from 0725; Ukraine YT-1 R2 and YT-2 R2 and R3; Norway (NRK-1) from 0922; Lithuania (LTV) R2; Swden (SVT-1) tennis at 0925; Czech Republic (NOVA) R2 at 1050; Hungary (RTL KLUB) R2 at 1330; Serbia (RTS-1) at 1515; Croatia (HRT-1) E4; Unidentified Arabic signals on E2 from 1540; Hungary (RTL KLUB) R2; Estonia (EESTI TV) R2; Rumania (TVR-1) R2; Moldova (TVM) R2; Portugal (RTP-1) E3; Russia (ORT-1) R2.
4	Spain E2, E3 and E4 for most of the day; Portugal E3; France (Canal Plus) L3; Italy (RAI UNO) A; Italy (VIDEO) E2.
5	Spain E2, E3 and E4 for most of the day; Italy (RAI UNO) A; Italy (VIDEO) E2; Portugal E3.
6	Germany (ARD-1) E2; Italy (RAI UNO) A; Italy (VIDEO) E2; Italy (M NAPOLI) A; Unid E3 transmitter with French sound at 1052.
7	Italy (RAI UNO) A; Italy (VIDEO) E2; Czech Republic (NOVA) R1; Russia (RTV) R2; Spain E3; Syria (SYR-2) E2 from 1252 until 1452.
9	Italy (RAI UNO) A and B; Italy (VIDEO) E2; Norway (NRK-1) E2; Slovenia (SLO-1) E3; Hungary (RTL KLUB) R2.
10	Italy (RAI UNO) A; Italy (VIDEO) E2; Hungary (RTL KLUB) R2; Serbia E3.
11	Spain E2, E3 and E4 from 1745; Portugal E3 and E4 (35W relay at Valenca do Duro); f.m. band active until 2100 with Spain, Morocco, Italy and Portugal.
12	Italy (RAI UNO) A and B; Italy (VIDEO) E2; Unidentified private station on Channel A; Corsica (Canal Plus) L2 and L4.
13	Corsica (HRT-1) E4; Turkey (possibly TV6) wit oval logo top-left from the SE at 0820; Serbia (RTS-1) E3; Slovenia (SLO-1) E3; Italy (VIDEO) E2; Italy (RAI UNO) A and B; Also unidentified private station on Channel A.
14	Spain E2 and E4; Portugal E3.
15	Italy (M NAPOLI) A; Spain E2; Norway E2; Lithuania R2.
16	Spain E2, E3 and E4; Portugal E3; Norway E4; Italy (RAI UNO) A and B; Italy (VIDEO) E2.
17	Italy (RAI UNO) A and B; Italy (VIDEO) E2; Italy (M NAPOLI) A; Corsica (Canal Plus) L2.
18	Italy (RAI UNO) A and B; Italy (VIDEO) E2; Italy (M NAPOLI) A; Corsica (Canal Plus) L2; Spain E2 and E3; Portugal E3; Czech Republic (NOVA) R1; Germany E2; Switzerland (SF-1) E2; Hungary (RTL KLUB) R2; Slovenia E3; Croatia E4; Portugal E3 and E4; Estonia (EESTI TV) R2; Serbia E3; Moldova (TVM) R2 and R3; Ukraine (YT-1) R1, YT-2 R1; Lithuania (LTV) R2; Sweden E2.
19	Italy (RAI UNO) A and B; Italy (VIDEO) E2; Italy (M NAPOLI) A; Slovenia E3; Serbia E3; Corsica L2 and L4; Hungary (RTL KLUB) R2; Moldova (TVM) R2; Rumania (TVR-1) R2; Unidentified Arabic caption until 1335; Spain E2; Ukraine (YT- 2) R2.
20	Italy (RAI UNO) A and B; Spain E2 and E3; Portugal E2; Estonia R2.
21	Italy (RAI UNO) A and B; Italy (VIDEO) E2; Italy (M NAPOLI) A; Corsica L2; Spain E2, E3 and E4; Portugal (RTP-1) E3 and E4; Portugal (RTP-2) E2.
22	Italy (RAI UNO) A; Italy (VIDEO) E2; Serbia E3; Spain E2, E3 and E4; Portugal E3.
23	Italy (RAI UNO) A and B; Italy (VIDEO) E2; Italy (M NAPOLI) A; Moldova R2; Serbia E3; Hungary (RTL KLUB) R2; Lithuania R2; Ukraine (YT-1) R1 and R2; Slovenia E3; Switzerland E2; Russia ORT-1) R3.
24	Spain E3; Italy (RAI UNO) A and B; Italy (VIDEO) E2.
25	Italy (RAI UNO) A and B; Italy (VIDEO) E2; Italy (M NAPOLI) A.
26	Italy (RAI UNO) A and B; Italy (VIDEO) E2; Italy (M NAPOLI) A; Spain E2 and E4; Hungary (RTL KLUB) R2; Slovenia E3; Germany E2; Austria (ORF-1) E4; Czech Republic (NOVA) R1 and R2; Portugal E3; Serbia E3. Lithuania R2; Denmark (DR-TV) E3; Spain E2 and E4; Portugal E3; Belarus R2.
27	Italy (RAI UNO) A; Spain E3; Hungary (MTV-1) R1; Hungary (RTL KLUB) R2; Czech Republic (NOVA) R2.
28	Italy (RAI UNO) A; Spain E3; Hungary (MTV-1) R1; Hungary (RTL KLUB) R2; Czech Republic (NOVA) R2.
29	Iceland (RUV) E4.
30	Spain E2, E3 and E4.



Italy: Private stations 'Radio Video' (VIDEO) and 'TV Napoli' (M NAPOLI) both transmit from Monte Faito.

TV Up For Grabs

Ernie Strong (Cambridgeshire) has a Saisho CT141X portable colour receiver for disposal, free of charge but collection preferred. It is in reasonable working order but it is possibly u.h.f. only. If anyone is interested please act now, otherwise Ernie will throw it out! Enquiries should be made via the address at the end of the column, please enclose a stamp so that your letter can be forwarded to Ernie.

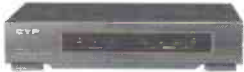
Keep On Writing!

Please send your DXTV and f.m. reception reports, off-screen photos, news and information to arrive by the first of the month to:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS.**

Fig. 6: This month's 'Down Memory Lane' feature. The ETP-1 test card used in the early Eighties by Channel 4.

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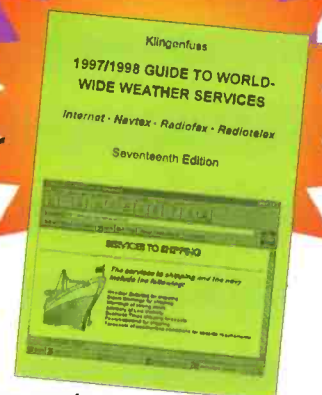
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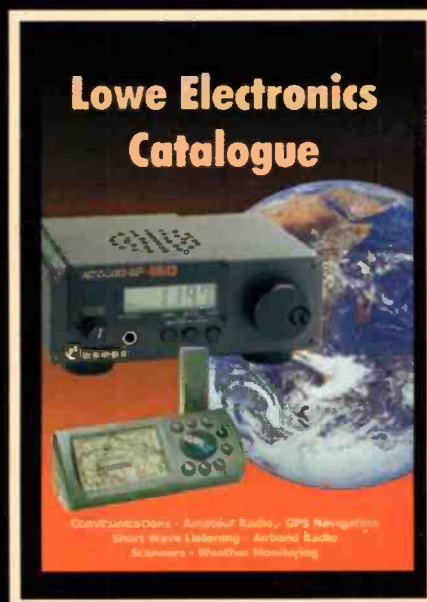
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World-Wide Radio Guide

International Radio
Programmes in English
from the leading world
broadcasters
and how to hear them

Compiled for
Short Wave Magazine by

The Association for
International Broadcasting

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AOR AR3000.....	£Call
Icom ICR-8500.....	£1199.00
Yaesu FRG-100.....	£489.99
Icom PCR-1000.....	£Call

WELCOME

to the WORLD-WIDE RADIO GUIDE



Suddenly, it's all happened. With the rush to market on the Internet, hundreds of radio stations have found that they can get themselves heard all over the world, just for the cost of an Internet site, and a little bit of software.

So what does 'international radio' mean now? One way of cutting the cake is in two slices:

- The classic international radio station, broadcasting about its own country to all the other countries of the world. Its programmes are designed for an overseas audience, and targeted abroad.
- Stations with programmes designed for audiences in their own countries, but which can now be heard abroad. Many keen radio enthusiasts have made it their business to track down these stations on radio in the past. Now, more and more domestic stations have put themselves on the Internet and on satellite, and can be heard world-wide.

The magic of making your way across the world by short wave radio is still very potent, but the scene has changed. Not only have many international broadcasters set up web sites and provided audio on the Internet, many of them make the audio available 'on-demand', giving you the sound when you want it, not when the broadcasters say you have to listen.

Programmes are often available on satellite, too,

with listeners picking up the signals direct, or hearing them relayed via cable systems or local radio stations.

In the *World-Wide Radio Guide*, we have broken new ground by including not only the familiar short, medium and long wave frequencies, we have given satellite and Internet details, and contact information - telephone, FAX, E-mail and web site.

But what is really different about this Guide is that we have included something which is very rare - information about the programmes. The broadcasters want you to listen to what they have to say. It is hard enough to track down the transmissions, because of the complicated technical schedules. As for knowing what's going to be on the air - where do you find it?

The answer is here in the *World-Wide Radio Guide*, where for some of the major broadcasters, we have included programme schedules alongside the technical information. This is a step in the right direction, and we hope that you will find this new approach useful.

Tom Walters

Association for International Broadcasting

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Pull-out booklet supplied free with *Short Wave Magazine*, September 1998 issue.

HOW TO USE THE WORLD-WIDE RADIO GUIDE

All times are given in UTC, which is the same, for practical purposes, as GMT. The areas to which it is expected programmes will reach are sometimes abbreviated for reasons of space, as are programme titles.

Radio

All frequencies in this *World-Wide Radio Guide*, are in kilohertz. The experienced listener will of course know that if you need the frequency in megahertz, you pop in a decimal point, three figures from the right. So 12095kHz is 12.095MHz.

Many radios still group the frequencies in metre bands, which is likely to give beginners a headache, because as frequency increases, the wavelength (in metres) goes down. Here are two quick reference guides:

metre band	49	41	31	25	21	19	16	13
kilohertz	6000	7100	9500	11600	13600	15100	17500	21700
megahertz	6	7	9	11	13	15	17	21

The International Frequency Spectrum

	Usual abbreviation	Approximate frequency range (kHz)	Distance covered (km)
Long wave	l.w.	150-250	up to 5000
Medium wave	m.w./a.m.	500-1500	200-5000
Short wave	s.w.	3000-30000	world-wide
FM/VHF	f.m./v.h.f.	90-100	up to 50

Where frequencies are in the medium or long wave bands, we show ^{mw} or ^{lw} immediately after the kilohertz figure e.g. 1413^{mw} is a medium wave frequency, and 198^{lw} is a long wave frequency.

For beginners, the a.m. band is another name for the medium wave band. As the more knowledgeable will point out, broadcasts in all three main bands - short, medium and long are in fact all the a.m. type of transmission, but the medium wave band has got stuck with the a.m. label.

Transmission on short wave is almost as much an art as a science. Engineers can only hope that their predictions will work out, because sometimes after very careful calculation, a frequency will fail altogether to reach a target area, while a frequency will get there which was meant for another area altogether. In addition, a frequency engineer's hair is likely to turn prematurely white because the effectiveness of all frequencies varies on a day-to-day basis.

We have given all the frequencies that are 'on' at each given time. Try all the frequencies to find which work best, and also try frequencies intended for other areas. Remember that over weeks and months, the patterns which worked for you at first may need revising as atmospheric conditions (and stations' schedules) change.

Satellite & Internet

If you have satellite equipment, we have included tuning information for those stations where we have given programme content. If you have a multimedia computer, and you were not already aware of the Internet radio explosion, then you are in for a real white-knuckle ride as you go surfing the hundreds of radio sites. We have given you just an inkling here. For a real humdinger of a radio roller coaster Internet trip, go to:

- World Radio Network on www.wrn.org WRN is a pioneer distributor of international radio by satellite and Internet. The station is a gateway to a huge range of world-wide listening.
- The AIB on www.aibcast.demon.co.uk The AIB is a co-operative forum for everyone engaged in international broadcasting, and leads you to many stations and organisations that can expand your listening experience.

We hope that the detailed information in *World-Wide Radio Guide* will be easy to follow, and that it will help you to get more successful international listening, with a wider choice and awareness of the hundreds of programmes that are there for the finding.

Tom Walters AIB

AUSTRIA: RADIO AUSTRIA INTERNATIONAL

Radio Austria International, A-1136, Vienna, Austria

Telephone: +43 1 87878 3636

FAX: +43 1 87878 4404

E-mail: roi@orf.at

Internet: www.orf.at/roi/UK_home.htm



Frequencies:

0030-0100	Americas	9655
0230-0300	Americas	9655, 9870, 13730
0430-0500	Eur	6155, 13730
0530-0600	Americas	6015
0730-0800	Eur, ME	6155, 13730, 15410, 17870
0930-1000	As, Australia	15455, 17870
1230-1300	Eur, Americas	6155, 13730
1630-1700	Eur, Af, As	6155, 11855, 13710, 13730
2130-2200	Eur, Af	1476 ^{mW} , 5945, 6155, 13730

The Austrian Broadcasting Corporation Centre.



Areas:

Af	Africa
As	Asia
Eur	Europe
ME	Middle East



Station Director, Prof. Paul Lendvai.

The steerable curtain antenna at Moosbruun.



AUSTRALIA: RADIO AUSTRALIA

Radio Australia, GPO Box 428G, Melbourne 3001, Victoria, Australia

Telephone: +61 3 9626 1800

FAX: +61 3 9629 1899

E-mail: ruast3@ozemail.com.au

Internet: www.abc.net.au/ra



Frequencies:

Time	Frequencies	Time	Frequencies
0000-0500	17750	1400-1800	5995
0000-0800	15240	1430-1700	11660
0900-1200	6080	1430-2130	9500
0100-0500	15415	1700-2200	11880
0200-0900	21820	1800-2000	6080, 7240
0200-0900	15510	1800-2000	7240
0600-0900	15415	1800-2100	9660
0600-1100	17750	2000-2200	12080
0800-0900	5995, 9710	2100-0200	21740
0800-1200	9770	2100-0800	17715
0800-1200	9770	2100-0800	17715
0900-1100	11880	2100-2200	7240, 9660
0900-1200	6080	2100-2200	7240
1200-1400	5995, 6020	2200-0200	17795
1200-1400	6020	2300-0800	9660
1200-1800	6080	2300-0900	12080
1200-2100	9580		

BELGIUM: RADIO VLAANDEREN INTERNATIONAL

Radio Vlaanderen International, PO Box 26, B-1000 Brussels, Belgium

Telephone: +32 2 741 3807

FAX: +32 2 741 3807

E-mail: rvi@vrt.be

Internet: www.brtn.be/rvi/

Programmes on short and medium wave:

Time	Area	Mon	Tue	Wed	Thu
0730-0800	Europe, Australia	PR, B, T, AT	PR, BT, FE, S	PR, BT, A, AT	PR, BT, A, AT
1030-1100	Europe	PR, B, T, AT	PR, BT, FE, S	PR, BT, A, AT	PR, BT, A, AT
1230-1300	North America	PR, B, T, AT	PR, BT, FE, S	PR, BT, A, AT	PR, BT, A, AT
1630-1700	Europe	PR, BT, FE, S	PR, BT, RS, GS	PR, BT, A, AT	PR, BT, E, IR
1730-1800	Africa	PR, BT, FE, S	PR, BT, RS, GS	PR, BT, A, AT	PR, BT, E, IR
2000-2030	Europe	PR, BT, FE, S	PR, BT, RS, GS	PR, BT, A, AT	PR, BT, E, IR

Every programme segment includes News.

CANADA: RADIO CANADA INTERNATIONAL

Radio Canada International, PO Box 6000, Montreal HC3 3A8, Canada

Telephone: +1 514 597 7555

FAX: +1 514 284 0891

E-mail: rci@montreal.src.ca

Internet: www.rcinet.ca



Programmes on short wave:

Time	Area	Mon	Tue	Wed	Thu
0100-0200	Am	AC, M	S	S	S
0200-0230 (to 0300 Sunday-Manday)	Am	T	S	S	S
0400-0430	ME	M	S	S	S
0500-0600(Tue) (to 0530 Wed-Sat)	Eur, ME, Af	-	VC	S	S
1200-1230	Asia	S	S	S	S
1200-1300 (to 1400 Mon-Fri)	Am	TM	TM	TM	TM
1300-1600 (Sun only)	Am	-	-	-	-
1330-1400	Eur, Af, ME, Asia	S	S	S	S
1630-1700	As	S	S	S	S
2000-2130	Eur, ME, Af	S	S	S	S
2100-2130	ME	W6	W6	W6	W6
2200-2230	Am, As	W6	W6	W6	W6
2230-0000	USA, Caribbean	-	-	-	-
2300-2330	Latin America	W6	W6	W6	W6
2300-0000	Latin America	-	-	-	-
2230-2300	Americas	AH C	AH	-	AH

All programmes begin with News.

Areas:

Af Africa
As Asia
Am Americas

Satellite:

Many of Radio Canada International's programmes can be heard on: *Hot Bird* Eutelsat II -F6 at 13°E, 11.265GHz (Channel 3) Horizontal, audio 7.56MHz. Regions: Europe, Middle East, Northern Africa.

Internet:

Several programmes can be heard directly from Canada (www.rcinet.ca), and some RCI programmes are available via World Radio Network (www.wrn.org)

Programme Key:

A	The Arts
AT	Around Town
BT	Belgium Today
E	Economics
FE	Focus on Europe
GS	Green Society
IR	International Report

MF	Music from Flanders
P	PO Box 26
PR	Press Review
RS	Rockspot
RW	Radio World
S	Sports
T	Tourism



Satellite:

Astra 1D 19.2°E, Channel 58 (BSkyB) 10.847GHz vertical, audio 7.74MHz
Also on World Radio Network

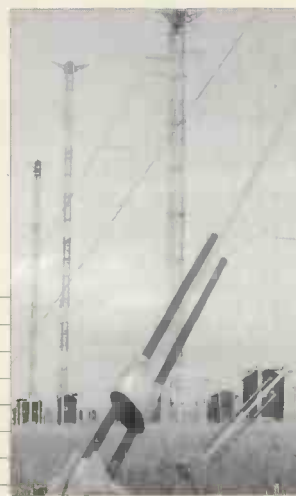
Internet:

Radio Vlaanderen International is available on the Internet via World Radio Network (www.wrn.org)

Fri	Sat	Sun	Frequencies
PR, BT, E, IR	PR, MF	RW, PO	7290, 9940
PR, BT, E, IR	PR, MF	RW, PO	9925, 15535
PR, BT, E, IR	PR, MF	RW, PO	15545
PR, BT, A, T	-	-	5910, 7290
PR, BT, A, T	-	-	17655, 11810
PR, BT, A, T	-	-	1512 ^{mw}



RCI's transmitter site at Sackville, New Brunswick, in the Atlantic Provinces.



RCI



RADIO CANADA INTERNATIONAL

Fri	Sat	Sun	Frequencies
S	S	S, VC, EW	5960, 9535, 9755, 11715, 13670
S	S	V, SC, S	9635, 9755, 11715, 13670
S	S	VC	9715, 11835, 11975
S	S	S	7295, 9595, 11835, 15430
S	EW	AC	9660, 15195
TM	TH	CQ	9640, 11855, 13650
-	-	TM, SM	11855, 13650
S	VC	M	9535, 11935, 11795, 15325, 17820
S	VC	M	6140, 7150
S	VC EW	AC M	5995, 7325, 11690, 13650, 13670, 15150, 15325, 17820, 17870
W6	SCS	IT	7325, 11690, 11890, 13650, 13670, 15150, 15325, 17820
W6	WW	WW	5960, 9755, 13670, 15305
-	MP	AH, C	5960, 9755, 13670
W6	-	-	11895, 15305
-	CQ	SA	5960, 9755, 11895, 13670, 15305
-	MP	SA	5960, 9755, 13670, 15305

Programme Key:

AC	The Arts in Canada
AH	As It Happens
C	Connections
CQ	Classic Quirks
EW	Earth Watch
IT	The Inside Track

M	The Mailbag
MP	The Mystery Project
S	Spectrum
SA	Sound Advice
SCS	A Summer Comedy Summary
SM	Some of the Best Minds of Our Times
T	Tapestry
TB	Talking Books

TH	The House
TM	This Morning
V	The Vestibules
VC	Venture Canada
VC	Vinyl Café
W6	The World at Six
WW	The World This Weekend

FINLAND: YLE RADIO FINLAND

YLE Radio Finland, Box 78, 00024 Helsinki, Finland

Telephone: +358 9 1480 4333

FAX: +358 9 148 1169

E-mail: rfinland@yle.fi

Internet: www.yle.fi/rfinland



Frequencies:

Time	Area	Frequencies
0200-0230	Europe, America	558 ^{mw} , 9780, 11900
0630-0700	Europe, Asia, Australia	558 ^{mw} , 11945, 17830
2000-2030	Europe, Africa	558 ^{mw} , 963 ^{mw} , 6135

GERMANY: DEUTSCHE WELLE

Deutsche Welle, PO Box 100 444, D-50968, Cologne, Germany

Telephone: +49 221 3890

FAX: +49 221 389 4155

E-mail: online@dwelle.de

Internet: www.dwelle.de/english



Programmes on short and medium wave:

Time	Area	Mon	Tue	Wed	Thu	Fri	Sat
0100-0150	North America	MB, AA	ME	IN	LG	SP	GR
0200-0250	South Asia	SU, MM	ME	IN	LG	SP	GR
0300-0500	North America	RS, AA	ME	IN	LG	SP	GR
0400-0450	Africa, Middle East	SU, MM	GMA	GMA	GMA	GMA	GR
0500-0550	North America	MB, C	ME	IN	LG	SP	GR
0600-0650	West Africa	SU, MM	GMA	GMA	GMA	GMA	GR
0900-0950	Africa, Middle East	DF	ME	IN	LG	SP	TP, AFK
0900-0950	Asia, Pacific,	APR	APR	APR	APR	APR	TP, MM
1100-1150	West Africa	AFR	AFR	AFR	AFR	AFR	TP, AFK
1600-1650	Africa, Middle East	AFR	AFR	AFR	AFR	AFR	TP, S
1600-1650	South Asia	APD	APR	APR	APR	APR	TP, S
1900-1950	West Africa	AFR	AFR	AFR	AFR	AFR	TP, S
2000-2050	Europe	GR, F	ME, F	IN F	LG F	SP, F	SA, AA, F
2100-2150	Asia, Pacific, West Africa	DF	ME	IN	LG	SP	SA, MB
2300-2350	East Asia	DF	ME	IN	LG	SP	SA, MB

Deutsche Welle carries News in each segment, and in most segments it also carries *Newslink*. Fre

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FRANCE: RADIO FRANCE INTERNATIONALE

Radio France Internationale, BP 9516, F-75016 Paris, France

Telephone: +33 1 42 30 30 62

FAX: +33 1 42 3 0 26 74

E-mail: english.service@rfi.fr

Internet: www.rfi.fr

Frequencies:

Areas:

Af Africa
As Asia
Eur Europe
ME Middle East

Time	Areas	Frequencies
1200-1300	All areas	9805, 11600, 15155, 15195, 15530, 15540, 17575
1400-1500	ME, Af, As, Australia	11910, 15405, 17560
1600-1700	Eur, ME, Af	11615, 11705, 12015, 15210, 15640, 17850

Programme Key:

AFK	African Kaleidoscope	GMA	Good Morning Africa	S	Spectrum
AA	Arts on the Air	GR	German by Radio	SA	Saturday Review
APD	Asia Pacific Report Development	IE	Inside Europe	SP	Spotlight on Sport
APR	Asia Pacific Report	IN	Insight	SU	Sunday Review
AFR	Africa Report	LG	Living in Germany	TP	Talking Point
C	Cool	MB	Mailbag	WK	Weekend
DF	Development Forum	ME	Man and Environment		
F	Frequencies	MM	Marks and Markets		
		RS	Religion and Society		

Sun	Frequencies
SA, IE	6040, 6085, 6145, 11810
SA, MB	1548 ^{MW} , 7285, 9615, 9690, 11945, 11965, 12045
SA, S	6085, 6145, 6185, 9535, 9640
SA, IE	5990, 6015, 7225, 9565, 11765
SA, MM	6045, 6185, 9615, 11810
SA, IE	11915, 13790, 15185, 17820, 17860, 21680
RS, C	9565, 15205, 15410, 17800, 21600
RS, C	6160, 12055, 17560, 21680
RS, C	15370, 15410, 17765, 17800
RS, AA	7130, 9735, 11810, 21695
RS, C	1548 ^{MW} , 6170, 7225, 9875, 15415
RS, AA	9640, 9670, 11785, 11810, 13790, 15245, 15390
SU, AA, F	9615
SU, AA	7115, 9670, 9735, 9765, 11785, 11865, 15135
SA, AA	5975, 6090, 7325, 9815

Internet:
Many of Deutsche Welle's programmes can be heard on the Internet. Go to:
www.dwelle.de/english/audio.html

ency information is given in every segment.

Short Wave Magazine
catering for all your listening needs.

JAPAN: NHK WORLD RADIO JAPAN

Radio Japan, NHK World, 2-2-1 Jinnan, Shibuya-ku, Tokyo 150-01, Japan

Telephone: +81 3 3465 1111

FAX: +81 3 3481 1350

E-mail: info@intl.nhk.or.jp

Internet: www.nhk.or.jp/rjnet/



Programmes on short wave:

Time	Area	Mon	Tue	Wed	Thu	Fri	Sat
0000	Eur, Afr, SEAs, NAm	44	44	44	44	44	AW
0100	ME, As, SAs, SE As, Oc, H, SAm	44	44	44	44	44	W
0300	SE As, Oc, CAm	AT, MR	AT, E	AT, MR	AT, MJ	AT, MB	W
0500	Eur, As, SEAs, Oc, Nam, H	44	44	44	44	44	H
0600	Eur, As, SEAs, Oc	AT, MR	AT, E	AT, MR	AT, MJ	AT, MB	AW
1000	As, SEAs	44	44	44	44	44	H
1100	As, SEAs, Oc, NAm	AT, MR	AT, E	AT, MR	AT, MJ	AT, MB	AW
1400	SAs, ME, Nam	44	44	44	44	44	W
1500	As, SAs, SEAs, NA	AT, MR	AT, E	AT, MR	AT, MJ	AT, MB	AW
1700	Eur, Afr, As, SEAs, Nam	44	44	44	44	44	H
2100	Eur, Oc	AT, MR	AT, E	AT, MR	AT, MJ	AT, MB	H

NETHERLANDS: RADIO NETHERLANDS

Radio Netherlands, PO Box 222, 1200 Hilversum, Netherlands

Telephone: +31 35 672 4211

FAX: +31 35 672 4207

E-mail: letters@rnw.nl

Internet: www.rnw.nl/rnw



Programmes on short and medium wave radio, and on satellite:

Time	Area (Radio)	Satellite No	Area (Satellite)	Mon	Tue	Wed	Thu
0030	NAm	1	Eur, ME	SY, SI	RF	M5	DO
0030	SAs	1,2,6,8	Eur, ME, Afr, As, Pac	SY, SI, FM	RF, PI	M5, PI	DO, PI
0130	SAs	2,6,8	Eur, Afr, AS, Pac	WA, SS, FM	AT, PI	GL, PI	SI, PI
0230	SAs	2,6,8	Eur, Afr, AS, Pac	SY, SI	RF	M5	DO
0430	NAm	1,2,6,8	Eur, ME, Afr, As, Pac	SY, SI	RF	M5	DO
0730	Pac	2	Eur	RF, IN	M5, IN	DO, IN	MN, IN
0830	Pac	2	Eur	AT	GL	SI	RF
0930	FE, SEAs	-	-	RF, PR	M5, PR	DO, PR	MN, PR
1030	FE, SEAs	2	Eur	AT	GL	SI	RF
1030	Eur	2	Eur	AT, PR	GL, PR	SI, PR	RF, PR
1130	Eur	2	Eur	RF	M5	DO	MN
1330	SAs	-	-	RF, PR	M5, PR	DO, PR	MN, PR
1430	SAs	2 (not Sun)	Eur	AT	GL	SI	RF
1730	Af	-	-	RF, PR	M5, PR	DO, PR	MN, PR
1830	Af	1,2,6,8	Eur, ME, Afr, As, Pac	AT, PR	GL, PR	SI, PR	RF, PR
1930	Af	1,2,6,8	Eur, ME, Afr, As, Pac	RF	M5	DO	MN
2030	Eur	2	Eur	RF, PR	GL, PR	DO, PR	MN, PR
2130	Eur	2	Eur	AT	M5	SI	RF
2330	Nam	1	Eur, ME	AT, PR	GL, PR	SI, PR	RF, PR

Areas:	FE	Far East	SAs	South Asia	
Af	Africa	ME	Middle East	SEAs	South-East Asia
As	Asia	NAm	North America		
Eur	Europe	Pac	Pacific		

All programme segments are of 55 minutes duration: all begin with News, and most include Newslite

Programme Key:

44	44 Minutes
AT	Asian Top News
AW	Asian Weekly
E	Enjoy Japanese
H	Hella from Tokyo

MB

MJ

MR

W

Music Beat

My Japan Diary

Music Reflections

Weekend Break

Sun	Frequencies
H	6155, 6180, 9665, 11705, 11815 (to 0015), 13650 (to 0015)
H	6150, 11860, 11880, 15570, 15590, 17810, 17835, 21610, 21670
H	17685, 17825, 17885
W	6110, 7230, 9835, 11760, 11715, 11840, 11850, 15230, 17810
H	5975, 7230, 11740, 11840, 11850, 17810
W	9695, 11730
H	9505, 9695, 11730, 11850
AW	9505, 11730, 11880
H	7200, 9505, 9750, 11730
W	6090, 7110, 9535, 9825, 15355
AW	6035, 9725, 11850

Areas:

Afr	Africa
As	Asia
CAM	Central America
Eur	Europe
H	Hawaii
ME	Middle East
NAM	North America
Oc	Oceania
SAM	South America
SAs	South Asia
SEAs	South East Asia

Radio Japan carries
News on the hour.

Satellite:

RNW has a complicated satellite schedule. Contact the station via Internet, or other means for full information. Here are some details:

Mono service to Europe is on *Hot Bird* Eutelsat II F6, 13°E, transponder 11.431GHz horizontal polarisation (POLSAT), audio 7.56MHz

Digital service is an *Astra 1G* 19°E, transponder 109 horizontal polarisation, choose from audio channels RNW-1 and RNW-2

Internet:

RNW can be heard on World Radio Network (www.wrn.org)

Fri	Sat	Sun	Frequencies
MN	OL	WE	6020, 6165, 9845
MN, PI	GL, PR	WE, IN	9855, 11655, 12090
RF, PI	DO, PR	RS, IN	9855, 11655, 12090
MN	GL	WE, FM	9855, 11655
MN	OL	WE	6165, 9590
GL, IN	WE, IN	SY, SI, FM	9720, 9820
DO	RS	WA, SS	9720, 9820
GL, PR	WE, IN	SY, SI, FM	12065, 13710
DO	RS	WA, SS	12065, 13710
DO, PR	RS, IN	WA, SS, FM	6045, 9860
GL	WE	SY, SI	6045, 9860
GL, PR	WE, IN	SY, SI, FM	9890, 15585
DO	RS	WA, SS	9890, 15885
GL, PR	WE, IN	SY, SI, FM	6020, 7120, 11655
DO, PR	RS, IN	WA, SS, FM	6020, 7120, 9895, 11655, 15315, 17605
GL	WE	SY, SI	6020, 7120, 9895, 11655, 15315, 17605
RS, PR	WE, IN	SY, SI, FM	1512 ^{mw}
DO	RS	WA, SS	1512 ^{mw}
DO, PR	RS, IN	WA, SS, M	6020, 6165, 9845

Programme Key:

AT	Aural Tapestry
DO	Documentary
FM	Four Minutes
IF	Info
IN	Insight
M5	Music 52/15
MN	Media Network
PI	Programme Info
PR	Press Review
RF	Research File
RS	Roughly Speaking
SI	Sounds Interesting
SS	Siren Song
SY	Sincerely Yours
WA	Wide Angle
WE	Weekend

RUSSIA: THE VOICE OF RUSSIA

The Voice of Russia, Pyatnitskaya 25, Moscow 113326, Russia

Telephone: +7 095 950 5801/6631

FAX: +7 095 230 2828

E-mail: letters@vor.ru

Internet: www.vor.ru



РАДИО ГОЛОС РОССИИ
RADIO VOICE OF RUSSIA

Programmes on short and medium wave:

Time	Area	Mon	Tue	Wed	Thu	Fri	Sat	Sun
0100	Americas	MMU	UPFB	UPJS	UPYFA	UPMYR	UPMYT	MMU
			FB	JS	YFA	YR	YT	
0200	Americas	MMB	SE	NM	MMB	SE	NM	MMB
0230	Americas	TL	KL	TR	MYT	RR	ABC	TW
0300	Americas	SE	NV	NV	NV	NV	NV	NV
0330	Americas	ABC	AP	AP	AP	AP	AP	CMM
0400	Americas	PA	MMB	SE	NM	MMB	SE	PA
0430	Americas	JS	YFA	MYR	FB	TR	TL	MYT
0500	Europe, Asia	MMB	FAP	FAP	FAP	FAP	FAP	SE
	Australasia							
0530	Europe, Asia	TR	MYR	RR	MYT	TR	CMM	ABC
	Australasia							
0600	Europe, Asia	SE	MMB	NM	MMB	SE	NM	MMB
	Australasia							
0630	Europe, Asia	RR	KL	MYT	ABC	KL	TR	RR
	Australasia							
0700	Europe, Asia,	MMU	UP	SE	UP	MMB	UP	PA
	Australasia							
0730	Europe, Asia	MMU	FB	ABC	TR	MYT	KL	TW
0800	Europe, Asia	SE	FA	UP	NM	UP	MMB	MMU
0830	Europe, Asia	MYT	MMB	TR	FB	JS	CMM	MMU
1400	Asia	NV	NV	NV	NV	NV	NV	SP
1430	Asia	FB	MYR	JS	YFA	MYT	TL	KL
1500	Middle East	FAP	FAP	FAP	FAP	FAP	NM	PA
1530	Middle East	TR	MYT	ABC	FB	TW	KL	RR
1600	Middle East	NM	SE	MMB	NM	MMB	MM	SE TL
1630	Middle East	AP	AP	AP	AP	AP	MM	SE TL
1700	Europe, Africa	NV	NV	NV	NV	NV	NV	SP
1730	Europe, Africa	KL	YFA	MYT	MYR	FB	TW	TR
1800	Europe, Africa	UP	UP	UP	UP	UP	PA	PA
1830	Europe, Africa	AP	AP	AP	AP	AP	TR	CMM
1900	Europe, Africa	MMB	NM	SE	MMB	NM	SE	MM
1930	Europe, Africa	MYT	TR	KL	ABC	RR	CMM	MM
2000	Europe, Africa	SE	MMB	NM	SE	MMB	NM	SP
2030	Europe, Africa	TW	YFA	MYR	FB	JS	RR	TL

News is broadcast on the hour, with *News in Brief* on the half-hour. All programme segments are 3

Programme key:

ABC	Audio Book Club	MM	Music and Musicians	TW	Your Top Tune/You Write to Moscow
AP	Alternative Programmes	MYR	Music at Your Request	UP	Update
CMM	Christian Message from Moscow	MYT	Moscow Yesterday and Today	YFA	Yours for the Asking
FA	Focus on Asia	NV	News and Views		
FAP	Focus on Asia and the Pacific	NW	Newmarket		
FB	Folk Box	PA	Programme Announcements		
JS	Jazz Show	RR	Russian by Radio		
KL	Kaleidoscope	SE	Science and Engineering		
MMB	Moscow Mailbag	SP	Sunday Panorama		
		TL	Timelines		
		TR	This is Russia		

Satellite:

Horizont 40°E, 3.675GHz circular polarisation right-hand, audio 7.92MHz. Carries English throughout the 24 hours, except 0100-0200, and 1700-1800, which are in Russian.

Internet:

VOR can be heard on World Radio Network (www.wrn.org)

Frequencies

9615, 9665, 12050, 15520

9615, 9665, 12050, 15520

9615, 9665, 12050, 15520

7125, 9615, 9665, 11980, 12000, 12050, 13640, 13665, 15180, 15455

7125, 9615, 9665, 11980, 12000, 12050, 13640, 13665, 15180, 15455

7125, 9615, 9665, 11980, 12000, 12050, 13645, 13665, 15180, 15455, 15595

7125, 9615, 9665, 11980, 12000, 12050, 13645, 13665, 15180, 15455, 15595

1323^{mw}, 1386^{mw}, 9450, 17495, 17615, 17665,

17715, 21760, 21790

1323^{mw}, 1386^{mw}, 9450, 17495, 17530, 17615,

17635, 17665, 17715, 21760, 21790

1323^{mw}, 9450, 15470, 15490, 17495, 17530,

17615, 17635, 17665, 17715, 21760, 21790

1323^{mw}, 9450, 15470, 15490, 17495, 17530, 17615,

17665, 21760, 21790

1323^{mw}, 9450, 15470, 15490, 17495, 17530,

17615, 17635, 17665, 17715, 21760, 21790

1323^{mw}, 9450, 15470, 15490, 17495, 17530, 17615, 17635, 17665, 17715, 21760, 21790

1323^{mw}, 9450, 15470, 15490, 17495, 17530, 17615, 17665, 17715, 21760, 21790

1323^{mw}, 9450, 15470, 15490, 17495, 17530, 17615, 17665, 17715, 21760, 21790

1125^{mw}, 4730, 4940, 4975, 7510, 11655, 12025, 15510, 17570

1125^{mw}, 4730, 4940, 4975, 7510, 11655, 12025, 15510, 17570

693^{mw}, 1215^{mw}, 1323^{mw}, 7330, 9450, 9710, 9765, 11980, 12020, 12030, 12070, 15485

693^{mw}, 1215^{mw}, 1323^{mw}, 7330, 9450, 9710, 9765, 11980, 12020, 12030, 12070, 15485

11775, 11850, 11930, 15490, 15515, 17570

11775, 11850, 11930, 15490, 15515, 17570

9765, 9775, 11655, 11775, 12070, 15350, 17570

9765, 9775, 11655, 11775, 12070, 15350, 17570

1143^{mw}, 1494^{mw}, 7290, 9765, 9775, 9820, 11655, 11675, 11775, 12045, 12070, 15350

1143^{mw}, 1494^{mw}, 7290, 9765, 9775, 9820, 11655, 11675, 11775, 12045, 12070, 15350

1494^{mw}, 7290, 7425, 7445, 9440, 9450, 9765, 9775, 9820, 11630, 11655, 11675, 11775, 11850, 12045, 12070, 15350

1494^{mw}, 7290, 7425, 7445, 9440, 9450, 9765, 9775, 9820, 11630, 11655, 11675, 11775, 11850, 12045, 12070, 15350

1323^{mw}, 1494^{mw}, 7425, 9440, 9470, 9710, 9765, 9775, 9820, 11675, 11850

1323^{mw}, 1494^{mw}, 7425, 9440, 9470, 9710, 9765, 9775, 9820, 11675, 11850

minutes long.

SWEDEN: RADIO SWEDEN

Radio Sweden, S-105 10, Stockholm, Sweden

Telephone: +46 8 784 7281

FAX: +46 8 660 2990

E-mail: info@rs.sr.seInternet: www.sr.se/rs/

Time	Area	Frequencies
0130-0200	Asia, Americas	9435, 11985
0230-0300	Americas	7135, 9495
0330-0400	Americas	9475, 11665
1130-1200	Americas	15235, 15240, 17870
1230-1300	Asia	13740, 15240
1330-1400	Asia, Americas	13740, 15240, 17515
1730-1800	Europe	1179 ^{mw} , 6065, 13855 (Sunday only), 15735
1930-2000	Europe	1179 ^{mw} , 6065
2030-2100	Europe	1179 ^{mw} , 6065, 13830 (Saturday and Sunday only)
2130-2200	Europe	1179 ^{mw} , 6065, 9430

UNITED KINGDOM: BBC WORLD SERVICE

BBC World Service, Bush House, London WC2B 4PH, United Kingdom

Telephone: +44 (0)171 240 3456

FAX: +44 (0)171 257 8258

E-mail: worldservice.letters@bbc.co.ukInternet: www.bbc.co.uk**Satellite:**

In Europe: Astra 1B 19.2°E, transponder 23 (UK Gold TV) 11.552 horizontal polarisation, audio 7.38MHz. In North America: Satcom C3 131°W, transponder 3.840GHz, vertical polarisation, audio 5.40MHz.

Internet:www.bbc.co.uk/worldservice**Programmes for Europe on short, medium and long wave:**

Time	Frequencies
0000-0200	198 ^{lw} , 648 ^{mw}
0200-0300	198 ^{lw} , 648 ^{mw} , 9410
0300-0400	198 ^{lw} , 648 ^{mw} , 1323 ^{mw} , 5875(to 0330), 6180, 6195, 9410
0400-0500	198 ^{lw} (to 0415), 648 ^{mw} , 1323 ^{mw} , 3955, 6180, 6195, 7325(from 0430), 9410, 12095
0500-0600	648 ^{mw} , 1323 ^{mw} , 3955, 6180, 6195, 9410, 12095
0600-0715	648 ^{mw} , 1323 ^{mw} , 6180 (to 0630), 6195, 7325, 9410, 12095, 15565(from 0700)
0715-0800	648 ^{mw} , 1323 ^{mw} (Sat & Sun), 6195(to 0730), 7325, 9410, 12095, 15565
0800-0900	648 ^{mw} (Mon-Fri from 0815), 1323 ^{mw} (Sat & Sun), 7325(to 0815), 9410, 12095, 15576, 17640
0900-1500	648 ^{mw} , 1323 ^{mw} , 9410, 12095, 15565, 17640
1500-1600	648 ^{mw} (to 1515), 1323 ^{mw} , 9410, 12095, 15575
1600-1700	648 ^{mw} , 1323 ^{mw} , 9410, 12095, 15575
1700-1900	648 ^{mw} (not Mon-Fri 1730-1830), 1323 ^{mw} , 6180, 6195, 9410, 12095, 15575
1900-2000	648 ^{mw} , 1323 ^{mw} , 6180, 6195, 9410, 12095
2000-2230	648 ^{mw} , 1323 ^{mw} , 6180, 6195, 7325, 9410, 12095
2230-0000	648 ^{mw} , 1323 ^{mw} (to 2330)

The BBC World Service has a very complex programme schedule. There is News of various sorts on every hour, ranging from full-scale programmes such as *Newshour*, *Newsdesk* and *Newsday*, through 'running news' such as *The World Today*, to 15, 10 and 5 minute bulletins and one minute summaries. Off the hour, the BBC covers the whole range of radio subjects, including documentaries, Science, Music, Drama, Sport, Religion etc. There is variation from month to month and week to week,

making it impossible to list everything in such a limited space. Contact the BBC for details of their programme magazine *On Air*, and see their web site (www.bbc.co.uk/worldservice).

The above frequency schedule is for Europe only. To include the whole frequency schedule would also take too much space. Full frequency listings for the five other regions of the world can be found in the AIB's *Global Radio Guide*.

SWITZERLAND: SWISS RADIO INTERNATIONAL

Swiss Radio International, Giacomettistrasse 1, 3000 Berne 15, Switzerland

Telephone: +41 31 350 9790

FAX: +41 31 350 9580

E-mail: english@sri.srg-ssr.ch

Internet: www.srg-ssr.ch/sri/

Time	Target	Frequencies
0100-0130	Americas	9885, 9905
0400-0430	Europe	5840, 6165
0400-0500	Americas	9885, 9905
0530-0600	Europe	5840, 6165
0730-0800	Africa	9885, 11860, 13635
0615-0630	Europe	6165, 9535
0830-0900	Australasia	9885, 13685
1000-1030	Europe	6165, 9535
1100-1130	Asia	9810, 17515

Time	Target	Frequencies
1200-1230	Europe	6165, 9535
1200-1300	Europe	6165, 9535
1300-1400	Asia	7230, 7480
1400-1500	Asia	9575, 15265
1600-1615	Asia	9675, 15265
1700-1730	Europe	9905
1900-1930	Europe	6165, 9885
2000-2030	Africa, Middle East	9840, 9885, 9905, 11725
2100-2130	Europe	9905

UNITED KINGDOM: WORLD RADIO NETWORK

PO Box 1212, London SW8 2ZF, United Kingdom

Listener answer-line: +44 (0)171 896 9010

FAX: +44 (0)171 897 9007

E-mail: online@wrn.org

Internet: www.wrn.org

Satellite:

Europe: Astra 1B 19°E, transponder 22 (VH-1) 11.538GHz, audio 7.38MHz

Internet:

www.wrn.org

This London-based broadcaster is a distributor of international radio services on satellite and the Internet. The programmes, in English and other languages, can be heard world-wide. The basic streams available are WRN1 (English), WRN2 (multilingual) and WRN3 (German).

WRN1 is available in several regional streams. The audio can be heard live, according to the schedule below, or on-demand. Extensive details are available from the WRN web site, or by E-mail, post, or ring their answerline. Alternatively you can FAX them for more details.

WRN1 programmes to Europe, on satellite and on the Internet:

0025	Earth & Sky	1200	NPR Morning Edition (Mon-Fri); NPR Weekend Edition (Sat & Sun)
0030	Radio Sweden	1300	Radio France International
0100	NPR All Things Considered (Tue-Sat) (rpt), NPR Weekend Edition (Sun & Mon)	1400	Voice of Russia (Mon-Fri); Radio New Zealand (Sat); VOA Communications World (Sun)
0200	CBC As It Happens (Tue-Sat); RCI News & Features (Sun); RCI News & Features (Mon)	1430	Adventist World Radio
0300	Polish Radio Warsaw	1500	ABC Radio Australia
0330	Radio Budapest (Mon-Fri); Glenn Hauser's World of Radio (Sat); UN Radio from New York (Sun)	1600	CANA - News from the Caribbean (Mon-Fri); Vatican Radio World News (Mon-Fri); Glenn Hauser's World of Radio (Sat); Copenhagen Calling (Sun)
0400	PRI Market Place (Tue-Sat); SABC Network Africa (Sun); Copenhagen Calling (Mon)	1630	ORF Radio Austria International
0430	ORF Radio Austria International	1700	Channel Africa (Mon-Sat); Norden This Week & Health Watch (Sun)
0500	Swiss Radio International	1730	RTE Dublin
0600	NPR All Things Considered (Tue-Sat) (rpt); NPR Weekend All Things Considered (Sun & Mon)	1800	Radio Vlaanderen International
0700	ABC Radio Australia	1830	Radio Netherlands
0800	Radio Budapest Hungary (Mon-Fri); Radio New Zealand (Sat); Adventist World Radio (Sun)	1925	Earth & Sky
0830	Radio Canada International (Mon-Fri); UN Radio from New York (Sat); VOA Communications World (Sun)	1930	Radio Sweden
0900	Radio Prague	2000	YLE Radio Finland
0930	SABC Channel Africa (Mon-Sat); Glenn Hauser's World of Radio (Sun)	2030	Polish Radio Warsaw
1000	ABC Radio Australia (Mon-Fri) (rpt); NPR Car Talk (Sat); PRI Prairie Home Companion (Sun)	2100	VOA World Report (Mon-Fri); VOA (Sat & Sun)
1100	NPR Morning Edition (Mon-Fri); NPR Fresh Air (Sat); PRI Prairie Home Companion (Sun)	2200	PRI The World (Mon-Fri); NPR All Things Considered (Sat & Sun)
		2300	Radio Budapest Hungary
		2330	Radio Netherlands

UNITED STATES OF AMERICA: THE VOICE OF AMERICA

The Voice of America, 330 Independence Avenue, Washington DC 20547, USA

Telephone: +1 202 619 2538

FAX: +1 202 619 1241

E-mail: -

Web: www.voa.gov

VOICE OF AMERICA



Frequencies for Europe and North Africa:

Programmes to Africa

Time	Frequencies
0300-0330	909 ^{mw} , 1530 ^{mw} , 4960, 6080, 7280, 7290, 7340, 9575
0330-0400	909 ^{mw} , 1530 ^{mw} , 6080, 6115, 7280, 7105, 7290, 9575, 9885
0400-0430	909 ^{mw} , 1530 ^{mw} , 6080, 6115, 7105, 7265, 7280, 7290, 9575, 9885
0430-0500	909 ^{mw} , 7265, 6080, 7280, 7290, 9575
0500-0600	909 ^{mw} , 5970, 6035, 6080, 7195, 9630, 12080
0600-0630	909 ^{mw} , 1530 ^{mw} , 5970, 6035, 6080, 7195, 9630, 11995, 12080
0630-0700	909 ^{mw} , 1530 ^{mw} , 5970, 6035, 6080, 7195, 9630, 11995, 12080
1600-1700	909 ^{mw} , 1530 ^{mw} , 6035, 13600, 13710, 15225, 15410, 15445, 17895
1700-1730	909 ^{mw} , 1530 ^{mw} , 15410, 15445, 17895
1730-1800	909 ^{mw} , 15410, 15445, 17895
1800-1830	909 ^{mw} , 6035, 7415, 11975, 15410, 15580, 17895
1830-1900	909 ^{mw} , 6035, 7415, 11975, 15410, 15580, 17985
1900-1930	909 ^{mw} , 4950, 6035, 7375, 7415, 11975, 15410, 15445, 15580
1930-2000	909 ^{mw} , 4950, 6035, 7375, 7415, 11975, 15410, 15445, 15580
2000-2030	909 ^{mw} , 1530 ^{mw} , 4950, 6035, 7375, 7415, 11855, 11975, 15445, 17725, 17755
2030-2100	909 ^{mw} , 1530 ^{mw} , 6035, 7375, 7415, 11975, 15445, 17725, 17755
2100-2130	909 ^{mw} , 1530 ^{mw} , 6035, 7375, 7415, 11975, 15410, 15445, 15580, 17725
2130-2200	909 ^{mw} , 1530 ^{mw} , 6035, 7375, 7415, 11975, 15410, 15445, 15580, 17725
2200-2230	909 ^{mw} , 1530 ^{mw} , 6035, 7340, 7375, 7415, 11975

Programmes to Europe and North Africa

Time	Frequencies
0000-0300	1197 ^{mw}
0400-0430	792 ^{mw} , 7170, 11965, 15205
0430-0500	7170, 11965, 15205
0500-0515	792 ^{mw} , 1197 ^{mw} , 7170, 11965, 15205
0515-0530	792 ^{mw} , 1197 ^{mw} , 7170, 11965, 15205
0530-0600	792 ^{mw} , 1197 ^{mw} , 7170, 11965, 15205
0600-0700	792 ^{mw} , 1197 ^{mw} , 7170, 9680, 11805, 11965, 15205
1130-1200	11680
1200-1400	1197 ^{mw}
1400-1500	15255
1500-1530	5205, 15255
1530-1600	1197 ^{mw} , 15205, 15255
1600-1630	15205, 15255
1630-1700	15205, 15255
1700-1800	9760, 15135, 15255
1800-1900	1197 ^{mw} , 9760
1900-1930	9760, 9770
1930-2000	9760, 9770
2000-2100	9760, 9770, 15410, 15580
2100-2200	9535, 9760
2300-2400	1197 ^{mw}

For the world's major
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