

FOR THE  
RADIO LISTENER

# shortwave magazine

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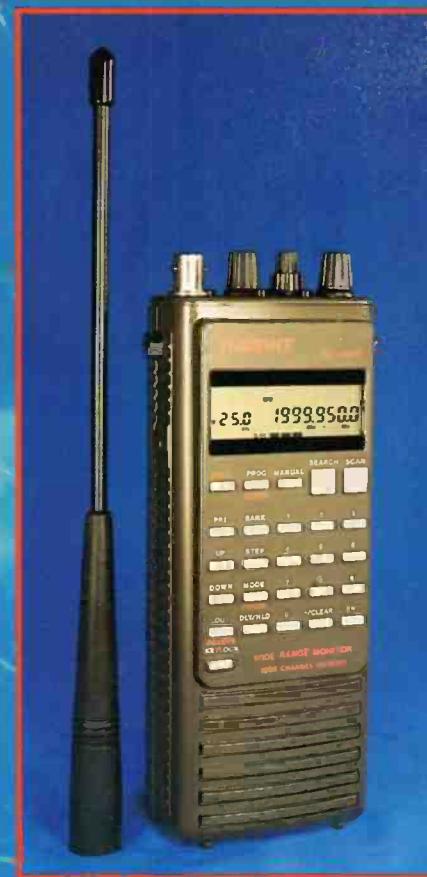
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# short wave magazine

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## Cover Subject

49 metre  
Broadcast  
Antenna.  
Photo: Mark Kirk



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**Good Listening**

## SWM SERVICES

### Subscriptions

Subscriptions are available at £22 per annum to UK addresses, £25 in Europe and £27 overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £39(UK) £42 (Europe) and £45 (rest of world).

### Components for SWM Projects

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

The printed circuit boards for SWM projects are available from the SWM PCB Service, Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. Tel: 021-353 9326.

### Back Numbers and Binders

Limited stocks of most issues of *SWM* for the past five years are available at £2.00 each including P&P to addresses at home and overseas (by surface mail).

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Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Broadstone (0202) 659930. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Poole (0202) 659950.

# editorial



The response to the trial page of Propagation Charts in the June issue has shown that a lot of *Short Wave Magazine* readers have a need for this information on a regular basis. I am now trying to negotiate for a regular supply of these charts within my Editorial Budget - yes, editors do have budgets to work with!

One omission from the page was an explanatory paragraph on how to use the charts. This appears on page 51 of this issue - unfortunately too late to enable you to use the charts for June in anger.

### Hamfest UK

*Short Wave Magazine* is sharing a stand with its sister magazine *Practical Wireless* at the new two-day Hamfest UK, being held near Stafford. Unfortunately, I will not be there as I will be returning from Friedrichshafen where we also have a stand at Ham Radio 94. However, far more interesting than talking to me is the opportunity to quiz Mike Richards, our 'Decode' columnist, on anything pertinent to the 'data modes'. Mike will be on the stand on both days and he tells me that he is looking forward to meeting you all. Gather together your listening problems and see if Mike can solve them for you? Details of Hamfest UK can be found on page 38.

While on the subject of rallies and shows, don't forget to look at the list of rallies on page 4. Those marked with an asterisk are the ones at which SWM has a stand and you will always find a welcome there. Whoever is on the stand will always listen to you, no matter whether you have a grouse or are offering ideas for how you would like to see the magazine develop.

Dick Ganderton G8VFH

# letters

IF YOU HAVE ANY POINTS OF VIEW THAT YOU WANT TO AIR PLEASE WRITE TO THE EDITOR. IF YOUR LETTER IS PUBLISHED YOU WILL RECEIVE A £5 VOUCHER TO SPEND ON ANY SWM SERVICE

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

### Dear Sir

My name is Michael Osborn. I am a very keen short wave enthusiast here in Norfolk and have been a hobbyist since 1985, aged thirteen years.

I am at the moment attempting to set up a Listeners' Fellowship for Norfolk and possibly East Anglia, but my efforts to lift the idea off the ground have so far been disappointing. I am aware of the stature of your publication amongst enthusiasts - The British DX Club, which I am a member of personally, reported a healthy surge in subscriptions after coverage in *SWM*. I just wonder if you would be kind enough to give over a small space to promote our Fellowship.

The aim of the group is very simple - to bind together radio listeners from Norfolk and surrounding counties in a spirit of friendly co-operation. There are no plans for a newsletter or journal, but the objective is to exchange information and ideas on individual bases or informal meetings for much the same purpose. I would like to stress that all spheres of interest would be welcomed and more so all levels of experience and knowledge, age, gender and related considerations - seasoned old-timers to absolute beginners.

You may have gathered that the group has been started, but has only two participants so far! The Norfolk Shortwave Listeners' Fellowship has provisionally been adopted as the name; I would gladly see this graduate to East Anglia. I'm hoping that you will be willing to help. My own address and telephone number are presently the contacts for those interested.

Greetings and Best 73s to you all.

**Michael Osborn, 16 Banister Way, Wymondham, Norfolk NR18 0TY Tel: (0953) 605783.**

### Dear Sir

If any readers would like names, addresses, telephone/FAX Numbers, etc. of radio, TV, satellite and cable networks worldwide, embassies, media organisations, tourist and information offices, addresses of publishers of newspapers, magazines or periodical throughout the world, or information concerning a particular area or country, they should write to me with as much information as possible enclosing a self addressed envelope and two first class stamps/or one IRC if outside the UK.

I am also compiling lists of DX clubs, clandestine and free radio stations from anywhere in the world and would appreciate information on these.

I enjoy listening to all broadcasts and finding out about the appropriate countries and it would be nice to think that, in some small way, I can help others enjoy this fascinating hobby even more and maybe broaden their knowledge of other countries.

My best wishes to you all.

**Kimberley Clift  
50 Dryleys Court  
Northampton NN3 8XY**

# letters

## Dear Sir

I am completely new to short wave listening. I have read your magazine for the last three months and I wonder if you could help me. I do not think you have a query page, but you could perhaps publish part of this letter and put my address on it.

I am trying to receive Italian radio stations, principally because I am studying Italian and I want to listen to as many broadcasts as possible.

I had a short wave radio and on it I was able to receive Radio Vatican (5.882MHz) although it was a bit hiss and miss. The set is 15 years old!

I then bought a Lowe HF150, put up along wire aerial (about 90 feet) and bought a Lake TU3 a.t.u. I thought with the improved equipment I would be able to receive Milan (900kHz) and Rome (846) as their kilowatt output seems quite high. Unfortunately I can't. All I can get is Vatican Radio! The Lowe has a 20dB attenuation option and the a.t.u. a 12dB one, but using neither have I been successful. I just get a mish-mash of sounds with very occasional Italian.

I see from your May issue that some readers have in fact received both these stations. Is there anything further I can do? It may be course that they are using more sensitive equipment. Is this the answer?

My old radio has f.m. on it but I cannot get anything on this. Any help would be appreciated.

**A. R. Davies, 133 Brookdale Avenue South  
Greasby, Wirral, Merseyside L49 1SP**

## Dear Sir

Are we beginning to loose sight of what a radio rally is supposed to be about? I write this as someone who has just spent the last six months or so booking one of amateur radio's 'Special Interest Groups' into the varies rallies held up and down the country. I am usually greeted with one of two distinctly different reactions by the rally organisers. There are those organisers who view the presence of a 'Special Interest Group' at their rally as a positive advantage. They use the group's name or names in their publicity material which in turn encourages people to attend the rally who, perhaps otherwise, wouldn't bother. The presence of the group also shows that the organisers are in touch with the hobby and are committed to ensuring that all facets of the hobby are represented at their rally. These organisers recognise the fact that most of the groups are operated on a voluntary basis and are only looking to make sufficient money as to cover their running costs and therefore either allow the group a table at special rates or, as in some cases, waive the cost of the table altogether.

Then there are those organisers who view the 'Special Interest Group' as a loss of revenue, a waste of time and table space which could easily be more gainfully occupied by a trader who would be willing to pay the full going rate for a table. These organisers are not willing to talk about special rates or free tables. 'You either pay the going rate or you don't attend, it's your loss'. What they don't realise or don't want to realise is that it's not just our loss, it's a loss to everyone that attends the rally. Maybe not everyone will be interested in our stand,

but at least if the stand was there, they would have the opportunity to see for themselves. The last organiser I spoke to told me that their committee thought it unfair for the traders to subsidise the 'Special Interest Groups' and yet I've lost count of the amount of marquees and hall I've wondered through with empty tables.

A radio rally is not just about buying new, second-hand equipment or junk, we can do that at our local emporium. It also serves as a meeting place, somewhere that radio enthusiasts of all interests can get together and talk radio. It's a place to meet friends both old and new and to make new friends. It's a place where one can gain access to as many facets of the hobby as is possible all gathered in one place, a nucleus of information. I appreciate that the 'Host Club' has got its overheads (marquee or hall hire, table hire, refreshments etc). I can also appreciate that a rally can be an excellent way of raising club funds for that new rig or antenna, but when the amount of profit that the 'Host Club' can make above its overheads, outweighs the overall content and quality of the rally itself, then I really think that we're losing sight of the whole point of the exercise.

We have all got to remember that, individually, the 'Special Interest Group' may not account for a large number of people, but together they represent a good percentage of the radio fraternity without whom the rally would have precious few attendees.

**Chris Carrington  
G-20365/G0IYZ  
Chellaston  
Derby**

## Dear Sir

I am totally in agreement with T.A. Smith's letters (May SWM) on the subject of r.f. noise pollution and the lack of interest in reducing it which is shown by the authorities and the manufacturers.

Recently, after using my Sanyo music-centre on v.h.f. to hear a stereo broadcast, I switched to medium wave and set the pointer to the 1.6MHz end of the dial, prior to searching the band.

Immediately, I was surprised to hear a very strong speech transmission, in English, which would not normally be found around that frequency. At first, it sounded like a play, with a woman's voice at close range and a man's voice responding, but at a distance. It wasn't long before I realised that I was receiving both ends of a cordless telephone conversation, reaching my receiver on a very strong harmonic but well away from its fundamental.

The signal was so strong and of excellent audio quality that it had to be locally generated. I even thought that I recognised the lady's voice, so, some time later, I switched my receiver on again, with the pointer set at the h.f. end of the medium wave, and dialled her telephone number. After dialling the seventh digit, there was a loud crash through my speakers as the base unit's transmitter activated, followed by a ringing tone, and then my neighbour (almost exactly opposite, on the other side of the road) answered her phone!

Another neighbour in the street parallel to mine, our gardens are nearly back to back, is a CB operator. He uses a lengthy, vertical antenna with a ground-plane section at its base, and the structure is mounted at the eaves of his house. When he operates, harmonics of his signal appear all over the various short wave bands on another receiver of mine, a Vega 'Selena' 215.

I live in a terrace of four houses. Another neighbour, at the end of the terrace, has a TV

signal distribution amplifier in his loft. When he uses his satellite receiver, I can get SKY television (or whatever else he happens to be watching) when my own television is switched to the video channel. I've even eavesdropped on his holiday video on my television before realising what was happening! I dread to think what will happen if Channel 5 eventually gets going on nearby u.h.f. frequencies.

Several years ago, my radio-listening hobby was virtually suspended whenever a neighbour at the other end of the terrace watched television. Harmonics all but blotted out medium and long wave signals, short wave reception was severely inhibited by the swamping effect of time-base harmonics. Luckily, this neighbour now has a new television set which causes very little interference, the old one probably exploded!

Conditions in a block of flats must be even worse, but all the people I've mentioned are totally law-abiding and blissfully unaware of what is happening, it is the equipment which is at fault and not them. In fact, another music-centre that I have (a Ferguson), when on Melody Radio (104.9MHz) happily gives way to airband transmission (116-136MHz), obviously the receiver's fault and not the aircraft transmitter's fault.

Penny-pitching by the electronics industry would seem to be mainly the reason for much of the present r.f. pollution, as with other forms of pollution. With more electronic gizmos in the average home, this problem could get worse if equipment so readily causes or allows mutual interference. So, come on you boffins, get your act cleaned up, it shouldn't be too difficult. Meanwhile, my wife is eagerly awaiting reception of Radio 4 on her kitchen cooker, presumably, *The Food Programme*.

**Ivor Nathan  
Southgate  
London**

## Dear Sir

I would like to find out more about Hacker radios, especially those produced around 1970, and to obtain some working examples of the v.h.f. and v.h.f./m.w./l.w. receivers produced about then. If any readers could help, I should be most grateful of a letter or telephone call. (0661) 853926.

**Roger Howson  
10 Algernon Terrace  
Wylam  
Northumberland  
NE41 8AX**

# grassroots

## rallies

\* June 24-26: Ham Radio '94 Friedrichshafen, Germany. The largest amateur radio show in Europe and well worth a visit. The Flea Market alone is worth the journey and Friedrichshafen, situated on the Bodensee - Lake Constance to the English - and within easy reach of Austria and Switzerland, is a fantastic area for a holiday.

**June 25 & 26:** The Wrexham ARS Mobile Rally and Boot Sale together with Shropshire Astronomical Society's Star Party is being held in conjunction with the Clwyd Veteran and Vintage Machinery Society's 16th Annual Steam Rally at the Plassey, Eytton, Nr. Wrexham. Doors open 10am to 5pm. Ian Wright GW1MLV on (0978) 845858.

\* June 26: The 37th Longleat Amateur Radio Rally is being held at Longleat House, Warminster, Wiltshire. £2.50 admission for adults, £1.50 for pensioners and 50p for children. There will be a large trade show with 180 stands, a large Bring & Buy, and craft fair. Shaun O'Sullivan G8VPG on (0272) 860422 (office hours) or (0225) 873098.

**June 26:** The Norfolk Raynet Barford Rally will be held at the Village Hall, Barford on B1108 Norwich-Watton Road. Doors open 10am, there will be trade stands, a raffle and refreshments. Free car parking and talk-in on S22. Further details from Bill G4TWT, QTHR. (0603) 427008.

\* July 2/3: HAMfest-UK. A new event for Amateur radio, s.w.l. and computer enthusiasts will be held at The County Showground, Weston Road, Stafford off junction 14 M6. Large trade presence, free parking, lectures, Bring & Buy, special interest groups, Morse testing and flea market. (0923) 893299.

**July 3:** The 5th York Radio Rally will be held in the Tattersall Building, York Racecourse, Knaveesire, York. Doors open 10.30am, admission £1. Ample free parking, amateur radio, electronics and computers, arts and craft, Morse tests, licensed bar and cafe, talk-in on S22. Dave Moreland G7FGA on (0904) 790079.

\* July 9: The Cornish Radio Amateur Club are holding their annual rally at Penair School, Truro. Doors open at 10.30am. There will be an official Morse test (via RSGB), hot snacks, free parking and talk-in on S22. Ted Kier G1DTS on (0872) 222605.

**July 10:** The Horncastle Amateur Radio, Electronics and Computer Fair is being held halfway between Lincoln and Skegness. The venue will be signposted from the main roads that come from Boston, Louth, Skegness and Lincoln. There will be a large sports hall with traders from all over Britain, free parking, Bring & Buy, Talk-in on S22. Still only £1 entry, same as the last three years. Tony Nightingale G6CZV on (0507) 522482 or packet message to G6CZV @ GB7LNX.

**July 10:** The Sussex Amateur Radio and Computer Fair will be held at the Brighton Race Course. Doors open 10.30am to 4pm. There will be trade stands, a Bring & Buy stall, picnic area and refreshments, car parking and a free shuttle to Brighton sea front. R. C. Gornall G7DME on (0273) 501100.

**July 17:** The 11th McMichael Rally and Car Boot Sale will be held at the Haymill Youth and Community Centre, Burnham Lane, Slough (near Burnham railway station). The event starts at 10.30am, admission is £1.50. There will be free parking on the site and a talk-in is available on S22. Neil GOSVN or Roy G4XVN on (0628) 25952.

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

## AVON

**RSGB City of Bristol Group:** last Tuesdays, 7pm. New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. June 26 - Longleat rally, July 26 - RAF Bombers Ops. Dave. (0272) 672124.

**Shirehampton ARC:** Fridays. June 26 - Longleat rally, July 15 - DF briefing. Ron Ford G4GTD. (0272) 770504.

**South Bristol ARC:** Wednesdays. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. June 26 - Longleat rally, 29th - Home construction (judging) for trophy, July 6 - 10m activity evening, 13th - DIY crystal set, 27th - Magazine exchange - or for SBARC rally table. For more information ring (0275) 834282 on a Wednesday evening.

## BEDFORDSHIRE

**Shefford & DARS:** Thursdays, 8pm. Church Hall, Ampthill Road, Shefford, Bedfordshire. June 30 - Pedestrian DF hunt and final planning of VHF NFD, July 14 - BBQ. Paul G1GSN. (0462) 700618

## BERKSHIRE

**Maidenhead & DARC:** 8pm, The Red Cross Hall, The Crescent, Maidenhead. July 2 & 3 - VHF Field Day at Coombe Hill, 7th - Melish Reef DXpedition by John G3WGV, 17th - McMichael rally. Neil Savin GOSVN. (0628) 25952.

## DORSET

**Dorset Police ARS:** 1st and 3rd Thursday at Force HQ at 7.30pm. June 26 - Longleat rally, July 3 - VHF Field Day continued into the 4th, 7th - Visit to Rampisham, 21st - The 1st DPARS annual fox hunt, 23rd - RSGB VHF Low power contest. (0202) 229351.

## EAST SUSSEX

**Hastings Electronics & RC:** 3rd Wednesdays, 7.45pm. West Hill Community Centre, Croft Road, Hastings. July 10 - Sussex Amateur Radio & Computer Fair at the Brighton Racecourse. Opens 10.30am till 4pm, 20th - Main meeting - the usual junk sale. G3YYF on (0424) 830454.

## GRAMPIAN REGION

**Aberdeen ARS:** Fridays, 8pm. Queen Mother House, Aberdeen. June 24 - Fox hunt, July 1 - Junk sale, 8th - Building the Yearling Part 4, 15th - Trades holiday - rag chew, 22nd - Trades holiday - rag chew. Gordon Stuart GM7PXW. (0224) 780591.

## GREATER LONDON

**Crystal Palace & DRC:** 3rd Saturdays, 7.30pm. All Saints Church Parish Rooms, Beulah Hill, London SE19. July 16 - Annual outing. Wilf G3DSC on 081-699 5732 or Bob on (0737) 552170.

**Wimbledon & DARS:** 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road SW19. June 24 - VHF aerial by J. Gale G4WVJ. 081-540 2180.

## HAMPSHIRE

**Horndean & DARC:** 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross, Horndean. July 7 - The Nab Tower by Bernard Green. S. Swain (0705) 472846.

## Club Secretaries:

Send all details of your club's up-and-coming events to: Lorna Mower, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Please tell us your County and keep the details as brief as possible.

## HEREFORD & WORCESTER

**Bromsgrove ARS:** 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. June 28 - Antenna construction (2m DF), July 12 - 2m DF Hunt, 26th - Technical topics/talk. Barry Taylor. (0527) 542266.

## HERTFORDSHIRE

**Hoddesdon RC:** Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. June 23 - Operating from Tolmers Scout Camp Cuffley under GB2 RST from 1400, followed by BBQ and VHF DF Fox Hunt from 1900. July 2 - Ware Carnival Special Event Station, followed by VHF National Field Day, 7th - Second visit of remaining members to Stanstead (London) Air Traffic Control Centre, 23rd - Operating from Tolmers Scout Camp, Cuffley form 1400, with talk on astronomy by Brian Bond. John G7OCL. (0920) 466639.

## KENT

**Bromley & DARS:** 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. July 19 - BBQ and operating evening. A Messenger. 081-777 0420

**Medway AR & TS:** Fridays, 7.30pm. Tunbury Hall Carkin Close, Tunbury Avenue, Walderslade, Chatham. July 1 - Talk 'Kent IP Group - TCP/IP' by Keith Brazington G4LZV. Gloria. (0634) 710023.

## NORFOLK

**Norfolk ARC:** Wednesdays, 7.30pm. Formal and informal meetings at The Norman Centre, Bignold Road, Off Drayton Road between 'Asda' and Three Mile Cross Roundabout, Norwich. June 29 - (informal) Night on air, construction QRP and Morse practice, July 6 - (formal) Efficient use of aerials by Stuart Lione G3XYO, 13th - (informal) Night on air, construction ARP and Morse practice, 20th - (formal) Satellite DXing by Gordon Higgins G3PXT, 27th - (informal) Night on air, construction QRP and Morse practice. Mike G4EOL. (0603) 789792.

## NOTTINGHAMSHIRE

**Mansfield ARS:** 2nd Mondays, 7.30pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. July 11 - Natter night. Howard G1JGY. (0623) 423697.

**South Notts ARC:** Fridays, 7pm. Highbank Community Centre or Fairham Community College, Farnborough Road, Clifton Estate, Nottingham. June 24 - On air h.f. and v.h.f. and contruction at Fairham college, July 1 - Talk-in on S22, talk on the development of RISC processing and review of current software by Raymond Roulstone G0SOM, 8th - Visit to Nottinghamshire Police HQ Control Centre, Sherwood Lodge, 10th - Third fox hunt, 15th - Talk-in on S22, 22nd - Construction and on air h.f. and v.h.f. at Fairham College. Julie Brown G0SOU. (0602) 211069.

## SHROPSHIRE

**Salop ARS:** Thursdays, 8pm. Oak Hotel, Shrewsbury. June 23 - A talk on telephonic systems by Graham G7LID, 30th - National field day preparations, July 7 - Natter night, 14th - A visit to Whittington House British Telecom

Oswestry, Shropshire, 21st - Foxhunt - chase 4, 28th - A talk on antenna construction by Charlie GW3JPT. Sheila Blumfield G0SST. (0743) 361935.

## SOMERSET

**Yeovil ARC:** Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. June 23 - A practical look at aerial matching units by G3CQR, 30th - Club station on the air and committee meeting, July 7 - ZD8 Land by G3KSK, 14th - Club visit to the Stockland Hill Television Transmitter, 21st - The PC - your best friend in the shack by G4JBBH, 28th - Clubstation on the air and committee meeting. Cedric White, QTHR. (0258) 473845.

## SUFFOLK

**Haverhill & DRC:** 2nd Mondays, 7.30pm. Samuel Ward Upper School, Chalkstone Way, Haverhill. Rob Proctor G4PZW. (0440) 704637.

**Sudbury & DRA:** 1st & 3rd Tuesdays, Wells Hall, Old School, Great Cornard, Five Bells Public House, Bures Road, Great Cornard. June 25 - Special Event Station at Gt. Cornard Middle School, July 5 - Talk on Propagation by Mike G4GGC, 14th - Special event Station at Woodhall School, 19th - Natter & Noggin night. Tony Harman G8LTY. (0787) 313212

## WARWICKSHIRE

**Stratford-upon-Avon & DRS:** 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. June 25 - Treasure hunt and BBQ, 27th - Night on the air, July 11 - Electronic building blocks by Bill Mansfield, 25th - Annual construction competition. Mr A Beasley G0CXJ. (0608) 682495.

## WEST MIDLANDS

**Sandwell ARC:** The Broadway, Warley. RAE class on Monday nights, Morse class on Wednesday nights and RAE Novice class on Thursday nights. Three operating shacks, h.f./v.h.f./u.h.f., Phone, c.w., RTTY, AMTOR, Packet, all bands. Talks, outings, contest and demonstrations. For further information please ring 021-552 4619/021 552 4902.

**West Bromwich Central Radio Club:** Sundays, 7.30pm (talks begin at 8pm). The Sandwell Hotel (upstairs function room), High Street, West Bromwich. June 25 - Annual open day at Hampstead Infant School, Tanhouse Avenue, Great Barr, July 3 - Talk by John G8NZD 'Earth Bondage for Terrestrials, 9/10th - National power open day. Ian Leitch. 021-561 2884 (home) or (0902) 353522 ext. 2093 (office).

## WILTSHIRE

**Salisbury Radio & Electronic Society:** Tuesdays, 7.30pm. 3rd Salisbury Sea Scout Hut, St Marks Avenue, Salisbury. June 26 - 37th Longleat rally, 28th - 2m mobile 'Foxhunt', July 3 - RSGB DF qualifying event. David Kennedy. (0722) 330971.

**Trowbridge & DARC:** 3rd Wednesday, 8pm. The Southwick Village Hall, Southwick, Trowbridge. July 6 - Inter club family skittles, 20th - Natter night. Ian GOGRI. (0225) 864698.

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

# junior listener

## More Information

Carrying on from last month with useful sources of information, here's a useful booklet for short wave listeners. Called the ISWL's *Guide to English Language Short Wave Broadcasts to Europe - Summer Schedules 1994*, the title alone explains what you can expect from it. Let me tell you about the price first. It's just £1.30 including post and packing. Alternatively you can send either two IRCs or postage stamps to the value of £1.30.

The information provided in this guide is written quite clearly and presented in an easy-to-read format. You get all the information in time order with other details like country and station names, frequencies, programme details - whether it's news, sport, religious or features, etc. Please note that all the frequencies in the booklet are given in kilohertz.

If you're not sure when you should be listening for your favourite type of station or programme, this booklet will certainly put you on the right track. Send to: International Short Wave League, 10 Clyde Crescent, Wharton, Winsford, Cheshire CW7 3LA.

## RST

An abbreviation system commonly used by listeners and amateurs is the RST code - standing for Readability, Signal (strength) and Tone. This is used to describe the signal you are receiving.

Readability is on a scale of 1 to 5 and the other two are on a scale of 1 to 9. If used properly, this can give the operator a good idea of how well his signals are reaching the target. It's no good saying your signal is 599 (the best possible rating) and then asking for repeats of all the details because you can't work out what they are! Tell the truth when making your report, it is much more helpful.

### Readability

- R1 Unreadable. The signal you are trying to receive is so bad that you can't make out anything definite.
- R2 Barely readable. This means you can pick-out occasional words in the message.
- R3 Readable but with considerable difficulty.
- R4 Readable with almost no difficulty at all.
- R5 Perfectly readable. Don't forget this means you can clearly hear every word in the message.

### Signal Strength

- S1 Faint signals. The signals would be just detectable if you use this marking.
- S2 Very weak signals.
- S3 Weak signals.
- S4 Fair signals.
- S5 Fairly good signals.
- S6 Good signals.
- S7 Moderately strong and good signals.
- S8 Strong signals.
- S9 Very strong signals.

### Tone (usually only applicable to Morse signals)

- T1 Extremely rough, hissing sound.
- T2 Very rough note, not a bit musical as Morse should be.
- T3 Rough and low-pitched note, only slightly musical.
- T4 Rather rough sounding, but moderately musical.
- T5 Musically modulated note.
- T6 Modulated note with just a slight trace of whistle.
- T7 A musical note with some ripple on it.
- T8 A very good note with just a slight trace of ripple on it.
- T9 A pure musical note.

Obviously, the RST rating of any signal is purely a personal judgement. Rarely will you find two people giving exactly the same rating, but do your best.

## IRCs

IRCs or International Reply Coupons are almost like an international currency to the short wave listener. They can be used to purchase a whole range of goods and services, not least of which is their true purpose of buying postage stamps.

You can buy your coupons from most local Post Offices - although I'm not sure that some of the smallest rural branches will have them, certainly all main Post Offices do. These days they cost 60p each and can be sent to just about anywhere in the world in place of postage stamps. If you have one sent to you and wish to use it, just take it along to your post office with the letter you want to send and you can exchange them for postage stamps to send a minimum weight letter airmail anywhere in the world, which I think costs 41p in the UK. So you can see how useful they are.

Many short wave clubs both in the UK and overseas request IRCs to pay for goods and services. So it's worth saving up any sent to you and using them to pay for your next booklet or frequency guide. It's also so much easier than trying to buy mint foreign postage stamps to send with your QSL cards. They don't cost much, but they can make the difference when you are asking a station to send something back to you.

Oh yes, one last thing. They are only valid if they have no rubber stamp mark in the right-hand box!

All the frequencies in the booklet are given in kilohertz.



## Listening to Radio Amateurs

One aspect of short wave listening that many newcomers try is listening to radio amateurs. Whether you try your hand at Morse code or you listen to amateur signal sideband or f.m. signals you'll come across abbreviations. Some of the most popular are Q Codes, these are an international codes used by just about every sort of radio operator, whether amateur or professional. Of course, the codes have been adapted a little by radio amateurs to suit their purposes and they also don't use all the codes either. Some of the most common ones you'll come across are shown here. They are used as a way to save time and energy when sending Morse code, but also as a speech shorthand.

- QSO** this means a radio contact or one sort or another. For example, *I had a QSO with G4LMF yesterday.*
- QRT** this means to close down. For example, *I am going QRT now as it's getting rather late.*
- QRP** this usually means using low power. For example, *I am a QRP station using less than 1 watt.*
- QTH** this means your location. For example, *my QTH is Ringwood in Hampshire.*
- QRZ** this means who is calling me? For example, *QRZ? I can only make out the last letter of your callsign, please call again.*
- QRX** this means stand by and often things go quiet for a short while after this has been used. For example, *QRX please, I must go and answer the door bell!*
- QSL** Everyone's favourite, this means the confirmation of a contacts, usually the sending and receiving of a card. For example, *I will send my QSL via the bureau, hope to receive one from you too.*
- QSY** this means change frequency. For example, *let's move from the calling channel and QSY to S22. S22 is 145.575MHz.*
- QRM** this is used to describe man-made interference. For example, *I am having trouble hearing you, there's a lot of QRM on your signal.*

Obviously, there are loads more I could list, but these will keep you going. If you would like a much larger list of Q codes and their meaning, send me an s.a.e. and an extra stamp and I send a copy back for your reference.



# The New Concept

## AR8000UK

All Mode Wide Band World Band Radio Receiver

The AR8000 UK is the result of AOR's long term ambition to produce a new breed of radio receiver which combines full computer compatibility with advanced wide-band radio receiver technology. With the introduction of the new AR8000 UK, AOR have broken the mould of conventional radio receiver design.

At first glance the AR8000 UK in its static form may look no different to any modern hand-held scanning receiver, but the similarity ends there...just as soon as the receiver is switched on!! Initially you are greeted with the opening welcome message on the AR8000 UK multi-function liquid crystal display "WELCOME TO THE WORLD OF

AR8000 RECEIVER", in a similar way to a sign on message displayed by your personal computer. This new experience immediately demonstrates to the new user and discerning radio listener that the AR8000 UK is no ordinary radio but THE NEW CONCEPT in radio design. The modern new cabinet design measures approx 152mm (H) x 69mm (W) x 40mm (D) excluding projections and weighing only 350g including NiCads (but not aerial).

The AR8000 UK is a highly sensitive hand held receiver boasting a very wide frequency coverage of 500 kHz to 1900 MHz without gaps in the range (actual acceptable frequency input from 100 kHz). Step size is programmable in multiples of 50Hz for smooth tuning. The all-mode reception provides AM, USB, LSB, CW, NFM and WFM. An independent ±2.0 kHz SSB filter is fitted as standard and the USB/LSB modes use true carrier re-insertion with correctly calibrated frequency read-out (not offset by 1.5 kHz). A custom manufactured ferrite bar aerial is neatly internally installed at the top of the receiver's cabinet to enhance receive performance when listening in population centres to Medium Wave services or when commentary is provided at airshows and motor sport events.

The high visibility LCD is of a new dot matrix format comprising of four lines of display so many new facilities may be provided and displayed at the same time, these include a signal strength bar meter and a band-scope showing band occupancy. Two VFO frequencies may be displayed on the LCD simultaneously, one providing a stand-by frequency available for quick transfer. When frequencies are entered,

ALPHANUMERIC comments may be stored along with frequency, mode & attenuator status simplifying the job of recalling and identifying memory channels. Password protection, computer control, data clone between sets and almost every feature you could ever wish for is provided.



Supplied with NiCads, 240V ac charger, DC lead, hand strap, belt hook & screws, 16cm semi-flexible aerial, comprehensive operating manual and quick reference guide.

SCAN AM  
A 119.4000  
ABO MAN APP  
S.....

2VFO NFM  
A 145.7500  
B 433.2500  
S.....

2VFO A NFM  
A 145.3125  
S.....

2VFO NFM  
A 433.0000  
CW>AUT WFM  
MODE SET

2VFO NFM  
A 71.0000  
STEP+ 12.50  
STEP SET

CHANGE-MEM  
145.5000  
ATT = OFF  
STEP 25.00

SET M-SCAN  
BNK.LK ON  
A---E-GH---  
-bcd-----

AUTO-STORE  
BANK-J  
STORE ON  
NEXT

POWER-SAVE  
DELAY 10s  
CYCLE 3s  
NEXT

NFM  
145.8  
FREQ SET

LOW BATTERY  
A 145.7500  
B 433.2500  
S.....

INITIAL SET  
BEEP ON  
2ndF  
NEWUSER

SET P.WORD  
\*\*\*\*\*

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DELI CR,LF  
END

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## Interference from Unattended 23cm ATV stations

We have been notified by the Radiocommunications Agency of the following serious situation.

"Some instances have come to the attention of the RA's Radio Investigation Service of ATV stations working in the 23cm band (1245-1325MHz) which have been left operating unattended on sites remote from the main station address and have caused severe interference up to 40 kilometres away to air traffic control radars which are the primary users of the band. The Amateur Licence does **not** permit unattended operation of amateur TV on any band (except where a Notice of Variation has been issued for a repeater - but even these are subject to careful site clearance). Of course, amateurs need to be careful of how they operate on any band where they are a secondary user. Operation outside the terms of a licence however is unlicensed use and enforcement action (which could mean prosecution and/or revocation) can be expected in these cases. This is particularly so where a safety of life service, the security of which is the RIS's first priority, is at risk."

## Jupiter on 20MHz

A very significant astronomical event is about to occur between 16 and 22 July. Comet Shoemaker-Levy 9, which is unusual in that it is in an elliptical orbit around the planet, not the Sun like most other comets, is due to collide with Jupiter.

Jupiter actually radiates on I.f., h.f., u.h.f. and s.h.f. The h.f. emissions sound similar to 'ocean waves' and are generated by the magnetosphere, which is a phenomenon caused by the planet's strong magnetic field trapping charged particles and extending to many times the diameter of Jupiter. The emissions range in frequency between 0.6 and 30MHz with a peak around 20MHz.

The best set-up for reception of this radiation is a directable beam that can be inclined to follow the planet's position relative to the Earth. However the radiation can be

heard without this complication. As the emission is wide band a wide as possible bandwidth on the receiver is best.

To receive the radiation from Jupiter the planet must be above the horizon, and there are various sources of data on this aspect.

An important point to note is that you must locate a clear frequency. The signal from Jupiter is not constant and the magnetosphere is rotating at the rate of roughly one revolution per every ten hours. Also the emissions are caused by disturbances caused by the position of the planet's satellites, so a rather random nature is given to the radiation.

No one is sure what effect the collision will have on the emissions but it seems highly probable that there will be a catastrophic effect on the red giant. If you start listening now you may well be able to detect the effects for yourself.

## Southern Scanning & Shortwave

You may be aware that Colin Riggs G3XAS and Bob Burrows G6DUN are no longer at the Lowe Electronics shop in Gillam Road, Bournemouth, which has recently closed. They are, however, still very active supplying receiving and communications equipment.

Now trading as independent suppliers of equipment and accessories they are able to supply, direct to you, most makes of equipment, as well as offering a range of used equipment and a 'sell on behalf' service.

For up to the minute information call (0202) 590779 24hr information/order line, or Mobile (0836) 545550.

## Vintage Wireless

An interesting issue of the *Bulletin of the Vintage Wireless Society* dropped on the News Desk this month. Particularly of note are articles on Reflex Circuits and early manufacturing at the Philips, Mitcham, site.

**Membership Secretary: Gerald Wells, Vintage Wireless Museum, 23 Rosendale Road, West Dulwich SE21.**



# news

## New Morse Tutor Software

Using Morse Helper for IBM PC and Compatibles, Morse can be sent using a variety of input methods, either using the key board, mouse buttons or joy stick if available. It is also possible to connect a Morse key to the joystick port or wire it directly across a button of a standard PC joystick to enable this to be used by the student.

System requirements are an IBM PC or Compatible, 8086 processor, 512K RAM and hard disk - joystick and mouse are optional. Current version runs with DOS, but a Windows version is currently under development.

Morse can be decoded at various speeds and takes the form of a series of exercises. Firstly, there is freeform sending practice where the student can send what they want to and the computer will decode and display it on screen. When the session is over a count of letters recognised by the computer is displayed for the student benefit. Secondly the computer will display a text sequence which the student has to repeat. A percentage display of accuracy is displayed to the student at the end.

The program is available in two versions, one for personal use and a club version that will support up to 21 users recording the individual setting and recalling them by name. Morse speeds from 4 to 17 words per minute are provided with user definable word and letter spacing. Sound is played through the computer's built-in speaker, the tone of which can be set by the user. The club version will allow the speed and preference settings of up to 21 users to be recalled individually, to enable the use of the helper by a range of learners.

The software comes with full instructions and is initially available direct from Shoestring Software at the introductory price of £6.99 for the single user edition and £10.99 for the club version. The prices hold until June 30 1994 when prices increase to £8.99 and £14.99 respectively. Dealers are being sought.

A free demo of the program is available upon receipt of a blank formatted 3.5in disk and an s.a.e. from Ian Blair at Shoestring Software, 78 Carmarthen Road, Waun Wen, Swansea SA1 1HS. Tel:



## ISWL

We have been informed by the International Short Wave League that their *Guide to English Language Short Wave Broadcasts to Europe - Summer Schedules 1994* is now available, to both members and non-members. The guide, which is in the form of a 33-page booklet, is available direct from ISWL HQ at the modest price of £1.30 or two IRCs post paid (postage stamps to the value of £1.30 are also acceptable). The guide will also be available from ISWL rally stands. **International Short Wave League, 10 Clyde Crescent, Wharton, Winsford, Cheshire CW7 3LA, United Kingdom.**

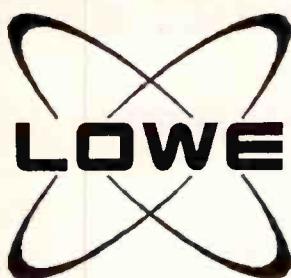
## Gremlins

The gremlins struck with ferocity last month and in consequence we need to set the record straight.

Last month we reported on the News pages that Realistic scanners were available from sources other than Tandy. However, we failed to point out that the range is also available from **SRP Trading, Unit 20 Nash Works, Forge Lane, Belbroughton, Nr. Stourbridge, Worcester.**

**Tel: (0562) 730672 Fax: (0562) 731002 for mail order and SRP Radio Centre, 1686 Bristol Road South, Rednall, Birmingham B45 9TZ Tel: 021-460 1581** for the shop.

We must also thank **SRP Trading** for supplying the Grundig Yacht Boy 400 receiver reviewed on page 25 of last month's *SWM* and not Grundig International as stated.



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Probably the most cost effective receiver on the market today, our HF225 gives you the best combination of facilities, matched with performance and price.

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- ◆ SSB bandwidth: 2.2kHz
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**All for just £479.00**

Optional enhancements:

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- ◆ KPAD1 Keypad controller
- ◆ C225 Leather carry case

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The world's most popular shortwave receiver! Our HF150 is ideal for the beginner or expert alike.

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- ◆ Built-in whip amplifier
- ◆ Compact size
- ◆ Excellent audio quality

**All for just £389.00**

Optional enhancements:

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- ◆ KPAD1 Keypad controller
- ◆ IF150 Computer interface
- ◆ RK150 NEW! Rack'n'stack storage system
- ◆ MB150 Mobile / marine mounting bracket

#### EUROPA



A "turbocharged '225"! The HF225 Europa is probably the best receiver to use if you are a dedicated broadcast band DXer. We've replaced the standard AM filters with 7, 4.5 & 3.5kHz, giving excellent selectivity for winking out those weak tropical band stations. The SSB filter stays at 2.2kHz to allow for exalted carrier reception. We're also fitting magnetically shielded coils and low-noise switching diodes in the bandpass filters which reduces residual noise in the receiver. The Europa model includes the KPAD1 frequency controller and the synchronous detector fitted as standard

**All for just £699.00**

## Lowe Electronics Ltd.

Chesterfield Road, Matlock,  
Derbyshire, DE4 5LE

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IF YOU WOULD LIKE MORE INFORMATION ABOUT THESE AND OTHER PRODUCTS, JUST SEND US FOUR FIRST-CLASS STAMPS AND REQUEST OUR "SHORTWAVE INFORMATION PACK" WE'LL ALSO SEND YOU A FREE COPY OF OUR FAMOUS LISTENER'S GUIDE!

# PR150



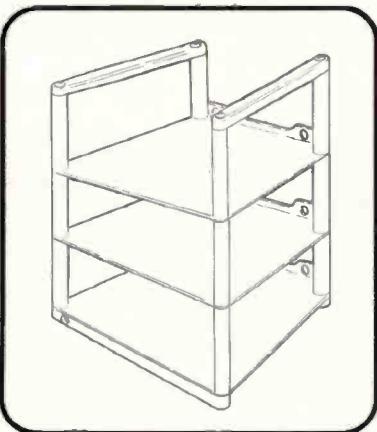
Although initially designed to compliment our own HF150 receiver, the PR150 can in fact be used with any receiver.

The PR150 preselector sits ahead of your receiver and pre-selects a narrow range of frequencies from the wide range arriving from the antenna. This can help to reduce image frequencies and spurious signals in a receiver, sometimes resulting in a spectacular improvement in performance! If you're using a scanner like the MVT7100 for short-wave reception, one of these will really make it work!

Try one out today in any of our branches.

**PR150.....£235.00**

# NEW



What a great way to tidy up your HF150 station! Our new **RK150 Stack'n'Rack** provides the ideal solution to storing your HF150 and accessories. Available as a two tier model for the HF150 and PR150 combination, plus you can buy an extension kit to add another layer for your NIR10, NTR1 or FL3 audio filter, or perhaps for our next accessory.....

**RK150.....£59.95**

**RK150EX.....£19.95**

# NEW! MODEMASTER2

Modemaster has fast become the standard software decoding package for the shortwave listener. Covering FAX, RTTY, Morse, NAVTEX and FEC, this will allow you to decode the majority of signals found on the shortwave bands today. With **MODEMASTER 2** you have access to:

- Current and Forecast Weather Facsimile Maps.
- Weather Forecasts.
- Cloud Cover Pictures.
- NAVTEX and Marine Navigation Warning Broadcasts.
- News Broadcasts and Press Photographs.
- Amateur Radio Transmissions

New features in Version 2 include a new map driven front end and ability to apply false colour to fax pictures - great value at the new lower price - it's now just £139.00!

Or upgrade from V1.0 for just £49.00

**ALL THE GREAT NAMES IN SHORT-WAVE ARE HERE AT LOWE'S...**

**WATKINS-JOHNSON, KENWOOD, ICOM, YAESU, ROBERTS, SONY, RF SYSTEMS, GLOBAL, JRC, AOR, DRAKE,**

## SHORTWAVE ACCESSORIES

Magnetic Longwire Balun	£45.00
NEW!	
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Magnetic Transfer Antenna	£175.00
DXONE Active Antenna	£325.00
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Kenwood HS6 Headphones	£32.95
AT1000 Antenna Tuner	£96.95
Datong AD370 Active antenna	£79.95

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Chatham Road  
Sandling, Maidstone,  
Tel 0622 692773

**NORTH EAST**  
Mitford House  
Newcastle Int'l Airport  
Newcastle upon Tyne  
Tel 0661 860418

**EAST ANGLIA**  
152, High Street,  
Chesterton,  
Cambridge,  
Tel 0223 311230

**OPENING HOURS MON - FRI: 9.30 TO 5.00, SAT: 10.00 TO 4.00**

# BBC Monitoring

Maybe a good many of us tend to think that the British Broadcasting Corporation is primarily, for what its name implies, one of the major radio broadcast organisations that provide us with entertainment, information and educational content 24 hours a day. However, a lesser known, but nonetheless important function of the BBC, is its extensive monitoring facility for the interception and processing of worldwide radio and TV broadcast signals. Such is the importance of BBC Monitoring (its official title) in this news gathering capacity, that a Grant in Aid of £15.9m is made by the UK Foreign Office for the running of this service, at present located both at Caversham Park, Nr. Reading, Berkshire and 7km north at Crowsley Park, Oxfordshire.

## Wartime Origins

Originally established prior to the outbreak of war with Germany, in August 1939 at Wood Norton, Nr. Evesham, Worcs, as a potentially useful source of news and intelligence from non-UK sources, its reputation was legendary during World War II, with such 'scoops' as picking up signals from the Nazi's newest radio teleprinter network. Goebbels, the head of the German propaganda ministry at that time, had established an extensive 'Hellschreiber' (an advanced German form of radio teleprinter, forerunner of present day RTTY) network for the rapid



**Operations Room at Caversham.** ©BBC World Service

transmission via the news agency DNB for the distribution of news and propaganda throughout Germany and occupied Europe. It was through the acquisition of some of these machines that BBC Monitoring was able to access invaluable information originating from Goebbels' ministry. After translation and editing at Evesham, the bulletins would be immediately dispatched via direct teleprinter line to Churchill and his cabinet at No. 10 for analysis. Quite apart from this specific scoop, other information gathered from monitoring was of invaluable use to the Allies during the war. Thus its contribution to the war effort should not be underestimated and it should also be remembered that all the monitoring was performed on what we would now view as some pretty primitive radio

receiving equipment, mostly home-brew receivers developed by BBC engineers. No luxuries were available then such as synthesised receivers with digital read-outs and multi-frequency memory banks. Audio filtering was unheard of, which says much for the skilful copying and translation by the multi-lingual monitors. Recording, when required, of the more important material received, was performed on early recorders using wax cylinders which were subsequently 'shaved' to be re-used, the average life being about 50 recordings. But due to increasing unevenness of the cylinder surface during use, playback quality would inevitably suffer.

## A New Home

Due to the problem of ever increasing electrical

interference and the need for better accommodation, a move was made in April 1943 from Evesham to its present imposing headquarters at the former Oratory School, Caversham Park, Reading for the editorial and administration staff and nearby Crowsley Park for the remote reception and extensive antenna systems needed for the primary interception of signals. The latter side being carefully chosen at the time, for optimum reception conditions such as good earth conductivity and low levels of electrical interference. At its peak wartime compliment of 600 staff, the Caversham operation monitored over one million words every 24 hours and since then, extensive monitoring has taken place of world-wide sound and television broadcasts providing valuable news to the media and Government,

# Service

**Philip C. Mitchell**

sometimes during conflict, as in the Falklands and Gulf Wars, when the building up of accurate pictures is required of the political and military scene in the enemy camp and changes of political structure are needed. Today, BBC Monitoring with a total of 450 staff, forms part of the BBC World Service and apart from Government defence communication monitoring, it is one of the largest and best operations of its kind in the world. An agreement signed in 1948 with its American counterpart, the Foreign Broadcasting Information Service (FBIS), a United States government agency, has further strengthened the effective exchange and distribution of primary global monitored news and as the BBC World Service, BBC Monitoring, together with FBIS currently monitors radio broadcasts in over 70 different languages from over 140 countries.

## The End Product

Quite apart from the invaluable use to the BBC as a world-wide news gathering organisation, its Monitoring Services publishes three editorials. A rapidly accessed daily teleprinted news summary *Newsfile*, via facsimile, telex or direct line, of up to 12 000 words, customised to subscribers requirements, two printed publications, a four part 100 000 word *Summary of World Broadcasts*. On a more technical level, a weekly published *World Broadcasting Information*, giving a veritable mine of information on transmission schedules and general broadcasting news, including satellite broadcasts, is of particular interest to the DXer. As a commercial marketing operation, all of these services are available world-wide on subscription from BBC Monitoring, Caversham Park, Reading, Berks RG4 8TZ.

**WBI**  
WORLD BROADCASTING INFORMATION

BBC  
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and  
Transmission Schedules

Summary of World Broadcast Media - *World Broadcasting Information*. A mine of information for the DXer. ©BBC World Service

## Finding The Signals

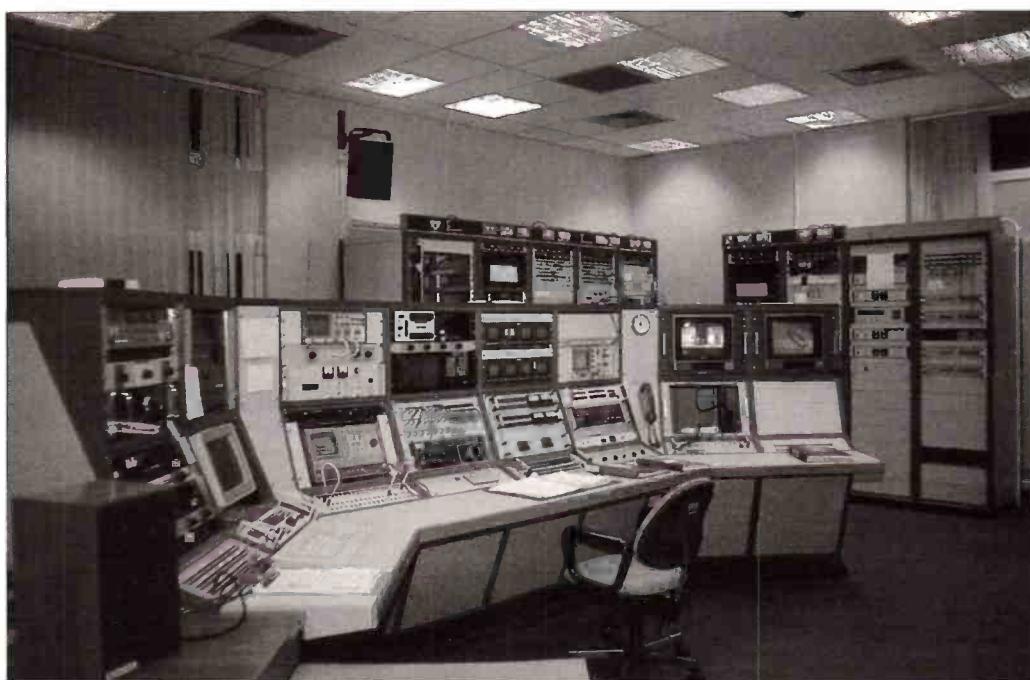
As previously mentioned, the initial interception of broadcasts is made at Crowsley Park, Oxfordshire, 7km to the north of Caversham Park at the former Baskerville estate, where it is said Conan Doyle was first inspired to write *The Hounds of Baskerville*. It is here that the main receivers are housed with their associated extensive antenna systems to receive the required broadcasts and correctly route them via land line to Caversham Park for translation and editing.

## Crowsley Park

The primary interception of signals at Crowsley Park, Oxfordshire is conducted on a level, isolated rural site of some 240 acres in what is becoming a rarity these days, a comparatively electrically quiet area with low interference levels. This large site was also chosen to accommodate the extensive antenna systems needed, some of which are nearly 1km in length, together with the satellite dishes installed later.

## Signal Interception

The main purpose-built building, receives and processes the signals before being relayed by land line to Caversham Park. With a total of 32 operational and engineering staff to maintain and operate the complex on-site equipment, Crowsley is undoubtedly a DXers paradise! Within the main building, the primary reception and correct routing is carried out in the Engineering Interception Room in accordance with the requirement schedules received from Caversham



Console for reception of satellite TV and analysis of signals  
Technical Operations, Crowsley.  
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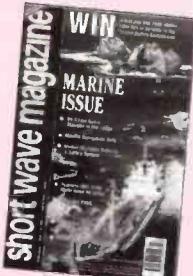
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and ensures that the correct signals are routed on the right lines to the main monitoring area. The main signal racks contain a total of 35 Racal 1792 and 1772 receivers which can be fed from any one of a total of nine different antenna systems by the operations staff for optimum reception conditions. Selection of these can be made from six Beverage long wire antennas of varying lengths up to 1km, two Curtain Arrays of different heights and a Rhombic aerial. Within the reception area, the output from an additional RA1792 receiver is used to prepare a 'Band Scan' to record in graphical form, the occupancy of each band or broadcast frequencies in current use. The information obtained enables the BBC World Service to choose the best location of their frequency



Engineering Interception Room showing console and rack mounted Racal Communications Receivers types R1792 and R1772 and other equipment. Technical Operations Crowsley. ©BBC

slots in future planning. Also installed is a pen recorder continuously monitoring signals via a

Racal RX RA1771 from a good stable source, in this case Suddeutcher Rundfunk 6030kHz, to indicate the existence of SIDs, (sudden ionospheric disturbances) during transmission times.

**Fig. 1** shows a trace of a SID between 1115 and 1205UTC on 27 June 1993 and will be significant in confirming interruption in the reception of signals at that particular time of day.

It is proposed that in 1994 the present Racal receivers will be replaced by Watkins-Johnson receivers, remotely controlled by the monitoring staff from Caversham. The front control panel only (WJ8711) will be installed there, whilst the receiver (WJ8712-1) will be fitted into the Interception Room at Crowsley Park. This will ease communication problems at present arising on the receiver side of things between Caversham and Crowsley.

## Satellite Reception

Extensive monitoring of satellite radio and TV signals also takes place at Crowsley. Signals from four main satellite dish antennas (two C band, one Ku band and one C and Ku band) receiving signals from over 35 satellite programme sources are fed to a separate console for selective display and analysis by a Hewlett Packard spectrum analyser (which aids the location of signals) and re-routing via eight video lines to Caversham. **Fig. 2** shows the position of satellites which could be monitored. Additional dishes are also installed at Caversham for direct radio and TV reception there.

## Caversham Technical Operations

Signals routed from Crowsley are distributed to various monitoring staff for translation as dealt with earlier in this article. However, two console

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INTELSAT 602	63°	E	Ku
INTELSAT 604	60°	E	Ku
INTELSAT	57°	E	
GORIZONT	53°	E	C
GORIZONT 12	40.5°	E	C
ARABSAT 1C	30.5	E	C
DFS 2 KOPERNICUS	28.5°	E	Ku
DFS 3 KOPERNICUS	23.5°	E	Ku
EUTELSAT 1 F5	21.5°	E	Ku
ASTRA	19.2°	E	Ku
EUTELSAT 11 F3	16°	E	Ku
EUTELSAT 11 F1	13°	E	Ku
EUTELSAT 11 F2	10°	E	Ku
EUTELSAT 11 F4	7°	E	Ku
TELE-X	5°	E	Ku
TELECOM 2	3°	E	Ku
THOR	0.8°	E	Ku
INTELSAT 512	1°	E	Ku C
TELECOM 2B	5°	W	Ku C
TELECOM 2A	8°	W	Ku C
GORIZONT	11°	W	
GORIZONT	14°	W	
INTELSAT 515	18.5°	W	Ku
OLYMPUS	19°	W	Ku
TDF 1/2	19°	W	Ku
TV-SAT 2	19°	W	Ku
INTELSAT 601	21.5°	W	Ku C
INTELSAT	24.5°	W	
INTELSAT V1	27.5°	W	
HISPASAT 1A	30°	W	
MARCOPOLO 1	31°	W	
INTELSAT 504	31.4°	W	
INTELSAT	34.5°	W	
PAS-1	45°	W	Ku
INTELSAT 513	53°	W	C

suites are located in the 'Listening Room' at Caversham under the control of a Senior Technical Operator. One to check and verify incoming signals from Crowsley and the other a research console. The latter is fully operational for 16 hours daily and maintains a listening watch for new frequencies and alterations in schedules to be passed on in the form of a listening log to editorial staff for publication. One technique in use is that of split headphones to determine the position of simultaneous h.f. broadcasts and their relative movement from time to time. Two standard Racal 1772 receivers located at Crowsley but remotely controlled at the research console, are fed to a headset. The input from one receiver is fed to the left earpiece and the other to the right. The known reference broadcast frequency is tuned into one ear and the particular frequency of interest is manually scanned by using the other receiver in the other ear. An identical signal received will be checked off against existing frequency schedules of verification or logged as a new frequency.



Steerable satellite dish for reception of TV signals. Technical Operations Crowsley ©BBC

### RTTY Reception

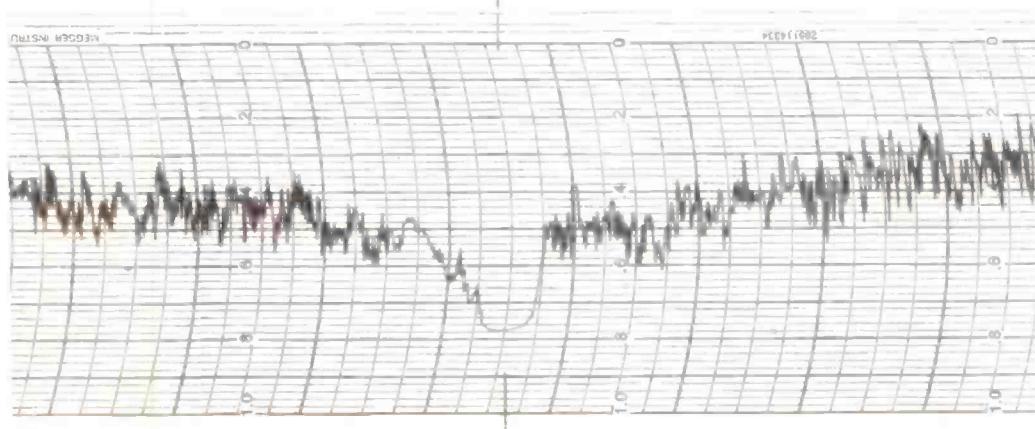
Other technical operations at Caversham include a News Agency Section receiving RTTY broadcasts from European and overseas sources such as Romania (Rompress), Yugoslavia (Tanjug) and Moscow (Itar-Tass), the latter via Intelsat. 12 Crowsley based receivers feed via landlines into 12 Hagenek 7223 demodulators, the output of which is stored within a mainframe computer database prior to editing by

the newsroom. All non-English RTTY broadcasts need to be translated before editing.

Whether in peacetime or in periods of crisis, the gathering and processing of news is an essential part of life and in no other way is it performed so efficiently and with such speed as through the medium of broadcasting. BBC Monitoring has, through its professional staff and technical ability, developed this service to a high degree and has acquired a world-wide reputation in so

doing. Assistance from all the staff of Technical Operations BBC Monitoring in the preparation of this article is gratefully acknowledged.

Fig 1. Sudden Ionospheric Disturbance (SID) at X X recorded 27 June 1993. Broadcast signal from Süddeutscher Rundfunk 6030kHz. ©BBC World Service

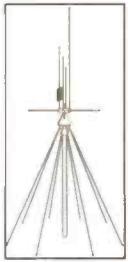


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# Second Post!

Our postbag was so full last month that we've put an extra page of letters in this issue.

## Dear Sir

Re: The review of the Philips model AE3905/00 World receiver and information regarding ICF SW100 Sony digital world receiver.

I have been listening to short wave stations around the world for some time now, using my Philips AE3905/00 digital world receiver. To be very frank with you I have been unknowingly dragged or simply sucked into 'The Vortex of Black Hole DXing'.

I have been a regular reader of *Short Wave Magazine* since January 1994 when I got hold of a copy by accident. I would like to take this opportunity to thank you for your hard work in maintaining the standard of *Short Wave Magazine*.

I read the May 1994 issue and I very much appreciated the article that was published in it regarding the review of the Sony ICF SW100 World Band Radio. And it was regarding this receiver that I wanted to ask you certain questions.

Firstly, at the back of ICF SW100 there is the strange symbol shown below.

Would you be kind enough to tell me, what is the meaning of this symbol - technically, or otherwise?

As I said earlier, I have been using the Philips AE3905/00 digital world receiver, and this miniature radio has also a similar symbol on the back of the radio, but it has different characters. I would be very much obliged if you could shed some light on this symbol.

I hope you will consider this letter of mine sympathetically and do the needful, until then, happy DXing to all.

S.K. Nathalal  
Slough  
Berkshire



## Dear Sir

I reply to a letter from a T. A. Smith in the May 1994 edition of *Short Wave Magazine*. I can, after 24 years, 'dial twiddling' as my late mother once called it, appreciate the problems that this reader is having with interference.

I would agree that there is too much pollution of the 'r.f. spectrum' from all sources. It does not matter if it's domestic or industrial, 'r.f. pollution' is much too high and not just in towns and cities, it is spreading like an unstoppable cancer across the country, and the world.

And every new gadget that comes on the market makes more, mainly to l.f., m.f. and h.f., although I understand v.h.f. and u.h.f. get affected with this 'r.f. spectrum' pollution.

When I first began 'dial twiddling', the solution seemed easier. One just moved the shack and/or the aerial and that helped. But today, with so many gadgets, both domestic and industrial, it's not so easy as I have found.

I have another problem, with over five televisions within four metres of my shack. I have attempted to move the shack three times,

only to find that I am getting interference from the house next door, either from their television, computer, or some other domestic gadget. I have also noted that there is some interference from some sorts of street lighting as well as telephone lines and even my own cordless phone, mainly around 3.364MHz which is in the middle of the 90m band (3.2-3.4MHz). The list is never ending. Even those electronic lighters for cigarettes can cause a loud click, even on the television next door as my wife found when lighting her cigarette. So it's not only radio enthusiasts that put up with pollution of the 'r.f. spectrum', it's everybody who uses it.

As we all must be aware, radio enthusiasts or 'dial twiddlers', as we were once called, are in a minority as users of the 'r.f. spectrum' compared to television viewers and yes, I know there are over 340 million radio's compared to only 160 million televisions in Europe. But, I did write 'Enthusiasts' which does not include those people who listen for purely domestic reasons. Also, if you add onto the 160 TVs, the computer games, computers etc., then we are in a minority. So, to

expect people to listen to our talk of woe is going to be an uphill climb, all the way to the top.

Add to Mr T. A. Smith's comments about hearing 'what programme they are watching', he mentions a frequency of 5995kHz, this is close to, from what I can remember, the sound i.f. of (nominal) 6MHz of a television set. I would think that this TV needs an i.f. re-tune or trim. As it's sound i.f. stage is off frequency.

It is my personal view, that the powers-that-be might turn a blind eye to this type of interference is that they need this output from the i.f. strip to detect TV licence dodgers. As they need to know what programme they watch before they take action.

But who is to blame? Is it the government or its departments, the manufacturers, the designers or the humble or innocent owner of the offending equipment.

So, if a group was set up it would need, in my opinion, all interested parties, us, the 'dial twiddlers' as well as those mentioned above as the 'r.f. spectrum' belongs to everyone, users and offenders alike.

Furthermore, if one takes a look at the back of a TV licence, it states that TVs should not cause interference etc. to other users. Also, on making enquiries with the DTI they will investigate such interference, I would think at a cost, so that could be of help in the future if all else fails.

Perhaps a small amount of space in a respectable magazine like *Short Wave Magazine* would be of help with advice, etc. to us 'dial twiddlers', but that would be up to the Editor!

On another matter on providing your readership with a more complete magazine, with the Propagation Forecasts. We've waited too long for this service. I hope you will continue with these, but could someone at *SWM* give an explanation of which each line means as this might help your junior readers to understand them and increase their usefulness.

R. J. Reynolds  
Guildford  
Surrey

We have complied with the last request - see page 51. Ed.

## Dear Sir

A plea for help. I have just acquired a aircraft receiver (R1155) which is ninety percent authentic, i.e. has not been modified in any way, or made into a self contained unit.

The ten percent missing is the meter balance control with nut locking device, control knob and stopper arm, located in the top left hand corner of the set.

Secondly, the Jones plugs. I would like to obtain securing strip along with the two pegs that secure the Jones plug sockets against vibration. If anyone has two eight socket type plugs and one four pin plug I would be thankful to hear from them. These are located at bottom right hand corner of the set, they connect the 1154 transmitter to the R1155 receiver.

Anyone that has modified an 1155 would no doubt have discarded these items to make way for a fuse link, speaker hole or whatever, and still have them around in a box of junk.

I am willing to pay for these items even though I am an OAP. I intend bequeathing this set to a museum. I have built an external power pack for it and the set does work.

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VHF Convertor (Internal) .....	£225.00

**Price £995.00**  
inc P&P

## SCANMASTER - HIGH QUALITY ACCESSORIES

### SCANMASTER BASE ANT.

New high quality wide band receiving antenna uses fibre glass/stainless steel, with 4 small radials. 'N' type connector. Length 1.1 mtr. .... **£39.95**

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A fully adjustable desktop stand for use with all handhelds fitted BNC and Coaxial fly lead.... **£19.95**

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A high performance wideband antenna offering gain over a conventional discone. Stainless steel construction with mounting kit and short pole.

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Note:- Add £4.75 P&P on all Antennas

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A combined desk stand and power supply / charger for handheld scanners. Suitable for most popular models. Special versions available please call for details

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A 9V version for most Tandy and new Comtel Scanners

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Recognising what's needed in modern receiver design, Drake have incorporated a quality large front-mounted speaker, direct frequency access keypad, four antenna inputs and complete portability with a fitted telescopic whip antenna and optional NiCads. Also included are 70 programmable memories, a dual mode clock timer, synchronous AM detector and, of course, a 240AC adaptor.



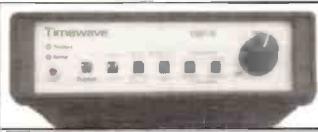
£599

## NOISE KILLERS

### DIGITAL AUDIO FILTERS

#### FROM TIMEWAVE TECHNOLOGY USA

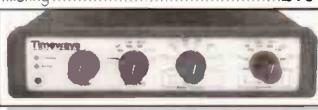
Eliminates Heterodynes, reduce noise & interference, produce razor sharp audio! Both TVW DSP filters feature third generation 16-bit processors for unmatched performance. Multiple filter combination provide simultaneous noise reduction, automatic search & elimination of heterodynes and QRM removal. FIR linear phase filters minimise ringing, prevent data errors and produce razor sharp audio.



#### TIMEWAVE DSP-9

CW/SSB filter. New version 2 has better noise reduction. AGC & tighter SSB filtering.....

VER 2  
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Multi-mode filter including Packet, Amtor, RTTY and the NEW GTOR modes. Incorporates multiple automatic notch filter. ....

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Replacement ROM Chip turns your old model into New Version 2 for just .....

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**NEVADA MS1000** As a general wide band scanning receiver, the MS1000 fits the bill from Radio Peking on Short Wave to High Band 900 MHz, this model comes with the lot! Order yours NOW! - and save an incredible £30 off list price! -



SAVE  
£30

£269  
£4.75 p&p

#### Features Include:

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- ★ 1000 Memories
- ★ Automatic Tape Switching
- ★ Audio Squelch
- ★ Tape recorder socket
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SHOWROOMS:- 1A MUNSTER ROAD, PORTSMOUTH PO2 9BS

MAIL ORDER:- 189 LONDON ROAD, PORTSMOUTH PO2 9AE

## RECEIVERS

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Icom R71E Short Wave Receiver	£895

### KENWOOD

R-5000 [100kHz-30MHz]	£899.00
-----------------------	---------

### YAESU FRG-100

Compact Shortwave Receiver, ideal for both beginner & Pro alike! Comes complete with free P.S.U. ....

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### ROBERTS

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RCB18 Multi band w/cass	£199.99

### SONY

As a Sony Shortwave Centre we carry the full range of Portable Radios - Here is a selection:

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SW33 Portable SW+VHF	£139
SW1E Pocket S/Wave	£179
SW7600 Popular MultiBand	£179
AN1 SW Active Ant.	£58
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### STEEPLETONE MBR8

Top of the range multi-band radio, covering the usual LW and MW bands together with VHF Air & Marine Bands plus Shortwave Broadcast Bands. AM Direction Finder Ant., Mains/Battery. Price ..... **£89.95**

NEW MODEL



### STEEPLETONE MBR7

We have a few of this "Jumbo" Radio left in stock. It offers facilities similar to the MBR8 & is available at .....

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### SANGEAN ATS803A

A full coverage Short Wave Receiver with AM, FM & SSB reception. This model is an ideal choice for the newcomer to short wave listening. It



features excellent sensitivity and filtering - couple this with easy push button programming and direct BFO tuning for SSB, and it's no wonder it has become our most popular low cost receiver. Order yours now and we will supply you, free of charge, a mains adapter worth £14.95 Price .....

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Comtel 204 base scanner	£185.00
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Fairmate HF200E average cond	£195.00
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Goodmans AT8 802 pocket S/W RX	£40.00
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M-50 Wide Band Pre-amp	£30.00
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Kenwood RZ1 mobile scanner	£315.00
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MS1000 base scanner	£199.00
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MS8400 SMC Desktop Scanner	£120.00
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Pro 37 hand-held, average cond	£140.00
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Pro 46 hand-held scanner	£150.00
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Pro 2005 base model, full cov	£185.00
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Pro 2021 base scanner	£125.00
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Pro 9200 base scanner	£110.00
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Sangean ATS803A bxd.vgc	£95.00
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Sony 2001 Portable S/W RX	£120.00
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Yaesu FRG9600 scanning RX	£365.00
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Yupiteru VT-225 average cond	£175.00
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Yupiteru MVT-6000 scanner	£175.00
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Yupiteru MVT-7000 hand-held, boxed	£239.00
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### Shortwave receivers

Icom R700 c/w remote control	£695.00
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Sangeon ATS-803A boxed	£95.00
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Sony SW7600 Pocket RX with SSB	£105.00
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Sony 2001 receiver	£120.00
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Trio K600 general cov receiver	£225.00
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Yaesu FRG7700 + FRAT7700	£425.00
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Yaesu FRG8800 + fitted VHF	£595.00
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Yaesu FRG9600 choice of two	£375.00
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Yaesu FR7700 matching tuner	£50.00
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HF Transceivers	
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Oriole TR-1 + PSU/MS7 Spkr	£965.00
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Icom IC701 + PSU, boxed, vgc	£495.00
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Icom IC730 mobile HF TX	£495.00
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Icom IC737 ex-demo, as new	£1325.00
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Icom IC765 Superb HF Base	£1995.00
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JST 135 HF TX/RX 150W PEP	£775.00
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Kenwood TS120S + VF0120	£495.00
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Tokyo HT115 15m monobander	£185.00
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Trio Z2006 2m Rockbound Rig	£125.00
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Trio Z2006 2m Rockbound Rig	£335.00
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Trio FT One HF Base Tx	£995.00
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Trio FT102 vgc	£795.00
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Yupiteru FTG76X c/w PSU	£595.00
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Yupiteru F902 complete line-up	£699.00
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### Mobile Transceivers

Trio TS700S 2m 10W base m/mode	£445.00
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Yupiteru FT290 Mk1 2m m/mode (x3)	£275.00
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Yupiteru FT290 Mk1 2m, Mutek FF	£325.00
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Yupiteru FT290 Mk2 boxed, vgc	£395.00
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Yupiteru FT690 Mk1 6m, boxed, vgc	£350.00
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Yupiteru FT690 Mk2 boxed, vgc	£425.00
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Station Accessories	
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Adonis DJ180 2m Handle	£45.00
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Copco desk top SW loops (pair)	£65.00
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Datron FL1 Filter	£60.00
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Datron FL3 Filter + PSU	£85.00
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Dating L7 Morse Tutor	£55.00
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Drake L7 Amp, very rare (SOB)	£1100.00
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ERA Microreader, early version	£85.00
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Kenwood RC10 Rem controller	£149.00
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TMA Auto notch filter	£39.95
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Tokyo ATU 200W with meter	£95.00
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Tono 550 data term + monitor	£245.00
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Yupiteru FC102 ATU, good cond	£175.00
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Yupiteru F902 matching ATU	£165.00
----------------------------	---------

The above is only a representative list of the type of secondhand product we stock. Actual items change daily - please call for the latest stock situation. We offer generous part-exchange - call us now for a quotation.

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Simply divide the price into 3 equal payments. Write 3 cheques dated in consecutive months starting with today's date. Write your telephone number and cheque card number on the back of each cheque. Post them to us, enclosing your name and address and we will supply you, free of charge, a mains adapter worth £14.95. Price .....

**£129.95**

# Mellow Fifteen Fifty Seven!

*Mellow*  
**1557**   
 Medium Wave Radio

There is at least one G1 who can transmit on frequencies below 50MHz, in fact he can legally transmit on frequencies that, possibly, no other radio amateur can use! Bill Rollins G1WJR is a Presenter at Radio Mellow, broadcasting on 1557kHz in the medium wave band. Jeff Harris G3LWM explains some of the technicalities of a local radio station.

**M**ellow Radio is a member of the Southern Sound Radio Group of companies who operate stations in the south of the UK. The studio and offices of Mellow are located in a modern building at Frinton-on-Sea, Essex, and serves a broadcasting area bounded by Felixstow, West Mersea, Colchester and Manningtree. The transmitter and antennas are sited at Little Clacton, some 5km inland from Frinton-on-Sea. The building that contains the studios was originally custom made to house a production company specialising in audio tapes for commercial advertising and is therefore very well suited to its present use. Going through the reception area, the ground floor is divided into two areas.

## Broadcasting Studio

A Pye TVT Broadcast Station Console dominates the Broadcasting Studio. A boom-mounted microphone with its wind shield is mounted just above the control position. The Presenter on duty has complete control of the audio output of the station. Inputs, again under control of the Presenter, consists of outputs from the Microphone, Twin Turntables for conventional records, CD Player, Cartridge Tape Player for Commercials, BT 'Music Line' to Input programmes from Invicta Radio and input from a satellite for direct off-air ITN News broadcasts. Inputs for real time interviews from the telephone or radio links could easily be set up, but at present this is not carried out and is not permitted under the terms of Mellow's licence. The presenter



The Frinton Studios of Mellow 1557.

has peak audio VU meters to check the audio levels. In addition he can monitor the audio output line and off-air monitor on the stations frequency. In a small radio station, the Presenter is the compiler and editor of his own programmes and these have to be carefully-planned but still give the impression of spontaneity!

In the hard commercial world of today, a local radio station will only survive if it attracts sufficient advertising. Naturally a wide range of local adverts are broadcast. These can consist of simple announcements to a fully produced advert either produced by Mellow in its own studio or from a tape supplied by the client. Networked radio advertising is now carried out in a very modern manner. Let's assume that a market leading confectionery company has just launched a new chocolate bar and they wish to raise customer awareness on a national level. The advert is produced and air time booked. Digital audio tapes are then

sent to one of the satellite operators. At a predetermined time, the advert is broadcast on a dedicated sound channel and recorded by all the local radio stations participating in the campaign. The individual radio stations are advised by Satellite Media Services of the time that the commercial will be transmitted. The information is available on an audio sub-carrier via the Intelsat V1F4 Satellite, on Channel 69 Horizontal. The audio is digitally encoded using the DAT200 Digital MPX System. This information is presented on a dedicated printer. The commercial is recorded on a digital audio tape machine and then transferred to a conventional cartridge for transmission by the station at the required time.

A licence requirement demands that the output from the station is recorded and retained for a period of six weeks. Dedicated equipment for this purpose is expensive so Mellow utilise a modified video tape recorder using

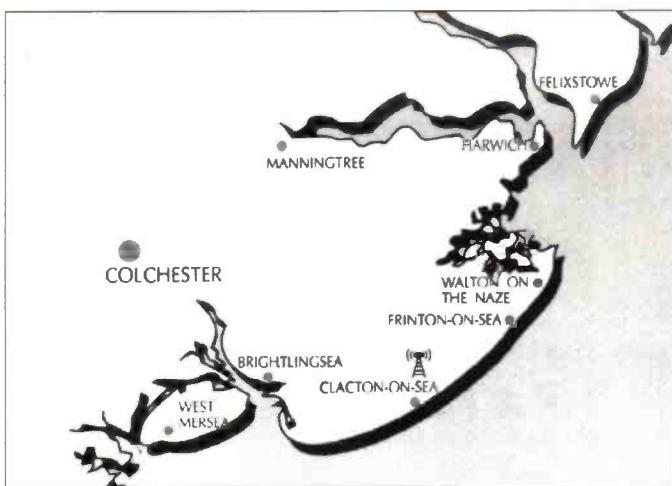
standard four hour video tapes to record the audio output of the station but running at a reduced speed to give eight hours of recording time. As the start and stop time of these tapes is noted, it is an easy matter to find any required section that might contain suspect material!

## The Studio

A small, but fully equipped, studio can produce advertisements or features. These are recorded on standard 1/4in audio tape and full editing features are available. The satellite receiver, digital audio tape machine and other equipment are located next to the studio.

## The Rack Room

The name 'Rack Room' is taken from the old days of broadcasting when radio stations would have a room with a number of Post Office racks. Well, there is a rack in the rack room! This contains a Racal RA17 receiver to monitor off-air 1557kHz signals and circuitry to interface the Input and Output signals to dedicated BT 'Music Lines'. These are private rented lines that are designed to carry Broadcast Quality (a.m.) signals from the studio to the transmitter. The bandwidth is 10kHz, noise, crosstalk, intermodulation, impedance and level are closely controlled, meeting the requirements of BT Specification EPS81 (see later). Peak level audio clipping is introduced at this point on the outgoing signal. This line is routed to Frinton Exchange, then to Clacton before eventually terminating at the transmitter site.



The area served by Mellow 1557.

## Antenna and Site

It was originally intended to locate the transmitter on a coastal site at Holland-on-Sea (MF on map) but this site was required by TNS (Thames Navigation Service) for a radar installation, so the present transmitter is at Little Clacton.

The antenna is a 49m mast radiator fitted with a 140° wire reflector. This reflector was originally fitted to minimise propagation over the sea. However, in its present position, whilst certainly affecting the polar diagram, it has the unfortunate result of reducing the signal to such an extent in Clacton and Frinton that, during the hours of darkness, continental stations are received at greater strength than the local radio. This will come as no surprise to radio amateurs! As the mast is also the radiator, the problem of r.f. feeding back into the mains 230V a.c. supply is overcome by using a special toroidal transformer. The r.f. is fed to the base of the mast via 50Ω coaxial cable.

## Transmitter

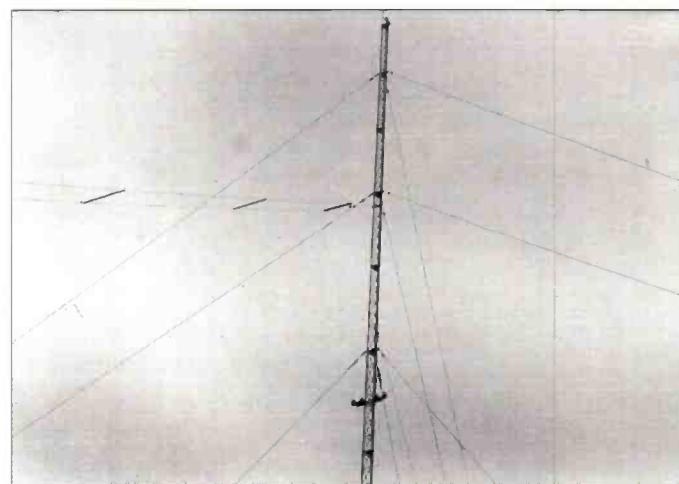
The transmitter is an American MW-1 1kW unit manufactured by Harris. It is operated at the much reduced power of 125W e.m.r.p. to comply with the licence requirements.

An OPTIMOD-AM Compressor/Limiter is fitted between the Audio Input and the transmitter modulator. This consists of a broadband compressor, followed by a six-band (a.f.) limiter to produce the highest average

modulation levels into the transmitter modulator. Included in the Optimod is a sharp cut-off audio filter at 4.5kHz, which is the standard adopted by European broadcasters.

The Radio Authority lay down the rules for Independent Radio Companies to observe. The spectral occupancy of the signal is set by the sidebands not exceeding -20dB at more than ±7.5kHz from the normal carrier and -40dB at ±9kHz from the carrier. Spurious and harmonic emissions must be better than 40dB below the carrier. The carrier must not drift more than ±10kHz. A monitor point must be provided on the transmitter to observe the r.f. output.

In spite of commercial pressures technical standards are being maintained and improved. The future of local broadcasting will keep in step with future developments.



The top of the Mast Radiator

My thanks to the staff of Bill G1WJR, Paul Maclarens the Chief Engineer, all the staff of Mellow 1557, Stuart Vint of the Engineering Department of Invicta Radio for valuable technical assistance and British Telecom for their prompt response to my request for the Music Circuit specification.

## Transmit Station

Presented via a transformer for line impedance matching and isolation. Line buffer amplifiers with zero gain can be provided, for an additional charge, at the transmitting end to provide 600Ω terminating impedance, allowing monitoring facilities without adverse effect on the signal.

## Receive Station

Terminal Amplification undertaken by BT with amplifiers and equalisers

installed at customer premises. Equipment is installed within racks at larger sites and at smaller sites within an equipment case.

Exceptionally, circuits can sometimes be pre-equalised to the customer from the last BT exchange, requiring only isolation/matching transformers to be installed at the customer's premises.

Information courtesy of British Telecommunications Visual and Broadcast Services Division, 1992.

## Radio Authority Incremental ILR Stations.

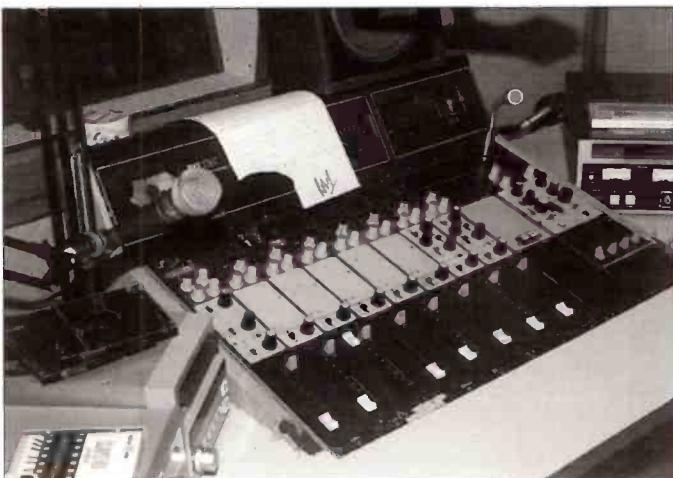
### Specification for MF Transmitting Equipment.

Incremental stations are those that provide additional coverage in areas already served by a Local Radio Station.

## Specification for BT Music Circuit EPS81

<b>Bandwidth:</b>	0.01 - 10kHz		
<b>Terminal Impedance:</b>	600Ω		
<b>Insertion Loss:</b>	under 40km	±1.0dB	
	over 40km	±1.5dB	
<b>Gain/Freq Response:</b>	0.05 - 0.125kHz	+0.75 to -1.0dB	
	0.125 - 8.5kHz	±0.75dB	
	8.5 - 10.0kHz	+0.75 to -3dB	
<b>Group Delay/Frequency Response:</b>	0.05kHz	26ms	
	0.1kHz	8ms	
	10.0kHz	3ms	
<b>Single Tone Interference:</b>	(Unweighted)	-73dBmO	
<b>Noise:</b>	(Weighted) 0 - 40km	-35dB	
		-45dB	

The EPS 81 10kHz Mono Circuit is perfectly adequate for speech and TV sound and is also used for medium and long wave transmitter feeds.



The control console in the studio.



Bill G1WJR spinning a platter!

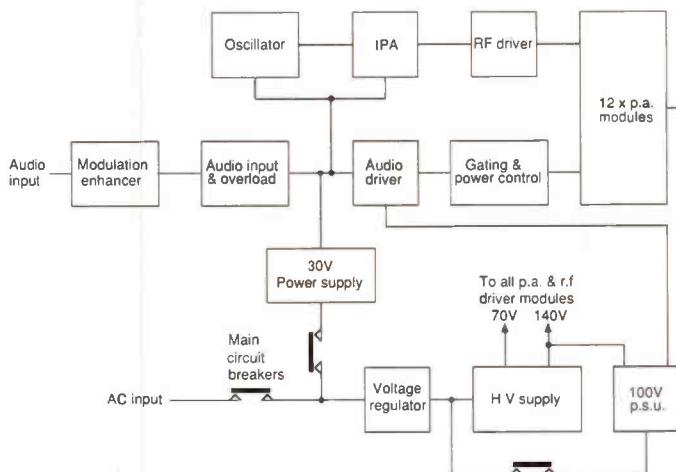
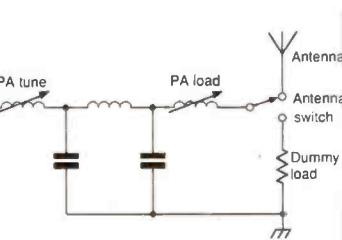


Fig.1: Simplified block diagram of the 1kW Harris transmitter used by Mellow.



modulation depth continuously.

## Modulation Spectrum

Sidebands at frequencies more than  $\pm 7.5\text{kHz}$  from the nominal carrier frequency shall not exceed a level of 20dB below carrier and those more than  $\pm 9\text{kHz}$  from the nominal carrier frequency shall not exceed a level of 40dB below the carrier. To ensure this is achieved, an audio low pass filter must be included in the signal path, after the limiter.

## Spurious and Harmonic Emissions

With the transmitter operating at its specified power into its designated load impedance, the power of any spurious or harmonic emission shall not exceed a level of 40dB below carrier level.

## Programme Material

Programme material shall not comprise analogue signals confined to the nominal frequency range 0 to 6kHz. The transmission of scrambled signals, data or stereo material is not permitted.

## Transmitting Antenna System

The radiation pattern of the transmitting aerial shall be in accordance with the details set in the contract.

## Effective Radiated Power

The transmitted e.m.r.p. (relative to a short monopole), derived from the transmitter

## Abbreviations

%	percent
a.c.	alternating current
a.f.	audio frequency
a.m.	amplitude modulation
BT	British Telecomms
CCIR	Comité Consultatif International des Radiocommunications
CD	Compact Disc
dB	decibels
e.m.r.p.	effective mean radiated power
FCC	Federal Communications Commission
Hz	hertz
ILR	Independent Local Radio
IM	intermodulation
in	inch
ITN	Independent Television News
kHz	kilohertz
km	kilometres
kW	kilowatts
m	metres
MPX	MultiPleX
p.s.m.	progressive series modulation
r.f.	radio frequency
V	volts
VU	Volume Units
°	degrees
°C	degrees Celsius
Ω	ohms

## Radio Regulatory Requirements

### Safety

The transmitting installation must comply with IEC215 (Safety Requirements for Radio Transmitting Equipment) Measures must be taken to prevent operators, or members of the public, being exposed to electromagnetic radiation fields in excess of those currently recommended by the National Radiological Protection Board.

### Transmitter Frequency

The transmitter will operate on an assigned frequency within the band 525 to 1603kHz.

The actual carrier frequency will be a multiple of 9kHz to conform with international channel spacing. It must remain within  $\pm 10\text{kHz}$  of the specified frequency at all times. The transmitter shall be provided with an internal control to allow the frequency to be adjusted over a range of  $\pm 100\text{Hz}$ .

### Transmitter Power

The transmitter r.f. power shall not exceed the value specified in the contract by more than 1dB (26%). The transmitter must incorporate a suitable meter indicating the r.f. output power.

### Modulation

Double sideband amplitude modulation (A3E) shall be used. The carrier must not be modulated beyond 100%

The transmitter shall be capable of 100% modulation depth with a 1kHz sidetone for 50% duty cycle, and of 50%



Toroidal transformer to feed mast lights. Plus discharge balls!

output power and the Antenna System gain shall not exceed the value specified in the contract.

#### **Connection to the Public Telecommunications Circuits.**

Where the studio and transmitting equipment is connected together by circuits provided by Public Telecommunications Operators (eg British Telecom or Mercury), the equipment must comply with the requirements of British Standards BS6328 Part 6, Sections 1 and 2.

#### **Control**

Any controls which-if maladjusted, might result in any of the requirements being transgressed, shall not be accessible without the use of a tool.

#### **Environmental Conditions**

The performance shall be maintained over the following range:

Ambient Temperature: 5 to 35 °C  
Relative Humidity: 0 to 95%

#### **Power Supply**

The performance shall be maintained with variations of supply voltage within the range +6% to -10% of the nominal value.

#### **Documentation**

Operating instructions for the correct use of the transmitter must be kept at all times. Any modifications to the

transmitter must be carried out by qualified personnel, and details reported to the Radio Authority.

### **Sound Performance Requirements**

#### **Audio Frequency Response**

For a good quality broadcast service, the audio frequency response of the transmitter, measured through a high quality demodulator, shall not vary more than  $\pm 1\text{dB}$  over a range 40Hz to 5kHz.

#### **Audio Distortion**

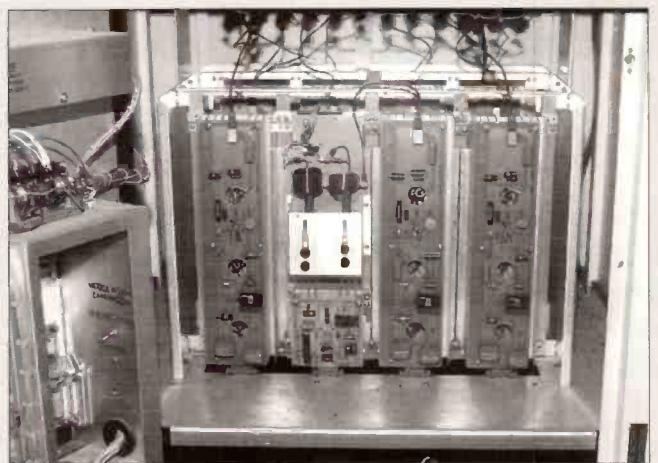
With a single modulating frequency in the range 40Hz to 5kHz, and with the modulation depth set to 75%, the total r.m.s. distortion shall not exceed 2%.

#### **Audio Noise**

The audio signal to noise ratio, measured using a peak programme meter and weighting network as defined in CCIR Recommendation 468 shall exceed 50dB, relative to 100% modulation at 1kHz.

#### **Transmitter Protection**

The transmitter shall be designed such that it will not suffer damage when operated continuously with the r.f. output connector either open or short-circuited. Precautions shall be taken to minimise the possibility of damage due to lightning or static discharges, resulting from the use of an m.f. antenna which is



Inside the 'works' of the transmitter

### **Specification of MW-1A Solid State AM Broadcast Transmitter.**

**Power Input:** 210 - 260V a.c. 50 or 60Hz

**Power Consumption:** 2.0kW at 1kW Carrier, no modulation.

3.0kW at 1kW Carrier and 100% modulation

10dBm 600Ω (Balanced)

$\pm 1\text{dB}$  from 20Hz to 10kHz

1.5% or less at 1kW, 20Hz to 10kHz, 95% modulation

Rated to 100W

Meets or exceeds FCC and CCIR requirements

535 - 1620kHz

50Ω unbalanced

Meets or exceeds FCC or CCIR requirements

Less than 2% at 100% modulation with 400Hz tone

2% or less 4/1 or 1/1, 60/2000Hz or 60/700Hz at 95% modulation

10V r.f. (r.m.s.) modulated output sample at 50Ω

Self-contained interface for all standard systems

Progressive Series Modulation (p.s.m.) Patent Pending

Power amplifier typically 80-85%.

Overall transmitter is 50% efficient at 1.1kW.

normally insulated from earth.

#### **Transmitter Antenna Impedance Match**

The transmitter must be capable of meeting the specification when working into an aerial return loss of 20dB carrier, falling to 10dB at  $\pm 6\text{kHz}$  from carrier, which is a

**m e l l o w**  
**1557**   
**Medium Wave Radio**

characteristic that should be readily achievable for an m.f. antenna.

# World Weather Reports from Broadcast Stations and Others

*Although the study of meteorology is in itself a fascinating hobby, combining this with DXing is even more informative for the weather buffs. The sources of global weather patterns at any one time are many and vary from the simple everyday television weather maps to the complex Admiralty facsimile charts of maritime conditions. Philip C. Mitchell explains.*

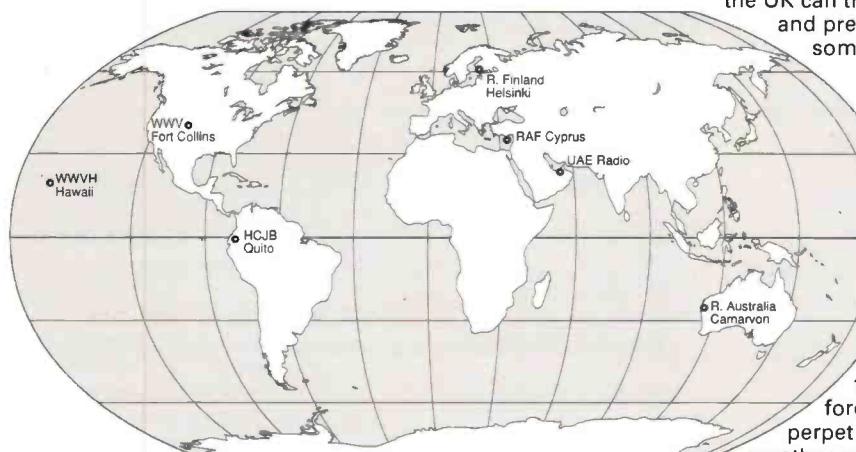
the start or finish of English transmissions, but some transmissions from other broadcast stations are extremely low power and are, therefore, excellent tests as to the efficiency of receiver equipment and the skill of the DXer.

## Geography Lesson

Radio Australia in their Pacific broadcasts on 21.755MHz conclude at approximately 0845 each day with extensive weather coverage of the Pacific Ocean areas including North Cook Island (Tonga), South Cook Island (Rarotonga), Gilbert Islands and Tuvalu (Funafuti), Fiji Islands (Viti Levu), etc., also Coral and Bismarck Sea areas. A veritable geography lesson in itself and if time permits, weather states and forecasts for principal Australian towns from tropical Darwin in the

found from stations WMV and WWVH. These are primarily standard time signal stations operated by the National Institute of Standards and Technology located at Fort Collins, Colorado, USA and Honolulu, Hawaii respectively, but relay weather sea conditions, warnings and direction of developing storms in the Atlantic (WWV) and Pacific (WWVH). The frequencies, shared by other world-wide standard time signal stations, are 2.500MHz (2.5kW) 5.000, 10.000 and 15.000MHz (10kW), 20.000MHz (2.5kW) and the weather states from WWV are broadcast between 8 and 11 minutes past each hour and from WWVH, the weaker signal in the UK, between 48 and 51 minutes past each hour. Those developing Atlantic storms that may effect the UK can thus be identified and predicted with some accuracy.

Ecuador, South America, with the equator bisecting the northern part of the country, has great weather contrasts between the northern part of the country, the tropical rain forest and Andean perpetual snow. This weather pattern can be gathered from HCJB, which itself is 2850m above sea level.



**W**eather states and forecasts from official radio sources for professional users i.e. aircrew, mariners, etc., has already been covered in the *SWM Weather Watching* supplement given away free with the April 1991 issue. This article, however, will cover weather information derived from broadcast bands although reference will be made of some other official sources not mentioned so far. Most broadcast stations regularly include weather reports in their schedules, but not all English language schedules do just that. Patience is needed to record the exact timings of weather reports, which usually occur at

north to the more temperate region of Tasmania in the south of the continent. Otherwise, the mainland reports are given at 1130UTC on the same frequency. An excellent overview of Australia's varied climate can thus be obtained from these broadcasts.

Moving eastwards, Honolulu, Hawaii broadcasts aviation weather on 8.828MHz (s.s.b.) covering extensive eastern United States and eastern Canada from Los Angeles, San Francisco, Las Vegas in the States to Vancouver and Ontario in the cooler regions of Canada. A more esoteric source of weather information can be

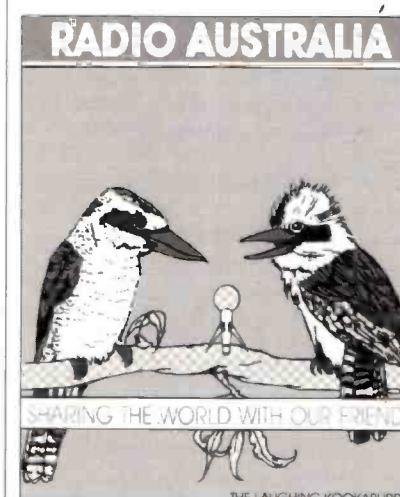


Its extensive English broadcasts usually include daily weather reports, but vary in their timing. The European HCJB schedule runs from 0700 to approximately 0900 each day and is transmitted on 11.730, 15.270 and 17.895MHz on s.s.b.

## Complete Contrast

Moving to mainland Europe, most principal areas have been covered by VOLMET broadcasts referred to in *Weather Watching*, but most broadcast band stations during their English broadcasts include at beginning or end of news bulletins a local forecast. Almost in the Arctic Circle, Helsinki, Finland 17.799MHz conclude their English broadcast with local weather at approximately 0839 and also on 15.240MHz at 0938. As a complete contrast in climatic terms, United Arab Emirates Radio 15.435, and 21.605MHz broadcast a general report of Gulf weather and sea states at approximately 1035 and 1335 UTC at the end of their English news broadcast. For those readers about to holiday in the Mediterranean area, RAF Cyprus broadcast weather from selected stations in that region on the 'Architect' network - 18.018MHz s.s.b. only - at about 0715 UTC daily and occasionally at 15 minutes past the hour for Akrotiri and Larnaca, Cyprus.

For the short wave listener who has an interest in weather and climatic patterns, there is much useful information to be obtained world-wide on the broadcast bands. Add to this source the VOLMETS previously mentioned, weather map reception via satellite, FAX and RTTY modes, then the global meteorological picture becomes very much more comprehensive.



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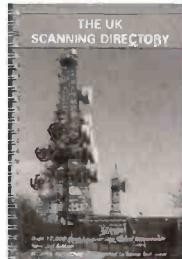
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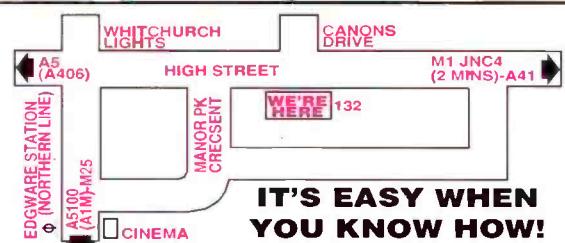
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# Trident TR-2400 Scanner



Nevada Communications have recently introduced three new scanners under the Trident label. Kevin Nice looks at the top of the range TR-2400 and listens to a mixture of frequencies.

**N**ot having previously used any scanners in anger, I agreed to preview this receiver from a novice users perspective, a view point which I am sure is that of many prospective owners. If you fall into this category and are not sure whether to invest in a scanning receiver then perhaps this article will help you make that decision.

The Trident TR-2400 offers wide coverage from long wave through to the top end of the u.h.f. band. The exact coverage is shown in the Specification table. The TR-2400 is a hand-held unit with the now familiar format for controls and display, that is power switch/volume control, combined squelch threshold and b.f.o. frequency, rotary channel control, buttons for attenuator, display backlight, and b.f.o. finally sockets for antenna (BNC) and ear piece. The front panel features the clear easy to read liquid crystal display the speaker and the main user interface - keyboard. The right hand side sports a socket for the charger, and lastly the rear of the receiver is fitted with a substantial pocket clip.

So I set off equipped with the

User Manual, the UK Scanning Directory and VHF/UHF Scanning guide, both available from SWM Book Service and, of course, the radio.

## Modes of Operation

First on my agenda was to receive some signals. At first the receiver seems a little daunting but this soon wears off as you get to grips with the way things work, it is after all very intuitive. There are three ways to use the Trident scanner, Manual Mode, Scan Mode and Search. Before I detail the modes of operation it is important to understand the way in which a scanner is organised as this may not be entirely obvious to the newcomer - after all, it wasn't to me!

## Memories

The heart of any scanner is the memory, allowing the storage of frequencies of interest. But there's more. In addition to the frequency you can also store the mode of operation, i.e. a.m., n.b.f.m., and w.b.f.m. The TR-2400 has 1000 of memories such as these. They are organised into 10 banks of 100. Its these memories (channels) that are used when the receiver is used in **scan mode**. There are also 10 range memories these are used by the receiver in **search mode**. Range memories are programmable with the following information, lower frequency, upper frequency, step size, and mode.

In **manual mode** the memories are not used and the receiver behaves similar to a conventional receiver with continuously variable coverage, the operating frequency can be entered directly from the keypad, or if the manual button is depressed whilst listening to either a search or scan channel then that frequency remains selected.

Both mode and step size can be set and reset any number of times during manual mode the lower limit for step size can be set to 1kHz, which is essential for resolving s.s.b. signals, the upper limit is 999kHz not that I can think of an application for a step size this high. The frequency can be incremented or decremented by using either the rotary control on the top of the receiver or the up and

## Specification

<b>Frequency Coverage:</b>	100kHz - 2.060GHz		
<b>Modes:</b>	s.s.b., c.w., a.m., n.b.f.m., w.b.f.m.		
<b>Frequency Stability:</b>	±5p.p.m. -10°C to +50°C		
<b>Receiver Circuitry:</b>	Triple Superhetrodyne		
<b>Frequency Increment:</b>	1-999kHz, and multiple of 1kHz or 12.5kHz (under 100kHz)		
<b>Memory Channels:</b>	1000 (100ch x 10 banks)		
<b>Search Banks:</b>	10 programmable by user		
<b>Frequency Lockout:</b>	10 programmable by user		
<b>Priority Channel:</b>	50 per search bank, 1000 total		
<b>Priority Sampling:</b>	50 per scan bank, 1000 total		
<b>Receiver Sensitivity:</b>	1, programmable by user Every 2 seconds		
	n.b.f.m.            a.m.            w.b.f.m.		
1-5MHz	12dB SINAD	10dB S/N	40dB S/N
5-1000MHz	3dB <sub>p</sub> e.m.f.	0dB <sub>p</sub> e.m.f.	37dB <sub>p</sub> e.m.f. or better
1000-1500MHz	0dB <sub>p</sub> e.m.f.	3dB <sub>p</sub> e.m.f.	37dB <sub>p</sub> e.m.f. or better
1500-2000MHz	3dB <sub>p</sub> e.m.f.	6dB <sub>p</sub> e.m.f.	37dB <sub>p</sub> e.m.f. or better
<b>Antenna Connection:</b>	50 Ω unbalanced, BNC		
<b>Audio Output:</b>	More than 120mW into 8Ω load, 10% t.h.d.		
<b>Power Source:</b>	4.8Vdc, NiCad batteries 12V d.c. external 100V a.c., 120V a.c., 220V a.c. (with a.c./d.c. adapter)		
<b>Memory Backup:</b>	Non-volatile memory		
<b>Dimensions:</b>	78 x 41 x 184mm (W x D x H)		
<b>Weight:</b>	410g		

# Trident TR-2400 Scanner

down buttons on the key-pad.

It is very easy to enter frequencies into both scan and search memories and the method used is very intuitive.

## Virtual receivers

The receiver performs exceptionally well. I was most pleased with the way in which, effectively, bands of frequencies can be stored in the search banks, thus creating a set of virtual receivers that can be selected at will. I used the set to monitor Airband, 144 and 430MHz amateur, v.h.f. marine and various other bands. By using the **Link** capabilities of the scanner it was possible to include or exclude the banks and therefore concentrate on the specific areas of interest at any given time.

I noticed several birdies, as is

to be expected with a receiver that is controlled by a microprocessor driven synthesiser. By using the **lockout** function this annoyance was removed.

The receiver's ability to either continue scanning or remain monitoring a given channel that had been occupied is extremely and useful this facility is selected by using the **hold/delay** toggle.

Should you wish to maintain a close watch on a specific frequency the **priority** function is very useful. Assigning any one of 900 memories as the priority channel (bank zero cannot be selected) will instruct the receiver to check this channel every 2 seconds if it is found to be active the receiver will cease activity and switch to the priority channel until it clears or until the user instructs it to do something else.

## Competent

Overall I found the TR2400 a very pleasing receiver to operate. It is a very competent receiver indeed many services and bands have been monitored. I was surprised by the performance offered by the supplied rubber duck antenna, which gave an acceptable signal to noise ratio on most frequencies. I also used a table-top discone type antenna and this gave improved results over the rubber duck, as you would expect.

Ease of use could not have been better. I do have one minor niggle, however. The case is not up to the job, the stitching was



coming undone after a couple of days of use and it is very awkward to remove with the pocket clip fitted. Mind you, not that it impairs the receiver performance one little bit. Thanks go to **Nevada Communications, 189 London Road, North End, Portsmouth PO2 9AE**. Tel: (0705) 662145 for the loan of the receiver which costs £369.00.

## Review

*The Assistant Editor takes a look at this extremely portable frequency counter.*

If you don't want to use up too much precious shack space, but you do want to measure frequency in the range 1MHz to 2.4GHz, then here is the solution - an easy-to-use, portable counter from Quantek. It's so compact, in fact, that it is smaller than the combined power supply and charger supplied with the counter.

The unit is very easy to use as there are, after all, only three controls featured on the front panel. These are a power switch, hold switch, and gate fast/slow switch. Also located on the front panel is the eight-digit, seven-segment l.e.d. display as well as a calibration

trimmer. The 50Ω input to the counter is by way of a BNC socket, with a retractable antenna being supplied for strong local signal pick-up.

The unit is housed in a black anodised case and is powered by internal NiCads. The counter may be operated whilst power is being supplied by the combined charger and power supply. The charging time for the internal power source is approximately 14 hours and don't forget to cycle the battery periodically to maintain full capacity.

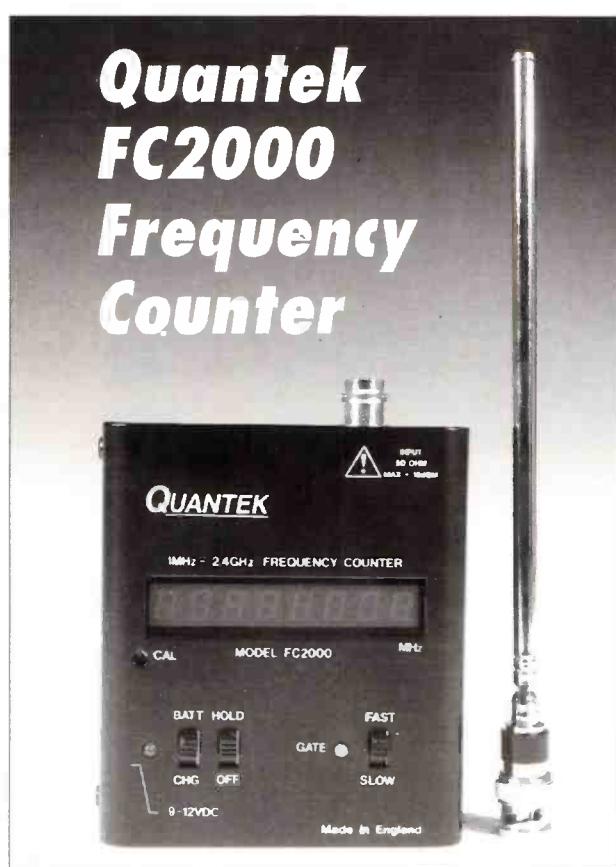
Operation of the robustly designed unit is very straightforward. One

## Specifications

**Frequency Range:** 1MHz to 2.4GHz  
**Sensitivity (typical):**

800µV @ 10MHz  
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640µV @ 450MHz  
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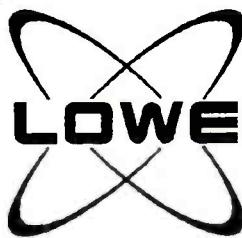
+15dBm, 1.26V r.m.s.  
±1p.p.m 25-35 °C  
1p.p.m. per year typical  
±1 count l.s.d.  
Fast 0.25s resolution 1kHz  
Slow 2.5s resolution 100kHz  
Internal Ni-Cads. 4 x AA, 700mAh  
mains adapter/charger, 240V a.c.  
input, 12V d.c. output, centre pin  
positive.  
Size: 100 x 87 x 28mm



simply switches on the unit, selects the appropriate gating speed (FAST 0.25s or SLOW, 2.5s, for improved accuracy), connects either the antenna supplied or a suitable cable to the source to be measured and then reads the frequency on the display. The display can be frozen if desired and the measured frequency

retained by the use of the hold feature.

This useful and compact portable frequency counter can be obtained for £119.00 + £5 p&p from: **Quantek Electronics, 1678 Bristol Road South, Birmingham B45 9TZ** Our thanks are extended to the for the loan of the review unit.



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**WIN 108**  
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### JRC NRD535 -

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In the course of a day I get asked many questions about shortwave receivers but the most common is "Should I spend more money - what will I get if I do ?" I've always believed that the more you pay, the more you should get and in receivers, this doesn't strictly mean you'll hear more stations - a popular misconception! Spending more money will normally get you a receiver designed and manufactured to a much higher standard. In the case of the NRD535, this starts with the fact that it is made by the Japan Radio Company. They've been in business far longer than some of the other household names and as most of their other products (HF transceivers, radars, marine electronics) are used professionally, you can be assured of the pedigree.

A more expensive receiver can normally be upgraded to suit the needs of listeners who may have very different needs. For example, the IF filters fitted are excellent giving good selectivity that will probably suit most people but optional SSB and CW filters can be fitted to tailor the receiver to your particular needs. The CW buff may fit the 500 or 300kHz filter and the datacoms purist may want the 1.8 or 1kHz SSB filter. Personally, I'd rather fit the CFL243W Bandwidth Control Unit as it gives me a continuously variable IF bandwidth right down to 500kHz - superb for the wide range of listening that I do, coping with weak SSB signals, both data and voice, suffering badly from strong stations on adjacent channels.

In its basic form, it is an excellent receiver which will more than please most listeners. However, if the type of listening you do changes or perhaps if you become more experienced, the fact that you can upgrade without having to trade in will protect your investment. To help protect your investment, we are now offering a full two-year warranty on JRC receivers purchased from ourselves.

**NRD535.....£1549.00**

PS We are aware of a quantity of these in circulation with incorrect mains transformers for the UK market, and with Japanese manuals.



# Restoring A

**Michael York  
G1BKI set about  
restoring an  
Admiralty Pattern  
W1516B, Tuner  
Amplifier B21B  
back to working  
order.**

**Fig.1: Circuit diagram of power supply showing the short circuit between 0V and -40V rails.**

The receiver was in a very poor condition with large scratches on its black metal case and solder splatter all over the front metal cover. The accompanying power supply was housed in a grey painted, wooden box inhabited by a large spider and woodworm. Wires of multiple colours and a combination of electrolyte from the leaking reservoir capacitor protruded from the back in an electrically unsafe manner. Further examination and the poor quality of construction convinced me that the power supply was not the original one for the receiver and needed replacing.

## External Connections

The receiver is quite large, measuring 570 (w) x 360 (h) x 410mm (d) with two small metal boxes, attached to the left hand side, carrying twelve antenna sockets. The right hand side of the cabinet are six terminal marked HT 200V, +, -, AC 230V and PHONES - no provision for a loudspeaker or an accompanying



**The B21B's front panel in all its glory.**

transmitter. This at the time seemed unusual, as my previous restoration projects all had additional transmitter connections for muting purposes.

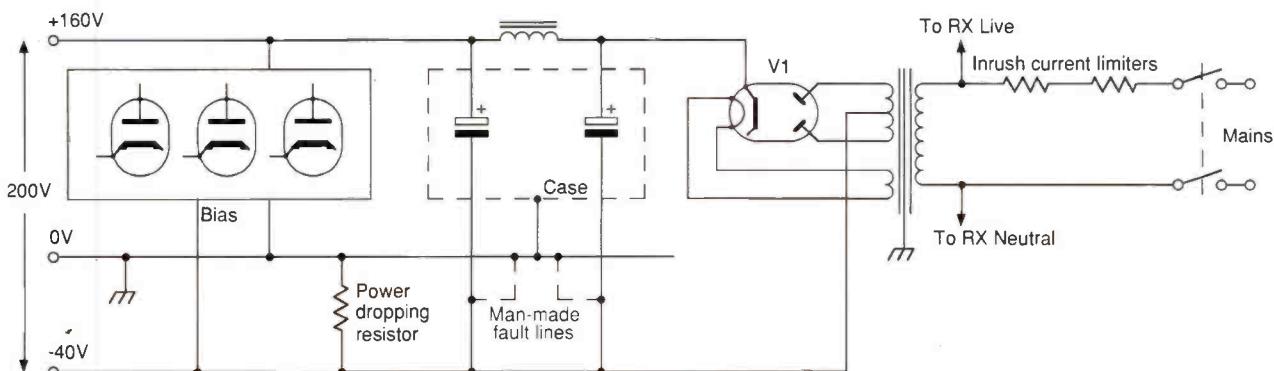
## Front Panel Removal

The solder-splattered front panel was for transmit purposes and designed to protect the relevant control knobs. On the reverse side, to my amazement, was a full circuit diagram partially destroyed by rust stains from the badly flaking

panel. Taking off the panel by removing two wood screws and a rusty nail, I found to my delight a complement of controls and identification plates with markings Admiralty Pattern W1516B, Tuner Amplifier B21B and the year of manufacture, 1944. No manufacturer's name was marked, but this was common with many Admiralty Receivers.

## Controls

All the controls I expected



# B21B

**Table 1.**

Valve	Function	Type	Anode current (mA)	US equiv.
V1	1st r.f. stage	NR64	6 - 7	6K7G
V2	2nd r.f. stage	NR64	3 - 4	6K7G
V3	Frequency changer	NR82	0.5 - 1	6K8G
V4	1st i.f.	NR86	3 - 4	6K7G
V5	2nd i.f.	NR82	2	6K8G
V6	3rd i.f.	NR86	3 - 4	6K7G
V7	2nd Detector & 1st a.f. stage	NR68	0.5 - 1	6Q7G
V8	2nd a.f. stage	NR85	12	6F6G
V9	Carrier insertion oscillator	NR86	4 - 5	6K7G

to find were there, neatly marked with screw-fitted identification plates and perfectly readable. Centre left was a large T-handle that resembled a demolition detonator plunger. This selected one of the four bands: I. 1 - 2MHz, II. 2 - 4.5MHz, III. 4.5 - 10MHz and IV. 10 - 20MHz with overlapping band edges. Directly below this was a large black tuning knob with a small central tuning adjustment. To the right hand side, directly below the Bakelite panel meter, was a red knob that selected the meter to read h.t. volts, audio level and the current of the selected valve. A logging chart for all the valves was attached centrally to the receiver and had the valve currents written down in pencil.

The carrier frequency insertion oscillator can be switched into circuit by a BT (GPO) style toggle switch, but no c.f.i. fine tuning control as would be expected on modern receivers. The left bottom corner was an elongated tin plated metal knob with a white backing plate lettered SEARCH, D/F, FORWARD & REVERSE SENSE. The switch led me to believe I had discovered something special and what all the antenna sockets did became

apparent. The receiver was obviously used for direction finding and was never intended to be used with a transmitter.

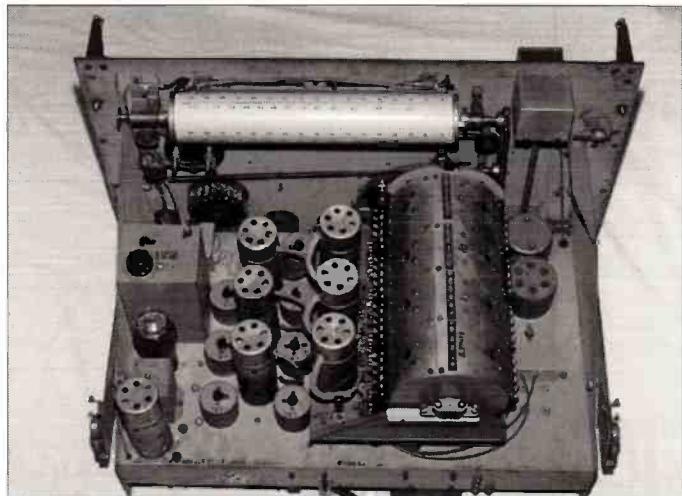
### Stumbling Block

There appeared to be no a.f. volume control, but the last remaining control was marked GAIN. This particular control puzzled me as it was numbered 1 to 10 anticlockwise. From where it was situated near the two headphone sockets, it was assumed to be some form of a.f. gain.

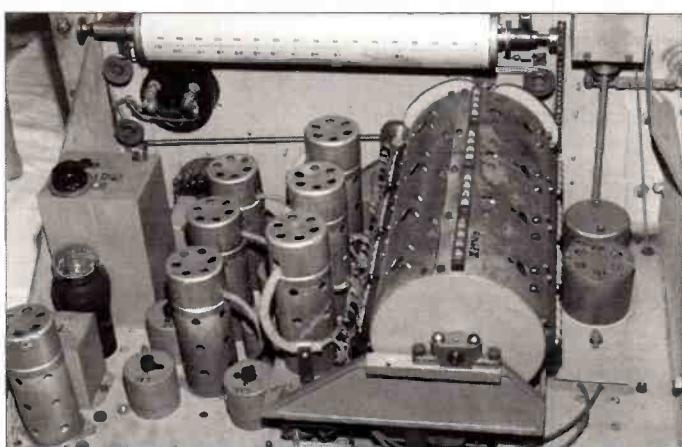
### Detective Work

Four thumb screws should have released the control panel to allow access to the inside, but this was not so as the panel was jammed solid and to avoid damaging the receiver, forced entry was abandoned. After hearing from work colleagues of anti-personnel devices being fitted to some government equipment I decided on the cautious approach.

At this stage, the receiver was left alone until further information was sought from the previous owner. Unfortunately, although he was extremely co-operative, the only information he



The B21B's chassis removed from its base.



Close-up view of the band selection drum, operated by the large T-handle on the front panel.

could give me was about the alterations carried out in 1953, when the receiver was modified to include a loudspeaker matching transformer and 'Speaker Off' switch. This was confirmed by the additional components drawn in pencil on the original circuit diagram and dated 1953. To try to obtain more information I wrote and made several phone calls to HMS *Mercury* and the Naval Historical Branch with no result - until some weeks later a brown A4 size envelope arrived on the doorstep. To my delight it contained an *Operating Manual* and book of instructions.

## Birth Certificate

According to the *Operating Manual* the B21 is a Marconi RG42 commercial superheterodyne receiver, designed in 1940 and adapted as a high frequency D/F receiver. The information sent was so detailed that it resembled a birth certificate. To my relief no anti-personnel device was fitted and if I had removed an inspection plate earlier I would have found four additional screws to release the control panel.

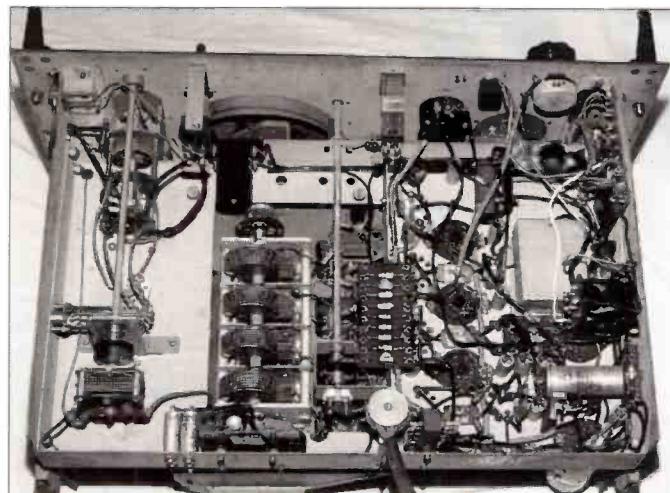
## Valve Line Up

The control panel effortlessly slid out of the cabinet and revealed a full compliment of original valves as shown in **Table 1**.

The receiver was complete in every detail, even the tuning scale pilot lamp part numbers matched the parts list in the manual. The modification for loudspeaker was neatly done and there was no sign of any soldering or modern parts having been fitted. The receiver had, apparently, not been opened since 1953.

## Restoration

With the operating manual and other information I decided to attempt to restore the receiver to working order. The receiver

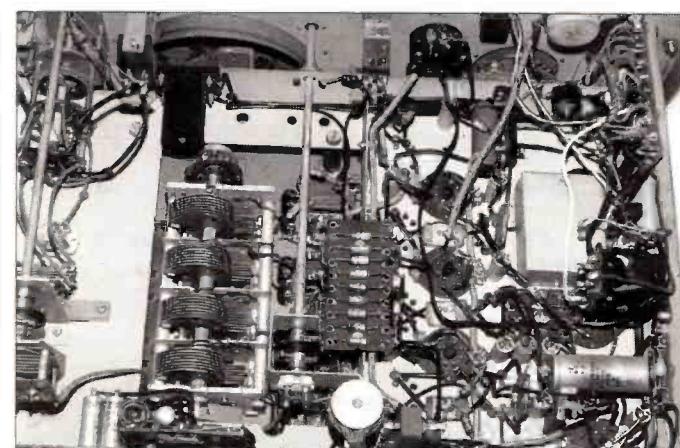


**Two views of the underside of the B21B's chassis. The construction is typical of sets of this period.**

required 230V a.c. and a high tension voltage of 200V d.c. to operate correctly, as I had only the woodworm ridden power supply available, I had no other choice but to repair the unit first. The case was removed and promptly stored in the dustbin.

Inside the power supply was an Octal base rectifier and a 32+32μF reservoir and smoothing capacitor which had leaked all over the interconnecting wires. The wiring was removed and electrolyte washed away with soapy water. When dry, the power supply was rewired with pvc insulated wire and a replacement capacitor was found in my junk box. However, its date code indicated that it was 20 years old and although it had never been soldered, it would need reforming before it could be safely used. The reforming process was performed on a variable 0 to 40V d.c. supply and the voltage gradually increased over a 60 minute period whilst monitoring the series current on a digital multimeter. When the current remained steady at below 5μA it was assumed to be reformed. It was then simply soldered into the circuit.

For safety reasons extra earth connections were added to all metal parts and all existing earth points were checked to make sure that there was no paint under screw heads. Star washers were then fitted to



ensure earth continuity. Mains voltage creepage distances were checked by measuring between all live connections and associated components and was found to be over 3mm, as required by today's standards. The mains input to the power supply was switched and then fed back out to the receiver 230V a.c. connection.

At this stage, as all the valves to the receiver were original, I decided to try to prolong the valve life by limiting the initial switch-on current by a minor modification. Electromail stock a range of inrush current limiters (Stock Nos: 210-667 to 210-757) that function in a similar manner to a thermistor, but are manufactured from modern metal oxide materials. These devices limit the inrush current by their resistance when cold. When warmed by the current flowing through them they have a low resistance, thus letting full current flow.

## Switch On

With the minor modifications complete it was time to switch on and being cautious I loaded the power supply with a large wire-wound resistor instead of the receiver. After the initial rectifier warm-up period the h.t. rose to 265V d.c. as I was uncertain of the power supply capability I assumed it to be correct under resistor load conditions.

After switching off and allowing for the rectifier to cool, it was time to connect to the receiver and again power-up with the digital meter in series with the h.t. supply.

On initial switch-on the valves glowed dimly for a fraction of a second, proving that the inrush limiters were working correctly, so I monitored the h.t. current until it exceeded 100mA.

Immediately the power supply was switched off

and all interconnecting wires checked. At this stage I realised there was no antenna or speaker connected. How I expected the receiver to work without these I don't know! The speaker and antenna were connected and the power-up procedure was repeated. This time the current drawn was approximately 50mA - within the total valve current as written on the logging chart on the front of the receiver, but there was still no audible noise from the loudspeaker.

At this stage I temporarily disconnected the antenna and speaker to see if the current drawn changed. Puzzled by this I operated the speaker switch and watched in amazement as smoke appeared from the switch. The switch itself was in series with the h.t. side of the matching transformer and was leaking to earth. It was easily replaced with a double pole switch with both poles connected in series for additional safety. This time the receiver burst into life at full volume on power-up and a foreign station was heard.

## Simple Mistake

The gain control on the front of the receiver, according to the manual, should have varied the a.f. output by changing the negative voltage on the valves, but made no difference. Checking all the relevant voltages showed that there was no negative supply rail and following the supply rail back to the input stage I realised the fault had been made by myself.

By replacing the

smoothing capacitor with a non-insulated case type I had inadvertently grounded the negative h.t. to chassis, which shorted out the negative rail and removed the bias voltage, as shown in **Fig. 3**. The capacitor was desoldered, fitted with a heat shrink sleeve and promptly soldered back into circuit.

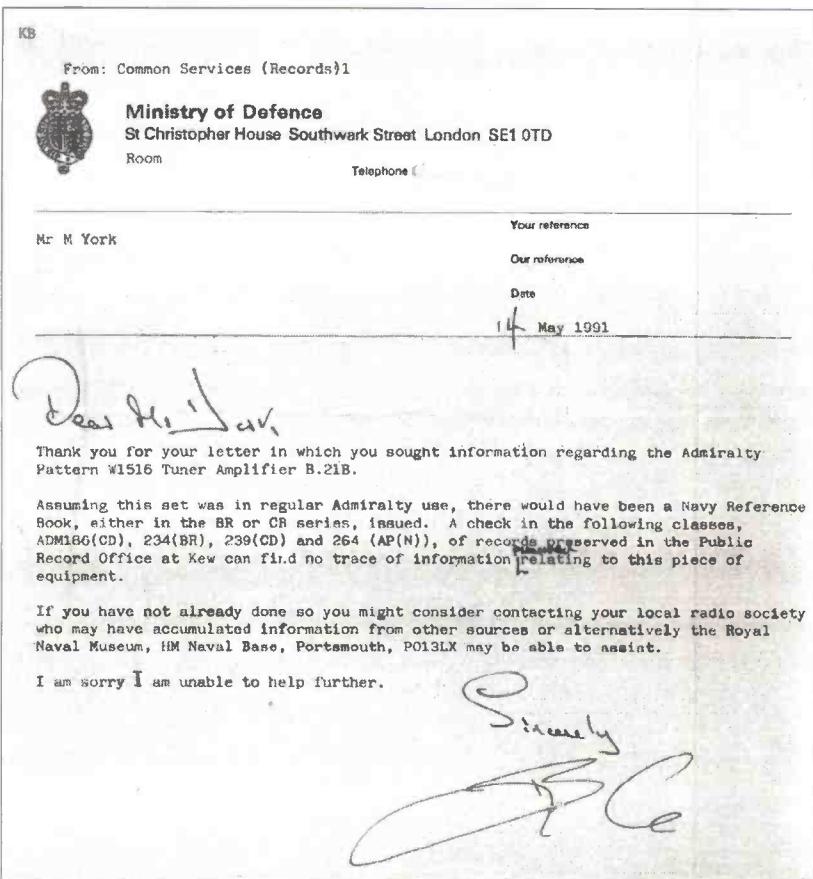
## Final Test

The receiver was now ready to be powered up and all the interconnecting wires and terminals were insulated, because at this stage I had an audience of the whole family.

I switched on and everything burst into life - with controllable audio level. All the wavebands functioned correctly and the ability of the receiver to pick up distant stations showed that I had a very sensitive receiver. The panel meter showed exactly the valve currents as written down on the log and lightly tapping each valve showed no signs of flash over or microphony.

## Conclusion

The receiver was in excellent condition internally and not as bad as I first thought. The faults on the receiver were mainly the modifications done in



1953 and the ones I put on myself. Restoring and modifying the B21B receiver has been very rewarding and has taught me a great deal about vintage receivers. It is always pleasant to rescue any well made equipment from possible scrap. The receiver is used regularly and since owning it, the only component failures in twelve months have been pilot lamps.

I would like to thank  
HMS Mercury for  
supplying the  
Operating Manual and  
helping to identify the  
B21B receiver.

## Abbreviations

a.c.	alternating current
a.f.	audio frequency
BT	British Telecom
c.f.i.	carrier frequency insertion
c.i.o.	carrier insertion oscillator
d.c.	direct current
D/F	direction finding

GPO	General Post Office
h.t.	high tension
i.f.	intermediate frequency
mA	milliamperes
MHz	megahertz
mm	millimetres
V	volts
$\mu$ A	microamperes
$\mu$ F	microfarads

0702  
206835

# Waters & Stanton

## NRD-535 Short Wave Receiver £1549 Carriage £6 Great Value



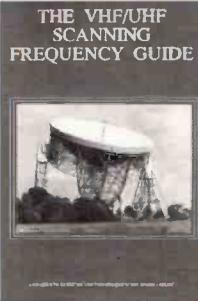
This receiver offers exceptional performance and is probably the ultimate sub-£2000 receiver. We like it a lot and have no hesitation in recommending it to the serious enthusiast. Features 100kHz - 30MHz, 200 memories, superb dynamic range, Variable Bandwidth 2.4 kHz - 500Hz, Notch Filter, RS-232 option, 1Hz step tuning, IF tuning, Noise Blanker, SSB CW AM FM, Squelch control, built-in 230V AC supply. Send for colour brochure.

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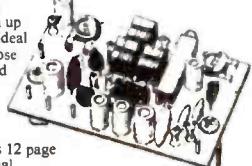
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# 21st Birthday 1973 - 1994

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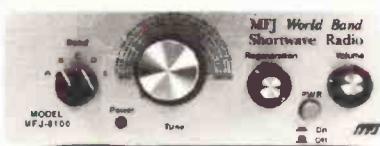
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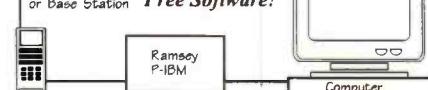


On demonstration. Call in and hear it on a decent aerial. Let us give you a good PX on your old receiver or a cash deal. Phone today.

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*Hand-held or Base Station Free Software!*



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- 30 - 1200MHz Black Finish
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Just the job for scanner owners. Gives superb reception and fits the modern car in seconds.



# Learning a Language by Short Wave Listening

You've heard all the arguments, I'm sure. All the advantages of being able to speak another language. Have you perhaps been unwilling, or maybe unable, to join an evening class? Not to worry, Richard Howard offers you some useful advice!

**D**id you realise that as short wave listener you have every opportunity to bring the classroom into your shack? Learning language by radio is certainly nothing new. BBC *English by Radio* is proof of this. Other broadcasters are engaged in similar ventures. While listening on the short waves you, too, must have heard the German language courses aired by Deutsche Welle. The Spanish lessons broadcast from Madrid. The Chinese from Beijing. My *Czech out Czech* transmitted by Radio Prague. But have you ever considered making up your own course? Beginners, intermediate or advanced students can all get assistance in their attempts to learn foreign languages with a little imagination and a fair helping of patience. I used short wave radio to learn Czech, to gain confidence in French and I'm using it now to keep up my Chinese.

Just pause a minute to consider what you hear during a thirty-minute transmission in English on the broadcast bands. Call-sign, identification, programme reviews, news, commentaries, features, schedule and sign-off. The uniformity is not peculiar to English-language programming. It is repeated in just about every language conceivable. And this can be exploited to the full to make up your own language course.

## Intonation Patterns

You'll need a textbook on grammar of some sort and sooner or later you'll also need a dictionary. Before you've read through the inevitable introductory notes on

pronunciation you should begin your listening. Even listening to programmes you can't understand is generally considered beneficial. You start to notice the intonation patterns of the new language, the way the voice rises and falls in individual sentences. It won't be long before you begin to pick out individual words and phrases that you've met in your textbook. For learners at all levels your radio can be constantly at your beck and call, giving you as much practice as you can take! The advanced student of Russian, French, Spanish and Arabic could feasibly spend twenty-four hours a day at the receiver. Other languages demand more selective schedules. And the newcomer to any language would soon get tired of 'total immersion'.

## For Beginners

If you're a beginner or near-beginner this is what you should do. Study the table of contents and the index in your textbook very carefully. Find the list of numerals. You will need to be able to listen out for these. This can be your first project. Remember that the short wave spectrum is divided nicely into segments or metre-bands. Your most important numbers will be the 'names' of these, 11, 13, 16, 19, 21, 25, 31, 41, 49 and 75. Next, you'll need to make out the times of the transmissions. Usually beginning on the hour or the half-hour. Then add a couple of greetings - Good morning, good day, good afternoon, good evening, good-bye and good night. Once you have jotted these down you can put your ears to the test!

## Limitations

Of course, there are limitations to this method. Here in the UK it would be very unrealistic, for example, to expect to be able to learn the Pidgin English spoken in Papua New Guinea relying on short wave broadcasts. I have been disappointed in my attempts to hear anything in Afrikaans - apart from some rare programming from Radio Moscow. But for most, dare I say, major languages, it should be no problem to use your receiver as a teaching aid.

Complete listings of times and frequencies of virtually all broadcasts in all languages are to be found in the *World Radio and TV Handbook*. You should not restrict yourself to seeking transmissions from the country to where they actually speak your new language. Don't overlook the broadcasts targeted to the country from the international 'greats'. The BBC, Voice of America, Radio Moscow, Deutsche Welle, Radio Free Europe, Radio Liberty and Radio Vatican. All these broadcast in dozens of languages.

When I started to learn Czech I tuned to Deutschlandfunk, BBC, VOA, Radio Canada International and Radio Vatican. I was particularly glad to take advantage of the BBC's mini-English lessons with explanations in Czech and with short sentences to be translated by my Czech counterparts into English! I made full use of these for my listening comprehension exercises!

## Headway

After making some new headway in my studies using

the textbook I armed myself with a medium-sized dictionary. I had already started listening to news bulletins. At first I could not tell where one word ended and the next began. After a relatively short time, however, I recognised words meaning 'American', 'Soviet', 'British'. I searched in the dictionary for equivalents of 'United Nations', 'NATO', 'Security Council', 'Communist Party', 'international' and for the Czech names of some countries and their capitals. I would tune into the BBC or to the VOA in English to see what news was carried in their bulletins. Then I tuned to the Czech service hoping to hear the same items - often thwarted in my attempts to use the broadcasts from Washington because the bulletin was read in Slovak!

## Pop Music

Another source of material came in the features playing pop music. More often than not, the title of a British or American song would be translated into Czech and very often a brief summary of the text was given, also very conveniently translated.

While on the lookout for DX we s.w.l.s have set our ears some mean tasks. In comparison, learning a language via the ionosphere is child's play! I have learned some Chinese by the method I have outlined. And now, while conditions permit, I may even take up Indonesian, courtesy of the *Breakfast Show* type programmes audible on 11.695MHz after 2100UTC - all the way from Melbourne!



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to allow for exalted carriers reception. They're also fitting magnetically shielded coils and low-noise switching diodes in the bandpass filters which reduces residual noise in the receiver. The Europa model includes the KPAD1 frequency controller and the synchronous detector fitted as standard.

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Sony ICF-2001D portable short wave receiver with v.h.f. airband. This radio is as new and complete with box and manual. £199.00.

Icom IC-R72 communications receiver, 100kHz–30MHz, u.s.b./l.s.b./c.w./a.m./f.m. This receiver is as new. £599.00

AOR-900 v.h.f./u.h.f. hand-held scanning receiver. c/w box and manual. £149.00.

Sangean ATS-803A portable short wave receiver, two months old. £99.00.

AOR-3030 h.f. communications receiver. 100kHz to 30MHz all-mode receiver. This unit has got a slightly dented case, therefore, we are offering this unit with full 12 months warranty and all complete. £599.00.

Lowe Europa communications receiver. (This unit is a shop demonstrator and is as new and offered with a full 12 month warranty). £599.00.

AOR-2000 h.f./v.h.f./u.h.f. hand-held scanning receiver, (all complete with box and manual). £249.00.

Jin M-75 wideband receive (pre-map), (as new). £59.95.

Kenwood R-5000 communications receiver. 100kHz to 30MHz, all modes, u.s.b., l.s.b., c.w., a.m., f.m. (This is the top of the range and in superb condition, complete with box and manuals). £749.99.

Sony ICF-7600D portable short wave receiver (mint condition). £129.95.

PK-232MBX terminal unit. Decode, Packet, AMTOR, RTTY, c.w. and FAX. (Needs to be used in conjunction with a computer). £279.95.

Universal M-8000. The ultimate in all-mode convertors. Decodes: Packet, AMTOR, RTTY, c.w., FAX and Pagers. (This unit is complete and as new). £799.00.

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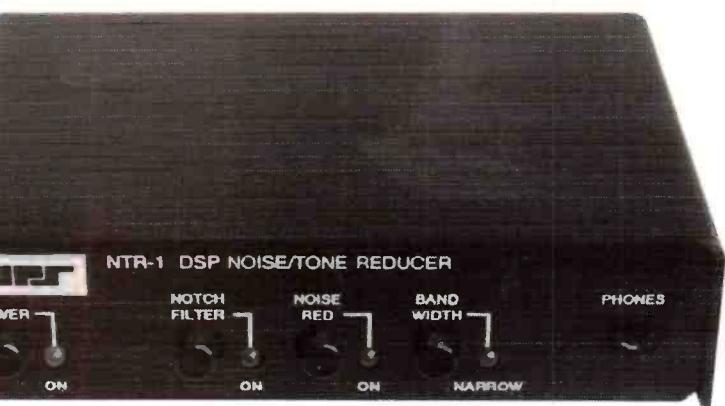
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# DIGITAL SIGNAL PROCESSING

*Mike Richards takes at look at the workings of the latest technology to hit the consumer market with a series of d.s.p. reviews and tutorials. This month he takes a look at the NTR-1 from JPS Communications*

Digital Signal Processing (d.s.p.) is certainly not new, but it is causing quite a stir at the moment. At the top end of the d.s.p. market is the impressive new HF 1000 receiver currently being imported by Lowe Electronics. But perhaps more significant is the range of accessories that use this technology. You may well have noticed the new noise reduction units being advertised in SWM and wondered what's so special about them. The common factor in all these units is the use of d.s.p. technology. This enables some remarkable performance achievements to be obtained with minimum effort from the operator. This latter point is



The NTR-1 front panel has minimal user controls.

where d.s.p. really scores, as the processor effectively frees the operator from having to make fiddly manual adjustments to the receiver.

To help give you an insight into the potential of d.s.p., I'll try and combine a technical description with a review of the NTR-1 noise and tone reduction unit from JPS Communications.

## The Conversion

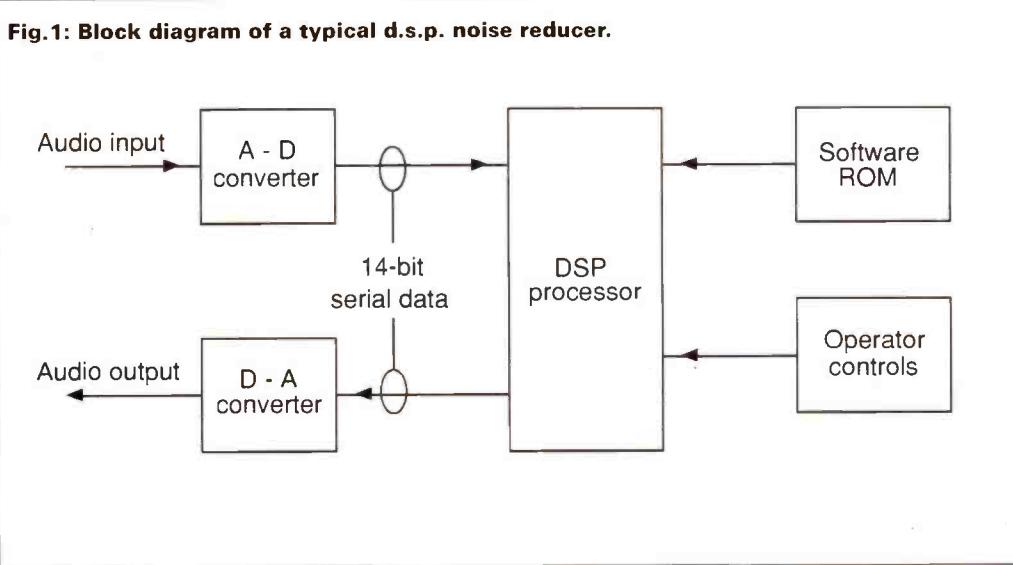
In order to link this new digital technology with our analogue world a

conversion stage is required. If we take the NTR-1 noise reduction unit as an example. This takes an audio input from the receiver and produces an audio output for connection to a speaker. In order to do this whilst using digital processing, the audio signal has to first be converted into a digital format and then back to analogue again.

Before I move on, I ought to explain what I mean by a digital signal. Quite simply, this is a series of numbers that represent the original analogue signal. Like most things in life, compromises have to be made and here it is with the accuracy with which the digital signal tracks its analogue partner. The key points are the digit length and the sample rate, but I'll cover these in more detail later.

The conversion is performed by a device that is logically called an analogue to digital converter or A-D converter. The reverse process is carried out by a digital to analogue or D-A converter. In many modern d.s.p. units these two functions are combined into one

Fig.1: Block diagram of a typical d.s.p. noise reducer.



integrated circuit that then becomes known as an Analogue Interface Converter (a.i.c.). Let's now take a closer look at just how this conversion system works.

## Sampling

At the heart of the conversion process is a technique called sampling. This is where the A-D converter freezes the incoming signal for an instant and takes a measurement of the voltage - much as you would with a voltmeter. It's this measured voltage that forms the digital equivalent of the analogue signal. This is fine, but you're probably wondering how an occasional voltage measurement can be used to digitally represent your favourite radio station. Well the secret's in the frequency of the voltage measurements. Obviously the more measurements that are taken, the more accurate will be the digital signal.

As you would expect, a lot of scientific work has been directed to finding the optimum sampling rate. The optimum being the lowest rate that will give a realistic representation of the original signal. However, the generally accepted rule is that the sampling rate must be at least twice the highest frequency of the signal you want to process.

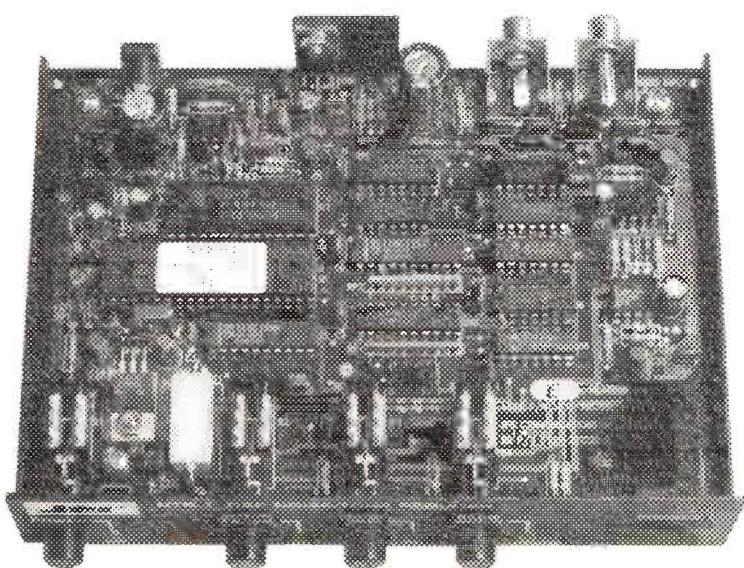
From this we can see that if we wanted to digitise a utility speech signal with a frequency range of 300 to

3400Hz, we would have to take measurements or sample the signal at a rate of  $3400 \times 2 = 6800\text{Hz}$  or once every  $147\mu\text{s}$ .

## Quantisation

With the sample rate sorted out we need to measure or quantify the incoming signal. This measurement process is generally called quantisation and the critical aspect is the accuracy of our voltage measurement. When dealing with a conventional digital voltmeter this is usually directly related to the number of displayed digits - the greater the number of digits, the higher the accuracy. The same is true of our analogue conversion process. The only difference is that binary numbers are used instead of the more familiar decimal system. The accuracy of the A-D or D-A conversion is still dependant on the number of digits, but in this case it's Binary digits, or bits. At the bottom end of the range are simple 8-bit converters but, more commonly, 14-bit converters are used for d.s.p. devices like the JPS NTR-1.

To illustrate the difference we need to think a little more about how the signal is



The inside of the NTR-1.

measured. When the A-D converter takes its sample of the signal, the result is given a value within its measurement range. In the case of an 8-bit converter this has to be one of the 256 available levels. However, the 14-bit unit has 16384 levels so it can provide a much more truthful representation of the original signal.

Once the signal has been successfully digitised it is passed to the main d.s.p. as a stream of serial data. This means that a single wire connection is used with each of the fourteen bits sent one after another. From all the information we've covered so far we can also work out the speed of this data stream. The bit rate becomes the sample rate of 6800Hz multiplied by the number of bits (14) = 95200 bits per second.

Once the stream of numbers representing our signal has been sent to the d.s.p. device it can perform all manner of mathematical manipulations to alter the original signal. When the d.s.p. has finished a serial data stream is sent back out to the a.i.c. for conversion back to an analogue signal.

A block diagram of a typical d.s.p. system is

shown in Fig. 1 and in the next session I'll delve a little deeper into the workings of the processor itself. I think that's enough technicalities for this session so let's now turn our attention to the more practical features of the JPS NTR-1.

## Noise Reduction with the NTR-1

As you can see from the photograph, the NTR-1 has a very simple layout with push-button selection of the appropriate mode. As the NTR-1 operates on the audio output of your receiver you simply plug it into the external speaker socket and connect a separate speaker to the NTR-1's output. If you prefer headphone operation, there is a standard 6.3mm jack on the front panel. In addition to automatic speaker cut-off this jack was wired to handle both mono and stereo headphones. There was no internal power unit so an external 11 to 16V d.c. at 800mA supply was required.

With such simple interconnections it's not surprising to find that there was virtually no setting-up required. All I did was set the receiver's volume control for a comfortable level. The only disadvantage with this



system was that there was no line output facility for the connection of a tape recorder or utility decoder. However, Lowe's are able to offer a simple modification to overcome this, if specified when ordering a unit from Lowe Electronics.

In use there are three basic facilities offered by the NTR-1 - Tone removal, noise reduction and bandwidth control. Each of these modes takes full advantage of d.s.p.

The notch filter for tone removal is unlike any other analogue systems as it completely automatically tracks and removes multiple tones within the passband. Not only is the depth of the notch excellent at around 50dB for 1 to 4 tones, but it responds in less than 5ms. The end result is completely trouble free removal of interfering tones. If, for example, a RTTY signal was to appear on a channel you were using, all you would notice is a few modest clicks in the speakers - the NTR-1 would automatically cut-out the RTTY tones.

The noise reduction mode was equally ingenious and used a technique known as dynamic peaking. With this system the d.s.p. analyses the incoming data for

## Specifications

<b>Audio Input:</b>	22Ω or 47kΩ impedance
<b>Audio Bandwidth:</b>	Wide 160Hz - 6.6kHz -6dB Narrow 90Hz - 3.4kHz -6dB
<b>Input Level:</b>	100mV to 2V r.m.s.
<b>Output Delay:</b>	<1ms
<b>Notch Response Time:</b>	<5ms
<b>Notch Rejection:</b>	>50dB for 1 to 4 tones
<b>Noise Reduction:</b>	Narrow 10 to 20dB Wide 6 to 12dB
<b>Audio Distortion:</b>	<0.5% for 0.5W at 1kHz
<b>Speaker Output:</b>	2W into 8Ω 10% distortion
<b>Input Power:</b>	11 - 16V d.c. at 800mA
<b>Dimensions:</b>	43 (h) x 166 (w) x 128mm (d)
<b>Weight:</b>	910g

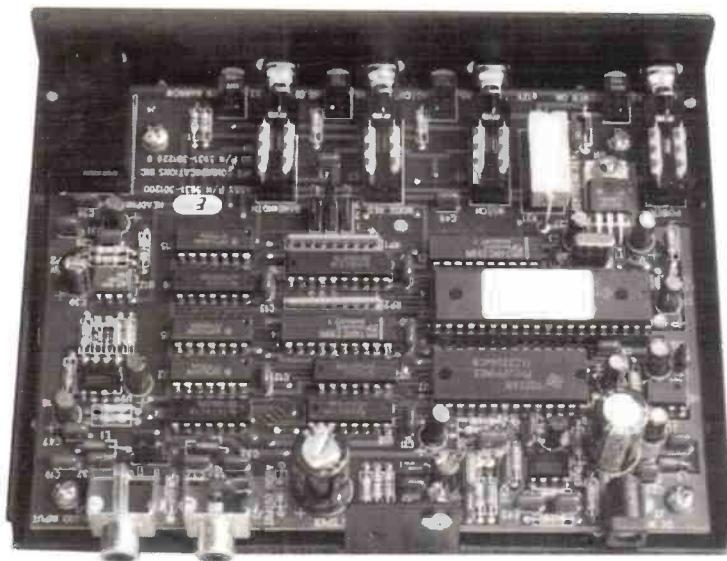
coherent signals such as speech components or RTTY/c.w. tones. It then forms tracking band pass filters around each one. In this way it extracts all the wanted information and leaves behind all the random clicks, bangs and hisses! Although there is no front panel adjustment of the noise reduction, there was an internal jumper setting. This could be used to optimise the NTR-1 for your listening preferences. The three options were a.m./f.m. music, a.m./f.m. voice and s.s.b./utilities.

The degree of noise reduction available depended very much on the prevailing conditions but was typically 6 to 12dB using the wide setting and 10 to 20dB when narrow was selected. From a practical point of view, this gave a very worthwhile improvement.

The final push button provided audio bandwidth selection of wide or narrow. The actual bandwidths were very well chosen with the WIDE setting providing 160 to 6600Hz - just right for short wave broadcast

reception. The NARROW setting, on the other hand, was set for utility and s.s.b. reception covering 90 to 3400Hz. One of the great advantages of d.s.p. bandpass filters is that they have excellent out-of-band rejection.

Each of the three facilities can be used in combination to provide a very versatile and dynamic noise reduction system. ■



Another view of the NTR-1 with the cover removed.

## Summary

The NTR-1 from JPS Communications certainly breaks new ground in d.s.p. for the man in the street and the simple layout belies its powerful features. One of the most important of which is its ability to automatically adapt to a wide variety of signal types. During my tests it was equally at home with both utility and broadcast signals. For more information contact **Lowe Electronics Ltd.** at **Chesterfield Road, Matlock, Derbyshire DE4 5LE.** Tel: (0629) 580800. The NTR-1 costs £199.00 inc VAT. Lowe Electronics can supply their own 12V 1A regulated supply (PSU JPS), which is specially designed to run the NTR-1, for £29.95 inc VAT.

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## Book Service Update

The Short Wave Magazine Book Service has added two useful books to its lists

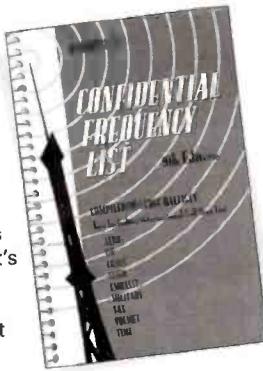
### Ferrell's Confidential Frequency List

9th Edition

Compiled by Geoff Halligey

£17.95

The latest edition of this much loved volume is now available, covering 1.6 - 28MHz in great depth all modes and utility services, with new reverse frequency against each callsign, who's using what frequency and mode, what's that callsign? These are some of the answers this book will help you find. Now includes International callsign list and revised airways area charts.



### Flight Routing 1994

Compiled by T.T. & S.J. Williams

£6.00

The A-Z Guide to airline flights within the UK

The ideal companion for airband listeners to quickly obtain the flight details of approximately 219 airlines - scheduled, charter, freight, etc. flying world-wide to and from British and Irish airports. Also included are details of many overflights between Europe, Canada and the USA.

For more details of the SWM Book Service refer to page 79.

## Receiver in a PC?

CornFocus of San Diego, have just launched an exciting new product that is a marriage of radio and computer technology.

The new product is called SoftWave and consist of an external receiver box with no controls at all, a DSP card and Software. Power is supplied by the PC, which totally controls all the receiver functions.

The software is a Windows application which enables a graphical display of the control panel, frequency display, pass band characteristics, and spectrum analyser to name a few.

Frequency coverage is continuous between 0.5 to 30MHz and 108 to 174MHz. DSP is integrated at the second i.f. at 450kHz, all controls are digitally implemented. Resolution is 1Hz, and there is an accurate display of signal strength in dBm.

Seven digital demodulators including a.m., synchronous a.m., f.m.-XP (cross product), f.m.-p.l.l. (phase locked loop), c.w., c.w.n.b. (narrow band),



c.w.t.t (tone tag).

Standard digital i.f. filter bandwidth from 11kHz to 49Hz. Tunable notch filter with 60dB attenuation. Digital audio controls including volume high and low filters.

Frequency selection can be accomplished by typing the value, clicking the slide bar, choosing from the database, or clicking directly on a signal shown on the spectrum analyser display.

Lowe Electronics have been appointed as the sole UK distributor for this fascinating product.

We will be featuring a review just as soon as we can get our hands on a unit!

For more information, contact:  
**Lowe Electronics Ltd.**  
**Chesterfield Road,**  
**Matlock, Derbyshire. Tel:**  
**(0629) 580800.**

## Review List

We frequently receive 'phone calls to the Editorial Offices requesting details of equipment reviews that have been featured in past issues. As a service to you, the reader, we have compiled a summary of such reviews covering the past 15 years. Articles from both SWM and our sister publication *Practical Wireless*, are listed. If you require a copy please send a large (minimum size 149 x 210mm) s.a.e. and two first class stamps.

# news

## National Channel Transmitter News

### Radio 1 FM

**April 14 Chesterfield**, Derbyshire using a frequency of 98.6MHz sited 5km north of the town centre providing good stereo reception to over 10000 people in and around Chesterfield.

**April 14 Cornholme** West Yorkshire located 1km north of Lydgate using a frequency of 99.3MHz serving over 9000 people in the Calderdale district of West Yorkshire.

**April 19 Walsden South**, West Yorkshire sited 8km north east of Rochdale transmitting on a frequency of 98.0MHz, giving good stereo reception to more than 3000 people in the Walsden and the surrounding rural area.

**April 19 Todmorden**, West Yorkshire using a frequency of 98.5MHz this transmitter is located at a site 2km east of Todmorden, providing good stereo reception to over 6000 people in Todmorden and the surrounding area. This site uses vertical polarisation, **not** the usual horizontal as with most other f.m. stations.

**May 3 Northampton**, sited 3km north of Northampton using a frequency of 98.5MHz. It offers good stereo reception to over 25000 people in the town and the surrounding area. All these transmitters carry Radio 2, 3, 4 and BBC local stations.

### Radio 1 & 4 Stereo for Ayr

**May 3 Lethanhill**, located 15km south east of Ayr, serving 16000 people in the Doon valley including the residents of Dalmellington, Waterside and Patna. Frequencies Radio 1: 97.9MHz, Radio 4: 94.9MHz. Lethanhill also broadcasts Radio 2 & 3, and BBC Radio Scotland on f.m.

### Television Relay Stations:

**May 10 Broadbottom**, Greater Manchester provided jointly by the BBC and the Independent Television Commission (ITC). Located 16km east south east of Manchester city centre, it brings good television and Teletext reception to approximately 600 people in Broadbottom.

#### Station Details

Channels:	BBC1 North West	39
	BBC2 North West	45

ITV Granada 42

Channel 4 49

#### Antenna Group:

B

#### Polarisation:

Vertical

#### Effective Radiated Power

2.5W (to the NE only)

**May 14 Eastbourne Old Town**, East Sussex provided jointly by the BBC and the Independent Television Commission (ITC). Located 1.5km north west of the centre of Eastbourne, it brings good television and Teletext reception to over 400 people in the old Town Centre along Parsonage Road, High Street, Lawn Avenue, Star Road, Moat Croft Road and Ocklyng Road.

#### Station Details

Channels:	BBC1 South	40
	BBC2 South	46

ITV Meridian 43

Channel 4 58

#### Antenna Group:

E or W

#### Polarisation:

Vertical

#### Effective Radiated Power

4W (to the S & W only)

Both the new Broadbottom relay and the Eastbourne Old Town relays have been built jointly by the BBC and NTL (acting on behalf of the ITC) and information on them is available from:

**NTL, Crawley Court, Winchester SO21 2QA.**

Tel: (0962) 823434.

**BBC Engineering Information, White City, 201 Wood Lane, London W12 7TS. Tel: 081-752 5040.**

# JAVIATION

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### CAMNIS HSC-050 NEW!!

At last something to consider against the MVT-7100. Basic Features: 100kHz - 2060MHz (2GHz!!) continuous coverage, 1000 channels, 10 search banks, increment steps 1kHz - 999kHz, modes AM/NFM/WFM & SSB with BFO. Same size and dimensions nearly as the AR2000.

Supplied with all accessories including 4 x AA Nicads & charger.

#### CAMNIS HSC-010

Exactly the same as  
the AOR AR2000

**£249**

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#### VHF/UHF Frequency List

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VHF/UHF Guide: £7.50 including p&p

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**Many Radio Amateurs and SWLs are puzzled. Just what are all those strange signals you can hear but not identify on the Short Wave Bands? A few of them such as CW, RTTY, Packet and Amtor you'll know – but what about the many other signals?**

**HOKA ELECTRONICS HAVE THE ANSWER!** There are some well-known CW/RTTY decoders with limited facilities and high prices, complete with expensive PROMS for upgrading etc., but then there is CODE3 from Hoka Electronics! It's up to you to make the choice – but it will be easy once you know more about Code3. Code3 works on any IBM-compatible computer with MS-DOS 2.0 or later and having at least 640K of RAM. The Code3 hardware includes a digital FSK Convertor unit with built-in 230V AC power supply and RS232 cable, ready to use. You'll also get the best software ever made to decode all kinds of data transmissions. Code3 is the most sophisticated decoder available and the best news of all is that it only costs £329!

- Morse – Manual/Auto speed follow. On screen WPM Indicator
- RTTY /Baudot/Murray/ITA2/CCITT2 plus all bit Inversions
- Sitor – CCIR 625/476-4, ARQ, SBRS/CBRS FEC, NAVTEX etc
- AX25 packet with selective callsign monitoring, 300 Baud
- Facsimile, all RPM/IOC (up to 16 shades at 1024 x 768 pixels)
- Autospec – Mk I and II with all known interleaves
- DUP-ARQ Artrac – 125 Baud Simplex ARQ
- Twinglex – 100 Baud F7BC Simplex ARQ
- ASCII – CCITT 5, variable character lengths/parity
- ARQ6-90/98 – 200 Baud Simplex ARQ
- SI-ARQ/ARQ-S – ARQ1000 simplex
- SWED-ARQ/ARQ-SWE – CCIR 518 variant
- ARQ-E/ARQ1000 Duplex
- ARQ-N – ARQ1000 Duplex variant
- ARQ-E3 – CCIR 519 variant
- POL-ARQ – 100 baud Duplex ARQ
- TDM242/ARQ-M2/4-242 CCIR 242 with 1/2/4 channels
- TDM342/ARQ-M2/4 CCIR 342-2 with 1/2/4 channels
- FEC-A – FEC100A/FEC101
- FEC-S – FEC1000 Simplex
- Sports Info. 300 Baud ASCII F7BC
- Helliscreiber – Synch./Asynch.
- Sitor RAW – (Normal Sitor but without synchronisation)
- ARQ6-70
- Baudot F7BBN
- Piccolo Mk6 12 tone/ASCII mode – coming soon!
- GMDSS 100 Baud system – coming soon!

All the above modes are pre-set with the most commonly seen baudrate setting and number of channels which can be easily changed at will whilst decoding. Multi-channel systems display ALL channels on screen *at the same time*. Split screen with one window continually displaying channel control signal status e.g. idle Alphas/Betas/RQs etc, along with all system parameter settings e.g. unshift on space, *Shift on Space*, multiple carriage returns inhibit, auto receiver drift compensation, printer on, system sub-mode. Any transmitted error correction information is used to minimise received errors. Baudot and Sitor both react correctly to third shift signals (e.g. Cyrillic) to generate ungarbled text unlike some other decoders which get 'stuck' in figures mode!

Eight options are currently available extra to the above specification as follows: 1) Oscilloscope. Displays frequency against time. Split screen storage/real time. Great for tuning and analysis. £35. 2) Piccolo Mk 6. British multi-tone system that only we can decode with a PC! £65. 3) Ascii Storage – Save to disc any decoded ascii text for later processing. £35. 4) Coquelet – French multi-tone system, again only on offer from Hoka! £65. 5) 4 Special ARQ and FEC systems i.e.. TORG-10/11, ROU-FEC/RUM-FEC, HC-ARQ (ICRC) and HNG-FEC £75. 6) Auto-classification – Why not let the PC tell YOU what the keying system is?! £65. 7) SYNOP Decoder for AAXX & BBXX formats. FULL WMO station list. £35. 8) PACTOR (both Amateur and ICRC!). £25.

*Please add £5 to the above prices for carriage by fully insured First Class Postal delivery (default method).*

Call or write for our comprehensive information leaflet – there is just not enough room here to tell you everything about Code3!

Professional users – please ask about our new CODE30 DSP unit available now! (Piccolo down to -12dB S/N!!) Prices start from £1715 (includes all options).



## HOKA ELECTRONICS (UK)

Sales Office: Ntech Communications, 36 Dallington Road, Eastbourne,  
East Sussex BN22 9EG. Tel/Fax: (0323) 507249 • Mobile: (0850) 545871



## Radio and TVDX News

An experimental 3 station digital audio broadcasting (DAB) network has been established North of Stockholm in the Enkoping and Uppsala region. The transmitters each 30-40km apart will eventually include Stockholm and encompass nearly 2 million people. All transmitters operate in Band 3 ch.E12 up to 2kW e.r.p.. The experiment is likely to be the start of a future DAB network opening late '95/'96 in the main cities of Stockholm, Gothenburg and Malmö - nearly 40% of the country's population. New legislation in Sweden will allow an expansion of broadcasting, offering two new national TV channels and up to 60 local TV stations. The two new proposed national channels will be called 'M4' and 'M5' and will cover virtually the whole population. Twenty towns will have new local TV across the country and extending into Northern Lapland.

With several CIS states either reducing or terminating the transmission hours of the national Moscow Ostankino TV channel after Moscow demanded payment for the service, Lithuania has now paid up and transmissions have resumed. Look for the corner logo 'LTV' upper left in the programmes. The text service is called 'Teleteksto Tarnyba'. Latvia has also started its own Teletext service called 'Text-Inform' and using the English alphabet, any Latvian characters are displayed without accents.

Bad news for Sunspot maximum TVDXers who in recent years received several Australian ch.0 transmitters. The expansion of TV aggregation has meant more conversion of existing v.h.f. services to u.h.f. Latest move is ABNT-0 at St. Helens and several ch.1 transmitters closing and moving to u.h.f.

A limited start to private TV in Malta with 'Super One Television' on ch.E29 operating from Ghargħur Hill. Other relays will follow though limited in power and on the same frequency. This and a second channel, now allocated to Malta, are being used by Italian private stations in Sicily and negotiations are in progress to clarify the situation.

Changes with Dutch TV - from early September the breakfast and morning programmes will move from NED-1 to NED-2; sports programmes, now on NED-2, will move to NED-3 and the text-TV network will move from NED-3 to NED-1. For DXers this means that NED-1 is on 24 hours a day and the PM5544 card is radiated at night. Scrambled business programmes will be transmitted 0200-0700 in their 'Biz-Net' service. And in Germany a new private transmitter - 'TV-Hamburg - Hamburg 1' will open on ch.E34 in the Autumn.

### New transmitter listings:

France - Bordeaux TDF-5 ch.E65 150kW e.r.p. horizontal;  
Aurillac TDF-6 ch.E67 80kW e.r.p.  
Luxembourg - closed - Dudelange RTL ch.E24 200kW horizontal

# news

## Christian Amateur Radio Conference 1994

The annual gathering of the members of the World Association of Christian Radio Amateurs and Listeners will take place over the weekend of 7 - 9 October 1994, at the Wirral Christian Conference Centre at Merton, Liverpool.

A lively programme of Christian fellowship and amateur radio activities is planned, with members and their partners expected from all over the UK and Europe. The AGM of WCRAL will be held on Saturday morning.

For more information and bookings contact **G4EZU** on (0474) 533686 or join the regular Sunday morning WACRAL NET at 8am on 3.762MHz.

## Hoka Electronics Appoint Distributor

Due to time constraints and therefore difficulties in providing the level of high service deserved by their customers, Hoka Electronics have appointed Neil Thomson of NTech Communications to take over support for all retail sales of the CODE3 and CODE30 products, upgrades and enquiries from existing customers.

Hoka Electronics (UK) will continue to act as sole importer for all the decoder products from HOKA Electronik. The change will allow them to concentrate their technical support for Government and Military customers.

**Neil Thompson,**  
**NTech Communications,**  
**36 Dalling ton Road,**  
**Hampton Park,**  
**Eastbourne, BN22 9EG.**  
**Tel/Fax: (0323) 5007249.**

## Calling All Clubs And Businesses

Send all your news and product information to Kevin Nice at the Editorial Offices in Broadstone.

## Paint Used For Screening

We have received the following from Peter Longhurst, G3ZVI at Garex Electronics.

Regarding the review of the Garex Tunable Aerial Filter. Whilst they are very pleased with the favourable comments from our reviewer, they wish to respond to one point that was raised.

The product was criticised for being housed in a plastics rather than a metal box, raising concerns that the interfering signal could be picked up again at the output.

Garex are pleased to confirm that this is not a problem since the filter has been very carefully designed. The interior of the plastics box is sprayed with an r.f. shielding paint and the filter construction is in the form of a screened trough.

## Listen With Grandad

by Leon Balen & David Levetett



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2. **\* NEW JIM PSU-101 Mk1 VC.** Now includes fitted coaxial cable assembly approx 12" long with right angle BNC plug and BNC socket for base antenna connection etc.

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3. **JIM BH-A3.** Universal base stand for handheld scanners-transceivers etc. convenient, safe support of radio. Adjustable front stop. Heavy duty chromed base. Bracket for BNC socket for base antenna connection. **PRICE £10.95.**

4. **JIM BH-A3C.** Now fitted as standard with approx. 30cm (12in.) high quality low loss 50 ohm RG58A/CU cable with professional right angle BNC plug and BNC bulkhead socket. Ideal for RX and TX up to 4GHz (no SO239 socket). **PRICE £13.95.**

5. **JIM CH-A4.** Car mounting holder for handheld scanners-transceivers with BELT CLIP support. Safe and convenient use of scanner etc. in car, truck, boat etc. **PRICE £7.95.**

6. **JIM BC-4H.** Unique FAST Universal 4 hour + 14 hour Ni-cad charger. "auto-switch-off" timer (no more guessing). Ideal Fairmate, AOR, Yupitero etc. Leads + 4 sizes of AA holders supplied. **PRICE £19.50.**

7. **JIM SM-A1** High quality S meter for scanners CB. **SPECIAL OFFER £20.** Payment by postal order or cheque.

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## Obituary - Geoff Watts

On Monday May 9, Geoff Watts BRS 3129, died of a heart attack. He was 75. He was contributing to *Short Wave Magazine* from the moment it was restarted by the late G6FO after Hitler's War.

He founded *DX News Sheet* in 1962 and ran it until 1982. In 1964 he founded the 'Islands On the Air' award. When his eyesight began to deteriorate and he had to give these activities up, both were taken over by the RSGB with Geoff's active support. Geoff also produced those exceedingly useful *Prefix Lists* - probably the best bargain in Amateur Radio - right up to the day he died. These varying activities led to him being inducted into the American *CQ Magazine*'s Hall of Fame in 1977, the **only** listener ever to be so honoured.

In his quiet sort of way, Geoff did these things from knowledge. Geoff was the first listener to have the Forty Zones confirmed - at the time of his death he had them all confirmed, a tremendous achievement.

In his earlier years, he was involved in radio and TV servicing, but he had to give up this business as transistorisation, smaller components and tighter packing densities defeated his weakened sight. His wife supported him in everything, but alas she predeceased him. Just before he passed *DXNS* over to the RSGB Geoff confessed to me that on every Tuesday evening when he processed each week's *DXNS*, he would need to use three increasingly strong pairs of spectacles before that issue could be taken to the post.

There was not an ounce of crude ambition in Geoff Watts. G3KMA, who now handles the IOTA programme, and I would agree with the present *DX News Sheet* Editor, G4DYO when he said 'The World of DX has lost a truly incredible member'. I would add, probably the greatest shortwave listener ever, and to all who knew him, a great friend.

**Paul Essery GW3KFE**

## Obituary - Simon Hamer

It is with sadness that I must report the death of Simon Hamer on Friday May 27th 1994. I had known Simon for many years, both from his reception reports and from personal visits. To me he was the true enthusiast and gained great joy and satisfaction from his reception, be it radio, TVDXing or in recent times, his first moves into satellite TV. He was well known in his local expeditions to the nearby mountain tops in an old Land Rover with Band 3 and u.h.f. Yagis and a portable TV to scour the aether for DX. As a Welsh mountain farmer, he led a tough, basic life, a hard working life and he worked hard at his DXing, for which, of course, he is acclaimed. As a friend, he was honest, reliable and a 'character'.

Only in his late 30s, and Simon was suddenly taken - it seems in many ways unfair. Yet above the mountains of North Wales, in that wide blue infinity, the spirit of Simon will live on as an encouragement to us all.

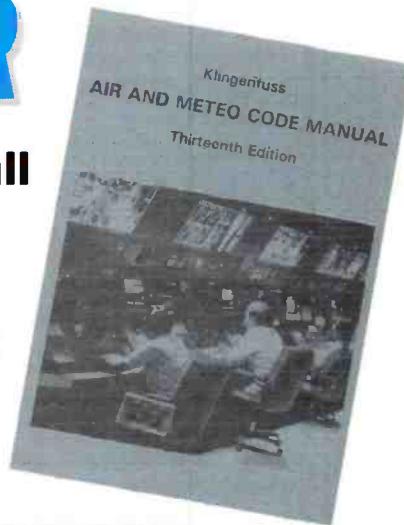
Rest in peace, Simon.

**Roger Bunney**

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Short Wave Magazine, July 1994

# Propagation

**D**uring the latter half of March, **Ron Livesey** (Edinburgh), using a 2.5in refractor telescope and a 4.0in projection screen, identified one active area on the sun's disc on days 15, 16, 19, 22, 28, 29, 30 and 31 and two on the 17th.

This trend continued into April. "Not a sunspot sighted", wrote **Patrick Moore** (Selsey) on his report for the period April 1 to 9 inclusive. He located a single spot on his projection screen at 0800 on the 10th again at 1000 on the 11th and at 1400 on the 19th. Patrick kindly made a drawing from his screen of the three he saw at 0920 on the 25th, **Fig. 1**. However, once again he had nothing to report from his early morning observation on the 29th and 30th.

## Eclipse

There are strong words to describe the following, but I will not use them here. Throughout the afternoon of May 10 the sun was mainly bright and clear. At 1815, just before the solar eclipse was due to begin, I was projecting a good clear image of the sun's disc on a white paper screen hanging on the wall. My plan was to photograph the image at one stage during the event ready for this column. Having carefully set the stage the sky began rapidly clouding over so, like many others, I saw nothing of the eclipse.

## Auroral

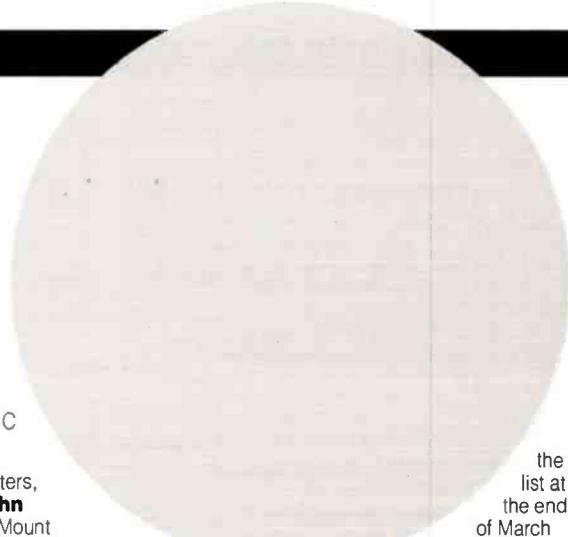
Ron Livesey, the auroral co-ordinator for the British Astronomical Association, received reports of visual aurora described as 'glow' during the overnight period on March 5/6, 11/12, 13/14 & 15/16; 'quiet arc or band' on 2/3, 5/6, 8/9, 11/12,

15/16, 16-18, 19/20, 21-23 & 24/25; 'ray bundles' on 7/8, 8/9 & 11/12; 'active, moving and flaming' on 2/3, 6-11, 12/13, 14/15, 17/18 & 20/21 and 'coronal structure' on 5/6 & 7/8, from many observers ranging from Scotland to North America. These include the Met. stations at West Freuch, RAF Kinloss, Kirkwall and Sumburgh and the American Continental Met. stations at Alexandria, Broadview, Helena, Houlton, Jamestown, Kelowna, Meadow Lake, Prince George, St. Leonard, Sioux Lookout, Timmins, Thomson and Wabush Lake.

Between them, **Ford White** (Portland) and **Ern Warwick** (Plymouth) tell me that the German beacon, DK0WCY, on 10.144MHz, gave strong auroral warnings at 1630 on March 7, 1400 on the 14th and 1247 on April 17. **Bob Evans** of the RNZAS told Ron Livesey that April was a very busy month for aurora in the southern hemisphere.

Judging from various adverts in astronomical and computer magazines, there are some good astronomy programs on the market for computers from which you can familiarise yourself with the night sky in both hemispheres.

**Fig. 1.**



## Magnetic

The various magnetometers, used by **John Fletcher** (Mount Tuffley), **Andy Hollis** (Winsford), **Tony Hopwood** (Upton-On-Severn), **Karl Lewis** (Saltash), Ron Livesey, **David Pettitt** (Carlisle) and **Tom Rackham** (Goostrey), between them, recorded strong disturbances to the earth's magnetic field on March 2, 6 to 15 inclusive, 17, 18, 21 and 25. In addition, Tony Hopwood and Tom Rackham reported "reduced h.f. propagation" on days 3, 8-13 and partially on the 22nd and 28th.

## Propagation Beacons

As always, my thanks are due to **Gordon Foote** (Bristol), **Cmdr. Henry Hatfield** (Sevenoaks), **Ted Owen** (Maldon), Ern Warwick and Ford White for their 28MHz beacon logs and comments about band conditions. From these reports I compiled the chart seen in **Fig. 2**. Ern, Ford and Ted added LU4XS, to

the list at the end of March and Gordon caught that lone signal from ZS5VHF on March 26. **Ian McDermid** (Comrie) found the 28MHz band 'dead' from April 14 to 18. However, for about 10 minutes around 1430 on the 14th, he heard a few East European amateurs, operating c.w. on 29.410MHz. Could have been a short burst of Sporadic-E, Ian. It seems that the path between South Africa and the UK was the only one that showed any consistency throughout the period covered by **Fig. 2**.

## Atmospheric Pressure

Details of the daily changes in atmospheric pressure for the period March 26 to April 25 can be seen in my 'DXTV News' column elsewhere in this issue.

**Fig. 2.**

Beacon	March												April																	
	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
DK0TEN									x		x										x	x				x				
DLOIGI										x												x				x				
EA3JA											x		x															x		
HG5GEW											x											x			x	x				
IK1PCB											x											x	x		x					
IY4M											x											x	x	x	x	x				
LU4XS					x	x																								
OH2TEN							x																							
SK5TEN							x																							
SV3AQR																						x								
S55ZRS											x		x									x	x				x	x		
WA4SLT						x																								
ZS1J	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
ZS1LA	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
ZS5VHF	x																													
ZS6PW	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
Z21ANB	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
5B4CY	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		

## Propagation Charts Explained

Last month we featured our pilot propagation forecasts, and the day that the magazine went on sale we received a considerable amount of positive feed back. One aspect mentioned was that we had not given any instructions on how to interpret the charts, so here we go.

The charts contain three plots. The lower dashed line represents the lowest usable frequency (LUF), the bold middle line indicates the optimum working frequency (OWF) and the upper dashed line represents the maximum usable frequency (MUF). 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. All the charts are for a listener in the UK, of course.

## Example

Using the June 94 charts on page 65. Listening to stations from South America at 1400 UTC, the minimum usable frequency is about 11MHz the maximum is just over 20MHz, with the optimum being roughly 17.5MHz. We hope that makes it a little more clear to those of you who have not used this kind of chart before.

# Amateur Bands Round-up

## Listening to the Amateurs

Many readers go out and buy a new bit of gear every so often. However, whether new or second-hand, modern equipment needs to come with the instruction book - particularly if it is one of these press-button wonders that lacks a tuning-knob. However, do beware of the precise words used in the instructions, and if the specified button-presses don't produce the specified result, don't instantly give up!

I recently got hold of a v.h.f. 'handy' and wished to program in the eight repeater and some simplex channels. No problem! Just a string of button-presses. One snag: the display resulting after the button-pressing was totally different from the one expected. It was only after repeating the exercise several times that I rumbled that in fact the information had been accepted, but that a further button needed to be pressed before the display 'came right.' The 'book of words' made no reference to either the display or to the need for another press. A complete paragraph seemed to be absent. Note you, this was from a maker who is normally noted for good instruction books.

Manufacturers all, please take heed!

### Heat-wave

As I write, the early-May Bank Holiday Heat-wave has turned into the usual breezes-and-showers of Spring. When, for Pete's sake, will the Clerk of the Weather realise that short wave listeners do not wish to be troubled by repeated gardening chores?? Or should we just blame the Government?

**Harry Richards** in Barton-on-Humber usually listens in the morning when the Americans come on; he likes to listen to the European-American traffic. However, he did have a listen round late one evening (2334UTC) and came across W5RRR, the Houston Space Centre knocking off a pile-up. However, as Harry sadly remarks, not only can the band open, but it can **close** too! I might ask that possibly the W5RRR operators may have sensed that propagation was changing and turned their beam in a new direction as well.

Next, **Paul Clark** in Rochford has a puzzle for us. He used to live in the 'service area' of GB3NL (! sympathise!!) but now he is thirty or

more miles away; his scanner stopped on R7 and he heard what he copied as 'GB3TE.' There is indeed a GB3TE repeater, on the other side of the Thames although the map in the '94 RSGB Call Book shows it as being on channel R3. I understand, though, that this particular machine has since moved to R7.

While it is true that v.h.f. signals are normally 'line-of-sight' over flat country, one must recall that there are some strange lines of sight(!). Thus, taking the local GB3PW, it is by no means unusual for signals to 'open the box' from as far away as the high stretches of the M62. The ops themselves, of course, are getting the strong GB3RF signal and are usually quite unaware they are opening more than one repeater. Between Shrewsbury and Market Drayton one may well find that one hears GB3PW, GB3RF and GB3FR; one in Mid-Wales, one near Burnley, and one in Lincolnshire. One of the prime tasks of the RSGB's Repeater Management Group is to try and organise things so this happens as little as possible. However, that having been said, if a high-pressure weather area creates a 'lift', the best-laid plans can come unstuck until the lift is over, as the 'Do not adjust your TV set' notices on your picture testify.

Up to Hawick in the Borders to **Mark Borthwick** next. Mark found the state of the bands somewhat depressing - though at the time of writing in the early part of May things seemed to be improving a bit - but was cheered by QSLs inwards from J28RD, SU1MT, YI1HS and C53HG. On Top Band, Mark logged C31U and C31SD plus SP and SM. The best on 3.5MHz was 4Z4KX, while 7MHz came across with SV9ANH, 4X4BE, 4X6SI, OD5ZZ, EA8BVG, EA8TH, VA2ZZ, VE9MY, OX3HU, OX3DU, HJ6WQH, 7X2JF, 9Q5TR, A92BE, CN8NS, 9K2CS, WP4Q, P3NE, YB6INU, VK4MZ and VK6VKV. On 14MHz, V63SD on Yap was the prize, followed by 4X4FR, 4Z4DX, 4X2A, 4X4RE, 4X1TD, 4Z0SI (for a 'special'), TU2JL, a low-power signal from UA9JAW, OD5MM, OD5PL, OD5VT/P, OD5RZ, 9K2/OE6EEG, 9K2ZC, 9K2ZM, JA6YO, 5B4ES, 5B4ADA, VO1MZ, YB6INA, YB3AQF, VK2AHJ, VK2AU, VK3FKD, VK2BIR, VK4GO, VK5HA, 4K2/OE2SJL, 4K2MAL (Franz Josef Land), E28DX (Thailand), VU2RAK, 5N8NDP, 9Q5TR, S21ZG, XX9TZ.

V85CA, V85BG, 4U1ITU, 4U1UN, WP4WS, 8P9FC, 9H1SV, 9H4B, 7X5VBK, I4AFQ on low power, EA8BTA, 5B4KH, 9V1ZI, 9V1XB, 9M2HB, 9M2ZA, YU70AHI for another special, HG275BCS for another and W6NZX/7 in Utah. As for 18MHz 4X1MO was noted, and on 21MHz JRGUM on Okinawa, 9K2ZZ, AA3HA, W0CG, 7X2RO, PY2LI and assorted East Coast Ws.

**Geoff Crowley's** move from Iceland to Ecuador didn't come off, so he's living in Aberdeen and working in the North Sea. At his new home, Geoff has been able to get up a half-sized G5RV, and having compared it against the Datong AD370 active antenna he used in Iceland, Geoff reckons he's well impressed with the Datong. The antennas feed into a home-brew tuner, an r.f. notch filter, FRG-7700 and a dual MFJ audio filter to make an effective listening post. Incidentally, while Geoff did manage to get a call in Iceland - TF3XXT - he has not done so here as yet, simply because SSL have done their usual thing and twice shipped him the wrong papers. (As I closed, I heard that at least he now has the correct papers - getting it right once out of three seems a bit better than usual for SSL!)

On a point of operating, Geoff Crowley and others mention 9K2ZZ asking for complete callsigns from the pile-up and being inundated with idiots giving the last two letters of their calls. To be fair to the idiots, though, it is up to the DX station to control the pack. If the op calls for full calls, then he must not accept shortened calls, and indeed he must tell the pack clearly and unequivocally that there is no way he will give them a contact. Just take one of them, and the whole gang are encouraged. Personally I feel partial calls are not only plain liddery but they are not even within licence conditions either!

In the last few weeks there have been reports here and there of plans to activate Yemen, by N4CGK as 700CW in July, the licence having been granted after several years of negotiation; however, the news from Yemen of civil war during the past couple of weeks suggests that this one will be a busted flush.

The topic of sunspots comes up again, not surprisingly in view of the recent antics of Old Sol. To try and sum this up, in the absence of any other effects, a high sunspot number or solar flux figure tends to

create a higher maximum usable frequency and 'better conditions'. The effects of the sun on the earth's magnetic field, measured either as an Aa or Ap index, or a K figure, or a measure in nanoteslas, tend to be negative for h.f. signals. You are 'stuck with' whatever spots the sun gives, and even at the very bottom of the cycle world-wide communication is possible; so to make the best of things you are hoping for a low value of A or K. A K value over three is decidedly unhelpful. Coronal holes are often the culprits. The DK0WCY beacon gives the very latest details on 10MHz; if your Morse isn't up to copying it down direct, record it on tape and 'undo it' bit by bit. I know this paragraph is a gross oversimplification, but if it helps someone to get a better grip on the bands, I'll be happy!

**Ted Trowell** of the Isle of Sheppey is back out of the bandage-factory and comments that they are fitting so much plastics into him he is auditioning for Bionic Man! Still, being on the mend and back in the shack is the main thing, even if it is 'take it easy' for a while.

Bringing up the rear is **Luciano Marcquardt** from Hereford; he notes 8P9GG on 7MHz, 9Q5TR on 14MHz and 9Q5KM plus X5BYZ both on 21MHz for new ones. On 28MHz Luciano found ZS6PW, CE3MCJ and ZP5FZD, and even on 21MHz propagation was mainly north-south with 7X2WAK, CN2GF, LU7FPI, D2SA, Z32A, ZS6YA and KP4IX. On 14MHz there were times when the band opened to Japan, VK and ZL, and into North America - much more east-west propagation. This brings out another point about propagation in that if the m.u.f. is, say, rising so that a given band starts to open, the first signals will usually be north-south paths. Then as the m.u.f. rises more still the band starts to carry signals in east-west direction. On the falling trend, the same thing occurs, so often the presence of signals on a north-south path is a hint to watch out for the band closing.

### Finale

That's it for another time. Letters to Box 4, Newtown SY16 1ZZ to reach me by the beginning of the month please. Till then, let's hope the band conditions improve and the grass doesn't grow!

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# DXTV Round-up

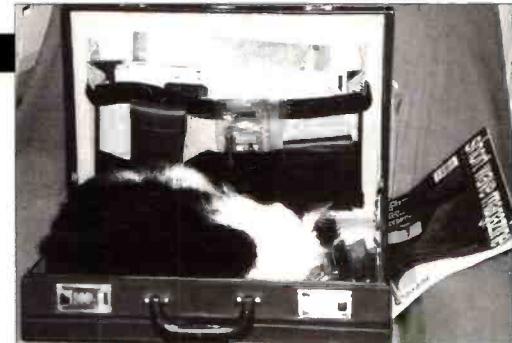


Fig. 1.

Long distance (DX) television signals, arriving by all modes of propagation, have featured in this column and in its predecessor in our sister magazine *Practical Wireless*, for a long time. In recent years I have gradually introduced, where applicable, astronomy, computing, satellite, slow scan and vintage television and, of course, the weather. All of these subjects began with a comment, report or request for information in one or more of your letters.

## Data Transfer

In the lower half of my briefcase I carry a Tandy WP2 lap-top word processor and the latest issues of *PW* and *Short Wave Magazine*. Recently, I had work for this column on the portable, but, before making a start, I opened my briefcase and went back downstairs to fetch a newly purchased computer magazine. On my return, Henry, our eighth cat (!), Fig. 1, was asleep on the lap-top, which meant that the transfer of data from the WP2 to the Packard Bell PC in my office had to wait several hours until our bone idle cat awoke. When he was a kitten and spotted snooker on the TV he would jump up and pat the screen as the balls moved across the table!

## Band I

Although, at the time of writing, early May, Band I is still very quiet, Peter Barber (Coventry) received signals that were too weak to identify on Ch. E2 (48.25MHz) on April 25, Ch. E3 (55.25MHz) on days 6 and 22-25, Ch. E4 (62.25MHz) on the 23rd and 25th, Ch. Ia (53.75MHz) on the 22nd and 25th and Ch. R2 (59.25MHz) on the 7th, 21st and 23rd. However at 1058 on the 21st, Peter identified a programme schedule from Norway (NRK) on Ch. E4.

## Meteors

During the April Lyrids meteor shower, Simon Hamer (New Radnor) saw 'pings' of pictures from stations in Sweden (SVT1), Norway (NRK) and Denmark (DR), in Band I, on Chs. E2, E3 and E4 respectively. These pictures were received, because, momentarily, they were deflected over a wide area by the trails of ionised gas left in the earth's atmosphere by decaying meteor particles. Although random, these particles are entering our atmosphere all the time. Their numbers greatly increase as our globe, on its annual orbit around the sun, periodically encounters great swarms of these particles. Such events, which may last for a day each side of a predicted peak, are called meteor showers.

It's worth taking a look at the heavens on a clear dark night and it won't be long before you see a streak of bright light dart across the sky. That streak is the burning trail left by a tiny bit of rock from interplanetary space that has collided with our atmosphere.

## Satellite TV

From the picture archives of Peter de Jong (Leiden, Holland) comes a couple of captions that he received from Eutelsat II F3, Fig. 2 and Astra 1b, Fig. 4, on June 26 and 28 December 1992, respectively. For the benefit of the radio buffs among you, Simon Hamer tells me that, via the ASTRA satellite, "RTE Radio 1 is on Transponder 22/subcarrier 7.56MHz with RTE 2FM being carried overnight" and that the local Irish Limerick 95FM, also on Transponder 22, is on subcarrier 7.92MHz.

## Weather

During April, I recorded 3.45in of rain compared with 4.93in for the same period in 1993. This was spread over 16 of the 30 days in the month with

amounts of more than 0.50in on days 1, 4 and 9. April began dull and cold and ended sunny and warm. After a sudden short lived hail storm on the 2nd, I took a random selection of stones from the garden and found that they measured between 7 and 10mm. We had approximately 1.0in of snow before it turned to rain on the 9th. "After blizzards in Easter week we have since had some nice warm sunny weather," wrote Ron Livesey (Edinburgh) so it seems that both ends of the UK had similar conditions in April.

**George Garden** (Edinburgh) refers to 'the predominantly low pressure we've had nearly all this year' not being much good for DXing on the TV bands. He tells me that he has experienced wet windy snow showers and high winds, and adds that the Aberdeen - Elgin road was blocked with snow early in April and the Inverness train services were subject to severe delay.

The daily variations in atmospheric pressure for the period March 26 to April 25, Fig. 10, were taken at noon and midnight from the recording chart on my own barograph.

## Tropospheric

April 10 was a warm sunny day and as the pressure had been rising all weekend George Garden decided to check the u.h.f. bands. His efforts were rewarded between 0001 and 0100 on the 11th with varying strength pictures from the Bilsdale transmitter of Tyne Tees TV which is rare at his location. The last time was in November 1993.

Simon Hamer reports receiving pictures from Denmark (DR) on Ch. E8 and Germany (MDR1 & WDR1) on Chs. E6 and E9 in Band III and Denmark (TV2) on Ch. E30 and Germany (MDR3 & ZDF) on Chs. E34 and E37 respectively on the u.h.f. bands during a tropospheric opening on April 11 and 12. While the event

was in progress he also saw 'improved tropo' signals, on u.h.f., from Belgium, Eire, France and Holland.

Tim Bucknall found a u.h.f. opening on May 6 when he logged pictures from the TV transmitters at Belmont, Crystal Palace, Emley Moor, Macclesfield, Overbiddulph and Saddleworth, from his home in Congleton. Tim may also have received signals from RTE on Ch. E40.

## SSTV

**John Scott** (Glasgow) is a member of the radio clubs in Glasgow and Paisley and, while at the latter, he arranged for GM0NAF to send him slow-scan television pictures on 144.5MHz at 2300. All went well and the caption, transmitted via a Spectrum computer, Fig. 3, was received by John at good strength. This test shows that the now elderly Spectrum is a very useful tool and that there is a good v.h.f. path between Glasgow and Paisley.

During April John copied a variety of slow-scan captions, between 14.227 and 14.233MHz, from stations in France, Fig. 5, Hungary, Fig. 6, Portugal, Fig. 7, Spain, Fig. 8 and Russia. For the benefit of newcomers to this mode of communication, the lines across the mouth in Fig. 5 and below the ears in Fig. 6 are caused by interference. These two signals must have been strong and John's receiver accurately tuned to allow the pictures to appear against such hefty and perhaps locally generated electrical noise.

## 405 Line

I have just started reading a new book called, *Wires, Wheels and Wings (A Wireless Mechanic's Diary)* by Harry Reddin and published by The Pentland Press Ltd at £16.50. (ISBN: 1 85821 128X). Harry, a

Fig. 10.

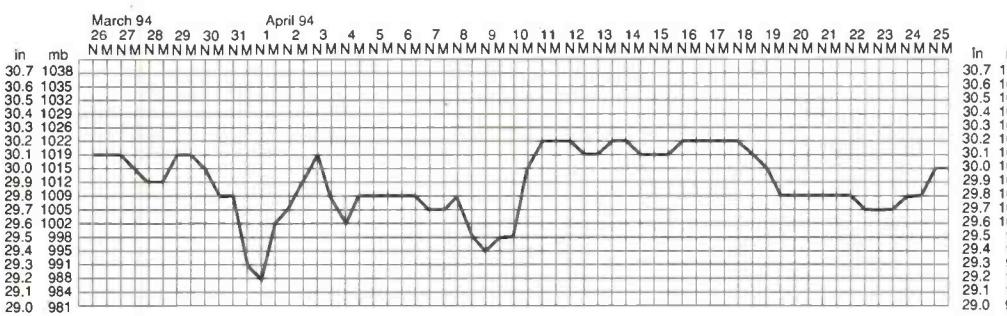


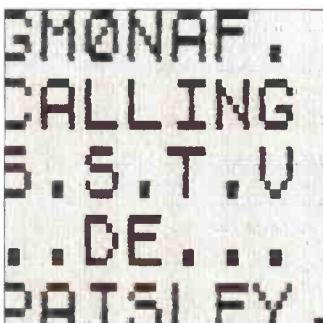
Fig. 2.



lifelong radio engineer, had first hand knowledge of the pre-1939 television service from London's Alexandra Palace and his following comments should interest and caution the collectors and 405-line enthusiasts among you. He says, the "Receivers were heavy by weight and price" and that "the extra high tension voltage required by the cathode ray tube" was provided by a large mains transformer in the bottom of the console cabinet and "properly labelled 'lethal'." (I have also enjoyed reading this book and a review will follow in a future issue of SWM - Ed).

## Collectors

Vintage TV receivers often come to light during the summer months at 'Junk' sales, car-boot sales, various rallies and ousted from the loft or garage by people on the move. Many of these sets, like the Philips, Bush and Pye, left to right respectively in **Fig. 9**, are now over 40 years old and must be handled both electrically and mechanically with great care. Please keep in mind that most of these sets were designed to work with a **LIVE** chassis and this really means that every metal part, including chassis bolts and control knob fixing screws will be at mains potential.



**Fig. 3.**

**Fig. 4.**

relative to earth. That is why the makers went to great lengths to conceal knob screws, protect exposed bolts with an insulating material and isolate the antenna sockets with special capacitors.

Also **BEWARE** of the kilovolts of Extra High Tension around the cathode ray tube and the line-time-base circuits. There are at least two reasons why it is wise to keep your hands away from a set while it is running. The first is the risk of lethal electric shock and the second is that the valves run very hot and will burn your skin if touched.

## Not For DXing

In general, the three sets in **Fig. 9**, made in the late 1940s, were restricted to channel 1 (45MHz) in Band I. You may find some later models that can tune though the band with some form of five channel tuner. However, don't get excited, they are unsuitable for DXing because they were made for 405-line signals, not the 625-line transmissions currently used on all the TV bands. Each of the three televisions in **Fig. 9** have 9in cathode ray tubes and their screens fit into a flexible rubber moulding which is bolted to the front of the cabinet. This may be perished with bits sticking to the glass at the front of the tube so exercise great care. If you decide to remove the chassis make sure that the front of the tube is supported when it pulls clear of the moulding. Before removing the chassis study the tube carefully and if it appears even slightly WHITE inside, be cautious because this is a sign that the tube is 'soft' and the cracked glass could shatter in your hands.

## EF50

In the late 1930s Mullard developed and produced the famous EF50 valve for v.h.f. receivers. Multitudes of them were used in Radar equipment throughout WWII under the RAF number VR91, (Valve Receiving 91 = CV1091 = EF50). If you have not met this valve before, it has a silver or red metal case, nine tiny pins



**Fig. 5.**



**Fig. 7.**



**Fig. 6.**

and a large locating spigot in the centre of the base. For a short period after the war the EF50 was commonly used in a range of televisions including those in **Fig. 9**. I mention this because, after 40 years and possibly damp storage, the renovators among you may find corrosion on the valve's pin connections and in its holder. In some sets, the EF50 was held into its socket by a threaded collar which slid over the top of the valve and screwed to a fixed thread around its base. Alternatively, a circular spring clip was used to hold the valve when it was pushed home. Before it can be unplugged, both sides of the clip must be held down to allow free movement. Once clear of the clamp the valve should come out without trouble. At this point closely examine each pin and its associated socket for tarnish or corrosion.

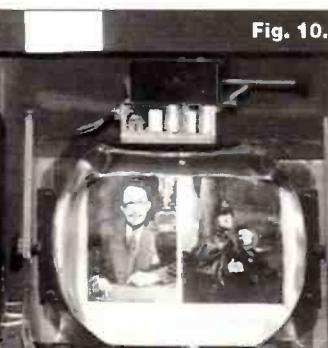
Speaking from memory, the heaters of the valves in the Bush and the Pye are wired in series, therefore any corrosion on the heater pins could cause a drop or a fluctuating voltage on the heater-chain and this would be bad for all the valves in the system.

## Magnifiers

Another item from the early 1950s, often sought after by television collectors, is the magnifier seen in front of the Pye on the right of **Fig. 9**. I can recall three types of magnifier. One hung over the front of the set and was held by straps which went across the top of the cabinet and were secured by the back-screws. The model in **Fig. 9** had two long feet, that went under the base of the cabinet, and two slotted support arms. The magnifier was positioned through the slots by a large screw on each side designed for vertical adjustment. The other was made for console cabinets. Its adjusters were similar to the one in the picture but it had a more robust, floor standing, framework. If one comes your way after all these years watch where you keep it. Do not let sunlight at it for two important reasons, the first it will discolour the liquid inside the magnifier and the second, it could act like a 'burning glass' and set something alight. The magnification of the photograph on the tube in **Fig. 9** is a good example of how well they worked.

## Cabinets

The Philips and the Pye have wooden cabinets and the Bush is made of Bakelite. When these sets were built we were still in the era of 'father's wireless' which was expensive and stood in the corner of the living room and was the family's only entertainment. Money was not plentiful at the end of the war and television was new and expensive. Another problem was the limited hours of transmission, a trade test-card in the morning, accompanied



**Fig. 10.**

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# Satellite TV News

## The Latest from the Clarke Belt

The main satellite activities across the Clarke Belt since the last chronicle within these pages was the South African election of Nelson Mandela. This maintained almost a permanent transponder distribution circuit across Europe running news feeds up from Johannesburg and the Cape, in between contributions the test card and caption 'EBU Johannesburg Path 1' on Eutelsat II F4 at 7°E.

Though the signal is in the clear, distribution is with sound in syncs (SIS) that produces considerable picture wobble related to the accompanying audio. The 7°E distribution is a secondary Ku band satellite hop, all primary feeds out of South Africa used C Band at 4GHz. Few satellite enthusiasts use C Band mainly due to the large size of dish required - for serious work in excess of 2m is a minimum.

**Ian Waller** (Lincoln Satellite Ltd., Lincoln) is an experienced C Band operator and advises that the primary Path 1 feed was carried on Intelsat 502 at 21°W 3.73GHz. In total there were three EBU primary C Band 'paths' using Intelsats' 604 at 60°E and 605 at 24°W, together with WTN/Starbird and CBS/SKY individual primary circuits on 502 21°W - five north-bound C Band feeder circuits in total. Ian also feels that additional digital circuits on 502 could have carried more news feeds and certainly the 'Newsfuse' Cyprus-based SNG crew used digital compression for their African uplinks - this enabled use of lower uplink powers and smaller dishes. Though most of the originating feeds were ex J'burg I noted a Cape Town insert one evening, again SIS.

Whilst in the C Band mode, Ian has received via Arabsat 1D 20°E at 4.08GHz a clear PAL downlink detailing the upcoming Orbit International digitally compressed services available on this bird shortly.

May 13 heralded a remarkable social event at 10.080GHz vertical on Eutelsat 2 F4 at 7°E - well within the EBU leased section of this bird though in straight PAL and not SIS - 'Superfest '94'. This seemed to be a corporate video occasion of general wine and dining, socialising and joking. The staff were having a wonderful time that seemed to be a nation-wide event with remote inserts and 'phone-ins from around the UK. Unlike most corporate hookups that are generally conducted formally, the Esso crowd were relaxed and happy in a very informal atmosphere!

In answer to a John Locker (Wirral) query on 'slant track' that I mentioned in the May '94 column, **Chris Booth** (Alton) advises that this caption,

originated from the ABC News Centre in Washington and the 'slant track' referred to a videotape machine, most likely a 1in C-format reel-to-reel made by Ampex, Sony or RCA. The slant track itself relates to the actual recording tape that wraps around the tape head and is helically scanned across the tape (at an angle). Generally Beta SP is now used for news gathering.

And going back into the archives and our September 1993 issue and John Locker again - he received a BBC Glasgow caption and VT clock by satellite with identification numbers 'LRP R 056R'. This indicates that it's a London based religious programme and the R 056 identifies the programme *People on the Way* and the final R is a check digit to ensure the number is valid - this type of programme coding is now used within the computerised library and costing environment of the BBC. 'A Roll' means that there is a 'B roll', i.e. at least two video tapes, this enables two tapes to be run simultaneously and mixed between the 2 for a programme output. So now you all know! My thanks to Chris for his help.

**John Locker** himself now takes the stand - good news for sat-zappers as he has received very strong carriers from the new Russian GALS-1 satellite at 44°E, in total 4 Ku band transponders were seen with levels thought in excess of 55dBW - that is very strong and up to Astra levels. Previously only very weak signals had been seen in the UK.

John was heavily involved with the educational Jason project in Liverpool so if any readers visited this event/satellite hookup then you would have seen John. He worked on the project for 12 days early March with live links between Belize and the UK - Croughton and the Liverpool Maritime Museum. The rainforest uplink was via Galaxy 7 at 91°W into the PanAmSat

facility in Florida where it was further uplinked via PAS-1 at 45°W into Europe. All audio, video and computer link-ups were carried on this devious route using digital compression. The UK end (and John Locker) received great help from Steve Cadden and colleagues at PanAmSat, the Liverpool Maritime Museum staff were also very hospitable - in all a good time was had by all.

It is perhaps worth advising SWM readers to check out 1995's Jason project as Doctor Ballard is considering involving NASA and orbiting Astronauts and Cosmonauts. Barclays Life sponsored the 1994 and will back the '95 project again - end of commercial!

From Dunshaughlin, Republic of Ireland, **Aidan Murphy E15HW** writes to tell of his satellite aspirations and experiences. Aidan uses a 1.2m offset Channel Master dish, a 0.7dB noise Ku band LNB and Manhattan 9000 receiver. On his trip across the Clarke Belt May 6 he came across no less than 4 Eutelsat I F4 transponders (a mature satellite at 25°E but still giving good service) fired up and offering various outside broadcast feeds of the official Channel Tunnel opening from Calais.

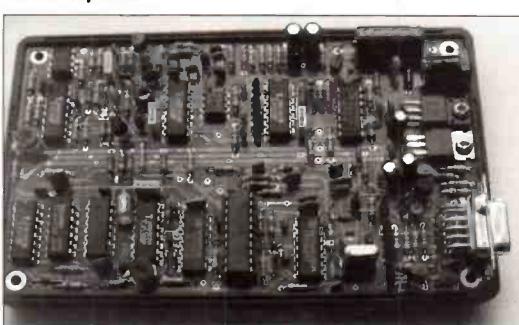
Earlier in the month Dover had featured in a live programme insert concerning booze trips and day trippers evading (avoiding perhaps) UK tax on wines and spirits. Another May 6 signal Aidan logged was at 11.160GHz of a University uplink via Eutelsat II F3 16°E between the Universities of Nottingham, Leeds, Ulster and Amsterdam concerning the use of AV techniques in business.

Incidentally it's well worth checking out Eutelsat I F4 at 25°E on 11.011GHz horizontal since ITN have now taken a permanent lease on this transponder for UK/European SNG work.

Help! I've had a query from

**Below, left:** Two years ago a German SNG truck operating within the USSR would have been unheard of! Now special bargain prices are offered! TVRO refers to a 'TV Receive Only' terminal which many broadcast stations now own. Below, right: Unstable pictures, such as occur with the use of SIS (Sound in Synchs), can be locked solid using a 'sync inserter', such as the clever unit seen here, made by Premier Video Products, Wolverhampton.

TELEKOM  
TV transmission from Kiev / Ukraine  
Telekom offers a Up-link station in Kiev until end of may 1994.  
The TV Signal will be transmitted via EUTELSAT, the Down-links  
can be arranged by TELEKOM or your own TVRO.  
  
Price for Up-link per feed:  
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additional 5 minutes 150,- DM  
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Contact our booking center: +49 09 211 5660 or 5661



PM5544 test card via Eutelsat II F4 at 7°E - 11.163GHz vertical.



Reuters have been conducting digital compression tests via their leased transponder on Intelsat K.



An EBU distribution feed ex-Cape Town, South Africa. The signal is using SIS hence the unstable image which moves with accompanying audio.

**Nicholas Earley** in Victoria, Australia who is looking for a source of MMDS converters and receiving equipment. This is terrestrial microwave distribution gear operating at 2.5GHz. and commonly used for PAY-TV programme distribution in the States, Eire and the Middle East. I'll pass any information on to Nicholas.

I cannot let the annual EBU event go by without a mention - the 1994 Eurovision Song Contest was again held in Dublin April 30 with the EBU leased transponders on 7°E (they have 6 in total) being used for main video outputs (2 trds) and with reverse video inputs into Dublin on 2 other transducers - these being for judging with both picture and sound - traditionally remote judging details have been via audio circuits only.

# Bandscan

## Europe

A sea-change is occurring in European international radio stations. Radio Netherlands has announced the results of a far-reaching review of its operations. The result is that the station will in future be concentrating more resources on providing services to Europe, at the same time cutting back on its overseas operations.

The station plans to stop broadcasting in Arabic, in French to Africa, in Indonesian to the Asia-Pacific region, in Portuguese to Brazil. At the same time, English services will be expanded, and more effort will be put into serving East European audiences. Additional money will be put into getting Radio Netherlands programmes on local stations through re-broadcasting deals.

Bert Steinkamp, Director of Planning and Development at the Hilversum-based broadcaster, told me: "Our budget is secure for the time-being. We do not face budget cutbacks. But we must use our resources in the most efficient way. Audience research shows that only 1 million people listen to our Indonesian broadcasts. The expenditure for the Indonesian service cannot be justified with such small audiences."

The English language service increased the length of time it is on the air by starting three hour blocks instead of the 55 minute transmissions established many years ago. That makes tuning in more worthwhile for listeners. It is likely that Radio Netherlands will find additional ways of reaching its audiences in Europe instead of simply relying on short wave out of the Flevo transmitting station. Perhaps an audio sub-carrier on Astra is imminent. Already some of the station's programmes can be heard via the World Radio Network service on Astra.

## Swiss Radio International

Further south in Berne, Swiss Radio International has introduced a 24 hour-a-day English service that is heard on Astra. Tune into transponder 9, the Teleclub film channel, at 11.332GHz, and the audio sub-carrier of 7.38MHz. News is on the hour every hour, with current affairs coverage too, and at half past each hour, feature programmes will be broadcast. Existing features like *Grapevine* and the *Swiss Short Wave Merry-go-Round* will be incorporated into new



**Radio Netherlands short wave transmitting station is situated at Flevo.**

programmes, including a media show.

Short wave transmissions in English will continue, but concentrated on peak listening hours, including breakfast time, lunch time and the evening hours.

Meanwhile the station is now co-operating with Swiss domestic radio in the French-speaking part of the country to produce a French satellite service on Eutelsat. Since May 2, SRI has been working with Radio Romande, La Première, Espace 2 and Colour 3 to present Switzerland to a pan-European audience in another principal language of the continent.

## RVI

Radio Vlaanderen International, the Belgian international broadcaster, has started to use Astra for programme delivery. It is using the audio sub-carrier of 7.380MHz on the Filmnet transponder at 10.921GHz. RVI programmes are also carried on World Radio Network, and Radio France International's English programmes are on WRN at 1200UTC.

## Central Europe

Three former Soviet-satellite states are benefiting from an American media firm's initiative to produce an English language programme called *Central Europe Today*. The Czech Republic, Poland and Hungary have been chosen by Word Up Inc as the first areas where the programme will be heard. It is made in Budapest, and sent to the World Radio Network offices in London where it is uplinked to the Astra satellite. At present, the f.m. stations Radio Metropolis in Prague, Bridge in Budapest and Kolor in Warsaw re-broadcast the thirty-minute programme which includes international and business news, cultural information and interviews. The prime audience is seen as local business people and

visitors and English-speaking expatriates in the three capital cities.

## Maintaining Faith

Some European broadcasters continue to operate much as they have done for years, maintaining their faith in short wave as the most appropriate, and probably cost-effective way, to reach audiences overseas. RAI, Italy's state broadcaster, has started to hire time on the BBC's Atlantic Ocean Relay station on Ascension Island to beam its Italian language programmes to South America. The station signs-on at 0130 on 15.390 and 11.765MHz after the closedown of the BBC's Spanish Service. I wonder, however, how many Italian speaking short wave listeners there are in Latin America.

## DAB

Digital radio is just around the corner in Europe. As I have reported in past *Bandscan Europe* columns, the BBC has been testing Digital Audio Broadcasting or DAB in the London area. A service relaying the five national BBC channels is likely to be launched in a year's time.

In Sweden, DAB is likely to be used to launch a Finnish-speaking channel to be called Radio Sisu. There is a sizeable Finnish-speaking minority of about 400,000 in Sweden where the total population is just 8 million.

In France, DAB is up and running in the Paris region, relaying ten separate stations, including Radio France International.

The only drawback for potential listeners at present is that there are no DAB receivers on the market. The first sets are likely to be available next year, costing around £1000. Car receivers will go on sale soon after the first domestic sets are launched, and the price structure is likely to follow that of the CD player, dropping rapidly as the market expands.

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Cardiff CF4 8JN

**The Radio Place,**  
5675-A Power Inn Road,  
Sacramento, CA95824, USA

**Tucker Electronics,**  
1801 Reserve Street,  
Gasland, TX 75042,  
USA

**Ward Electronics,**  
422 Bromford Lane,  
Ward End,  
Birmingham B8 2RX

**Waters & Stanton,**  
22 Main Road,  
Hockley,  
Essex,  
SS5 4QS

12 North Street,  
Hornchurch,  
Essex

# SSB Utility Listening

## HF Sideband

A few months back I asked if anybody had any information about maritime 'company frequencies'. A few letters have arrived, but the most comprehensive one is from **Captain Ian McRae** in Scotland who has first-hand experience of such frequencies - he's the captain of a North Sea oil-rig standby-ship.

After the tragic Piper-Alpha disaster, the Cullen enquiry pointed-out the shortcomings of the existing standby vessels, so the fleet has been updated and modernised using converted large stern-trawlers. These spend a month at a time out in the wild North Sea patrolling the oil-rigs and conducting emergency exercises. Ian says that the best place to hear these ships working each other is to listen to the International Distress and Calling frequency of 2.182MHz. The ships will make their initial contact on this frequency, and then QSY to a 'working frequency'; he suggests the following frequencies:

2.049, 2.056, 2.226, 2.231, 2.241, 2.246, 2.301, 2.306, 2.800, 2.900, 3.373, 3.519 (all u.s.b., in MHz)

The ships are owned and operated by a number of different companies that are based in various east-coast ports from Lowestoft to Aberdeen. As well as this normal inter-ship traffic, most of the companies keep a regular schedule between their ships and also between ship and shore station. An example of this is provided by Ian, who says that the ships in his company (all prefixed 'Grampian...', e.g. 'Grampian Star') keep a schedule with their co-ordinating ship at 20.00 hours **local time** (note: not Zulu or GMT time) on 2.306MHz, whereby each ship at sea will call-in and report any problems, equipment defects, etc. The following morning, the co-ordinating ship will put a call through Wick Radio, usually on channel Echo (ships transmit on 2.524MHz, Wick transmits on 2.705MHz), for a radiotelephone call to the company office in Aberdeen. The photo on this page is of the *Grampian Star*, so you know what these vessels look like.

### GCHQ

The May column contained a simple request for some information on a site near Scarborough, known as 'CSOS Irton Moor'. This resulted in a number of letters, many of them anonymous, but all reporting just what goes on there.

This site belongs to the Composite Signals Organisation, which is the intelligence gathering arm of the GCHQ at Cheltenham. Irton Moor is

just one of several locations around the UK dedicated to the monitoring of national and international electronic communications of all kinds, including radio, from v.l.f. to e.h.f. Signals are fed from the sites back to Cheltenham for examination and analysis. The US National Security Agency operates a similar facility at Menwith Hill near Harrogate in North Yorkshire. As one correspondent put it, "I bet their frequency lists are something to behold!"

### Rescue

In the May issue I mentioned the callsigns used by Mountain Rescue Teams ('Alpine', followed by letters or numbers). This prompted two very quick letters from **Ken Dwyer** in North Wales and **Martin Nicholson** in West Sussex; they both provide a cross-reference list between the numeric and alphabetic callsigns, along with the RAF airfields where each MRT is based. Here is their list:

20	Hotel	Stafford
21	Victor	Valley
22	Lima	Leuchars
23	Kilo	Kinloss
24	Tango	Leeming
25	Sierra	St.Athan



Both Martin and Ken say that the numeric callsigns are used when the 'Alpine' unit is communicating with either Plymouth or Edinburgh and the RESCUE helicopters, and they use the alphabetic callsigns when talking to each other or the civilian rescue teams.

Ken also offers a useful hint to those who live in mountain areas, or are keen hill walkers. He says to try listing to 5.680MHz between 0730 and 0830 local-time at the weekend, when Edinburgh transmits a weather report for specific mountain areas. I was a bit surprised when I first read of this, but having now heard it, it really does happen. I heard Edinburgh

passing the weather forecast to Alpine 21, 20 and 95. Does anyone know where Alpine 95 is based?

Ken is a member of one of the civilian rescue teams in North Wales, so he has first-hand experience of actual rescue flights, especially in Wessex helicopters from RAF Valley. Ken, I'm sure you're looking forward to flying in Sea King helicopters, which Valley will be getting in the next few years.

Finally, Ken asks for more military frequencies. I'm happy to oblige, so long as you keep sending me your loggings and listings. My 'supply' is starting to dry-up, so it needs to be replenished with lots of letters!

### Traffic Log (frequency in MHz, all u.s.b. unless indicated)

- 3.023 Rescue 177 working Edinburgh Rescue. 177 was asked to call the local Police on Channel 53.
- 5.245 Stations MRL50 and MRL72 requesting radio-checks. These are Air Training Corps callsigns, does anyone know which unit they are used by?
- 5.687 Various German Air Force aircraft working DHM91/GAF Munster, mostly with departure and arrival times for various airfields in Germany and overseas. A few days later, station DHO23/GAF Landsberg called DHM91 for a radio-check. Klingenfuss lists this as 5.691 MHz, but several stations have called for DHM91 on this frequency.
- 6.535 An unidentified African ATC station working and Air France aircraft in French. Later identified as Dakar Radio when they contacted another aircraft. The latter aircraft was asked to call Dakar on 3.452MHz.
- 6.634 Watchdog 94 working Portishead Radio, requesting a Selcal check. Watchdog 94 is a Dornier 228 patrol aircraft operating in the south-west approaches. It is operated by FR Aviation from Bournemouth/Hurn Airport on behalf of Ministry of Agriculture, Fisheries & Food.
- 6.712 French Air Force 4562 working 'Circus Vert', reporting their departure from Toulouse at 0620Z. Moments later, French Navy 563 called, and reported their departure from Nimes and estimating their destination at 0900Z.
- 6.727 Station JWT calling MAGIC 60 for a radio-check. JWT is listed as the Norwegian Navy at Stavanger, while MAGIC 60 is a NATO E-3 early-warning aircraft.
- 6.728 (l.s.b.) SAM 26000 working Andrews VIP, reporting their arrival at Heathrow Airport. They arranged some pre-flight 'Foxtrot' frequencies for the following day using channels 400upper (primary), 287upper (secondary) and 84upper (backup). I don't have listing for any of these Foxtrot channels.
- 10.780 Cape Radio requesting ships Liberty Star and Freedom Star to change frequency to 3.120. Both ships were preparing for the launch of the Space Shuttle Discovery during early February. Both these ships are used to recover the solid rocket boosters that are dropped from the Space Shuttle during launch.
- 11.170 Cosmos 4 calling Cosmos Control, but their was no reply. Another Cosmos frequency, just like 6.746MHz.
- 11.173 Cricket 22 working LOMBO, reporting that Hammer 45 was currently working with BULLFIGHTER. This is a frequency used by forces involved with the UN in Bosnia. LOMBO is the Air Operations Control Center near Sarajevo, while BULLFIGHTER is a forward air control aircraft.
- 11.176 Station GAWNE (spoken phonetically) calling Mainsail. The operator had an English accent, but their was no reply from any GHFS station. If this really was aircraft G-AWNE, this was a British Airways Boeing 747 Jumbo Jet!

# Airband

## Duxford's DC-3 in D-Day markings.

Chris Mlynek



**H**ow sad to start with an 'obituary'. Hatfield Aerodrome has just closed, the last flight out being a Tiger Moth. Its business jets have been displaced, mainly to Luton. Various attempts to stimulate the market for 146s have not worked: even cheap Taiwanese labour wasn't the answer, nor was renaming it (just because it's now the Avro Regional Jet doesn't turn it into a different aircraft).

Visiting Hatfield some months ago, I thought I could hear the distant sound of the Comet's engines, or was it a Trident on automatic approach in the fog? Was 'Cat's Eyes' Cunningham about to appear out of the gloom, overflying one of the few remaining i.l.s. inner markers (near the 24 threshold)?

No. It's all closed now, its radio frequencies and Air Traffic Zone withdrawn, its skilled workers regarded as scrap - just like an obsolete aircraft. Even the business influence of the JCB company couldn't keep it open. After decades, this important facility has come to a sudden end in the 1990s. Do you think it will ever be re-instated? Is this an achievement to be proud of? Why is it then, that if the economy is at its best ever and the recession is over, we can't afford to retain facilities that were previously regarded as essential? When will we learn that we have had enough controlled destruction, and that now is the time to turn things around and start investing - before it's too late?

### PFA Rally

The Rally returns to Cranfield this year. Runway 04/22 still exists - they built a car plant on the 08 threshold, was this really the only available site in Bedfordshire? You'll just be in time to go to the Rally on receipt of this issue: fly-in day is Friday July 1, with the event proper being on the Saturday and Sunday (flying display Sunday only 1245-1430Z). Chris & I'll be there on the Saturday. They've really tried hard with the arrival procedures this time. Hard runway control is on 122.85, Grass on 123.2, Arrival a.t.i.s. 130.675 and Departure a.t.i.s. 121.875MHz. If flying in, read A/C 33/1994 first.

### Medevac

Photogenic enough to make television appearances, the Helicopter Emergency Medical Service (Dauphin G-HEMS) attracts attention wherever it goes. Based at The London Hospital, Whitechapel, it only operates in daylight and a typical day

would see it out on perhaps three 'jobs'.

Since he works in an office adjacent to the Hospital, **Jerry Hammond** (London) knows all about 'Mike Sierra's' movements. Some time ago it came to visit my local park right here in Edgware and I saw the Captain refer to the locator squares in the *Geographia Greater London Atlas* when co-ordinating his position with the Police and other authorities. Frequencies used (MHz) are Special VFR 119.9, Thames Radar 132.7, DEPCOM 122.95, any nearby local airfield and the ambulance service channels.

Did you know that 'MS even has its own squawk (secondary radar) code? It's 0020 as listed in the UK *Aeronautical Information Publication* (from the CAA) and kindly brought to my attention by **Peter Wade** (Sevenoaks).

### Follow-Ups

Peter helped identify the circular vapour trails (final report: May) and still wonders why the AWACS that made them was on exercise 'near Stansted'. Of course, in three dimensions, it wasn't 'near' Stansted - just overhead! It was far too high to be of any consequence to Stansted's own controlled airspace. It would have been in the London Terminal Manoeuvring Area and hence controlled by LATCC (doubtless by London Mil in co-ordination with the appropriate civil sector).

In keeping with accepted convention, navigational aids are named after the nearest large town or similar place. This applies to the Grantham LATCC repeater, which, as **D.R. Jackson** (Leicester) points out, isn't in Grantham (but it's close). Exact location appears to be 1km NNE Waltham-on-the-Wolds, Leicestershire, along a track leading from the A607. The quarter-mill topo shows various masts here. I listed all repeater sites in the May issue.

As mentioned in that same issue, 121.175MHz was busy controlling helicopters at the Cheltenham Gold Cup race meeting and **Malcolm Bell G6UGW** (Gloucestershire) sent me a photo of the control caravan to prove it.

**Mark Redgwell** (Mitcham) knows where the Lockheed SR-71 Blackbirds are (March); none in the UK! Some aircraft museums in the States have them.

Confusion arises over the way in which frequencies are written. **Pat Bracken** (Glasgow) looked at the April issue and wondered if 133.675 is a new frequency to replace

133.67MHz. In fact they are one and the same! The civil communications airband is presently divided into channels with 25kHz spacing. Dedicated aircraft receivers don't show the final kHz digit, but no confusion arises even if this digit is missed out in official documents or when spoken by controllers. It can only be 0 or 5, depending on the preceding digit. 'Middle' (10s of kHz) digit = 2 or 7; final = 5. Generalised scanning receivers do require the unabbreviated frequency to be selected.

### Information Sources

As this column explains the background to aeronautical radio applications, there just isn't room for long lists of callsigns, spotings, logs and the like. For specialised and detailed information, I refer to the appropriate information source. Last month I explained how *High in the Sky* is a useful book for relating Selcalls to registrations. Now **Roderick McKenzie** (Kings Lynn) suggests another source of information: *Intercept* (the last address for which I had as 9 Heathwell Road, Denton Burn, Newcastle-upon-Tyne NE15 7UP). Roderick has seen serial/callsign and Stud Number lists there.

Now, what about display frequencies? Most are on the aerodrome's established allocations. There are some special cases. Duxford for example, which always controls displays on 134.85MHz. The trouble is, I last published this one in the October '92 issue and I have to strike a balance between being repetitive - and the information last appearing so long ago that we've all forgotten about it. Some displays have a temporary frequency, promulgated shortly beforehand by Class I NOTAM. I can't afford a data terminal to receive these NOTAMs and, in any case, unless at least 6 weeks notice is given, I'd never get the information in print in time. If anyone out there can send these frequencies in good time then please do.

An old problem is again mentioned by Roderick. At a display, many people are heard eavesdropping on u.h.f. and other channels. By accepting this inside the airfield, the display organisers have given a sort of default approval that their frequency can be listened to. A magazine like this one circulates to thousands of people in all kinds of places and there is NO approval for the printing of messages heard whilst listening. Anyway, I'm sure that all

'Airband' readers listen through an earpiece when in public, so as not to disturb others. For example, some people's hobby is to record events on video tape with hand-held TV cameras; they want the aircraft noise, not radio chat, on their sound tracks.

Now that the airband extends up to 137MHz some allocations are being made in the new section. France has had particular need for this, and the *En route* supplements will reflect this when they are updated. Suppliers of these books are listed on Airband Factsheet, an A4 page, which is free on receipt of a stamped reply envelope at the Editorial Office (DON'T send to me, please!). Meanwhile, **Stuart Terry** (Canterbury) knows that Paris is on 136.075 and Brest 136.45MHz. Stuart doesn't say, but I assume, that these are area control centres and not aerodrome frequencies. More changes are on the way and I will report them here when the information comes through. There are even some company operations frequencies above 136MHz. Another report on the French frequencies came from **Alan Page** (Loughborough) who also sent a photo taken in the cockpit of an MD-81 'somewhere between Birmingham and Zurich'. I see that heading was south-easterly, FL330 and doing 310kt indicated. The conventional instruments look remarkably like those of an older DC-9, complete with pretty light-blue instrument panels.

One of the sources in the Factsheet is the RAF, whose *Flight Information Handbook* is most useful. **Tim Christian** (Norfolk) spotted the NAT-F North Atlantic circuit in section 3 of the handbook and sees that it takes over the northern part of NAT-A and the southern piece of NAT-D. Gander will no longer work the NAT-D area. No-one who wants to know about h.f. should be without this handbook!

### Frequency and Operational News

Plenty of new changes in the April GASIL, with thanks to the CAA. At Bristol (Lulsgate) the a.t.i.s. changed to 126.025 (was 121.75MHz). Gloucestershire's a.t.i.s. is now 127.475 (was 121.85MHz). Cranfield no longer has radar, but I'm not yet sure if that means 122.85MHz is now disused. Guernsey now has Ground Movements Control, 121.8MHz at busy times. Truro loses its ATZ, Duxford combines its ATZ with Fowlmere's on 120.925MHz.

Wattisham has been transferred to the Army Air Corps (as previously reported) and **Carl Hender**

(Ipswich) notes that the original frequencies have been retained: Tower 343.425, Approach 291.125 & PAR (Talkdown) 356.175MHz. To clear up Carl's confusion with what Approach does, it would usually provide mandatory radar control for aircraft within the aerodrome's zone.

Traffic outside regulated airspace, but still within the limits of radar cover, can not be given orders by the controller but may ask for a Radar Information (or Advisory) service in order that the controller can help by passing the locations of conflicting traffic.

## Abbreviations

a.t.i.s.	automatic terminal information service
AIC	Aeronautical Information Circular
ATZ	Aerodrome Traffic Zone
AWACS	Airborne Warning And Control System
CAA	Civil Aviation Authority
DC-	Douglas Commercial
E	East
FL	Flight Level
GASIL	General Aviation Safety Information Leaflet
h.f.	high frequency
i.l.s.	instrument landing system
KHz	kilohertz
km	kilometres
kt	knots
LATCC	London Air Traffic Control Centre
MD-	McDonnell-Douglas
MHz	megahertz
Mil	Military
N	north
NOTAM	NOTice to AirMen (includes AirWomen)
PAR	Precision Approach Radar
PFA	Popular Flying Association
Selcal	Selective Calling
u.h.f.	ultra high frequency
VFR	Visual Flight Rules
Z	Zone time (same as UTC/GMT)



North American Sabre being prepared to display at Duxford.

Chris Mlynek

Changing the subject, Carl thinks that air-to-air refuelling is 'difficult and dangerous' and, as I've tried this myself in a simulator, I agree! Only military aircraft do it and then it's over the sea. In general, 'coasting out' refers to crossing the coast and heading out to sea, 'coasting in' being the return direction. Carl wonders if the Red Arrows can refuel in the air; as far as I know, Hawks don't have a refuelling boom (the nose probe is only a Pitot head) but does anyone know different?

Red Arrows: UK displays (with dates in July) are expected at Humberside (3rd), Dover (5th), Shepway (6th), Portsmouth (7th), Chicksands (9th), Silverstone (10th), Llandudno (15th), Abingdon &

Yeovilton (16th), Church Fenton & Leicester & Pontefract (17th), Ayr (21st), Porthcawl (22nd), Manston (24th), Lyme Regis (26th), Culdrose & Peterhead (27th) and Leeming (30th). As there is always the possibility of last-minute changes, it's worth ringing the Royal Flights & Restricted Airspace free recorded message (0500) 354802.

The next three deadlines (for topical information) are July 15, August 5 and September 16. Replies always appear in this column and it is regretted that no direct correspondence is possible. Genuinely urgent information/enquiries: 081-958 5113 (before 21:30 local please).

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73 from Dave G4KQH, Technical Manager.

# Scanning

Following in someone else's footsteps is often a daunting - if not awesome - task - so spare me some sympathetic thoughts as Alan Gardner's successor! Alan has, unfortunately, had to give up the column due to pressure of work and I hope that, with your help, I'll maintain the extremely high standards Alan's time in the chair has brought 'Scanning'.

A new hand at the helm is not always a bad thing. I don't, for example, intend changing direction hugely. I will, however, try to take aboard issues that have been raised to me by scanner owners here in my locality - and there are quite a few! It's also not my intention to drift off course so regular readers of this section can sleep soundly in their beds on that one!

Obviously, there may be some alterations but I think that's a fact of life. I do promise, however, not to undermine the very strong base that Alan has built up over the years, which make this column the premier one of its kind anywhere.

I'll use this opportunity to go into my own areas and the sort of equipment I use, which will give you a good idea of what it is I enjoy. I'll also put in some further thoughts on things I would like to see covered - and I'm sure that you will write in with ideas of your own! On that subject, if you've written to Alan and have not yet had a reply, then don't worry! The mail is currently being redirected between Alan and myself and this takes time to sort out. If you're not in, don't fret! You'll get through when we're sorted.

Equipment here is used to cover my particular areas of the hobby which are, in the main, Search and Rescue (SAR) Communications plus Civil/Military Air and Marine. I also still dabble down in the crepitating ether of h.f. - again, much of it SAR and Marine - with some very slight Band II f.m. thrown in for light entertainment!

For Civil/Military Air and Marine v.h.f., I use a Yupiteru VT-225, which I find is an excellent bit of kit. It is either coupled to a Scanmaster Base for 'DX' work, or goes mobile on its own flexi-whip. Most of the frequencies in here are SAR related.

General scanning is covered by an AOR AR-2000, and again I change the antenna about to increase coverage when the Marine/Air bands are quiet. I find the memory capacity of this machine to be way beyond my horizons - does anyone out there have the 1000 channels filled with active frequencies?

For v.h.f. lo-band work, I used the rugged Sony ICF-PRO 80 on an AD-370. I've had this antenna for nearly

ten years and, apart from the yearly maintenance on it, it has proved to be a most versatile and weatherproof antenna. Looking after your antenna will be something I hope to cover at a later date. I don't see how many people can put up and forget anything as important as an antenna which, when you look at objectively, is equally as important as the set. One needs the other and it makes sense to look after both.

High Frequency bands are covered by a Sangean ATS-803A with an a.t.u. to a long wire and ex-CB vertical rework for short wave. Band II v.h.f. is taken in by a Sony ICF-5500M 'Captain 55' on its own built-in whip and I have found this little set to be extremely sensitive for the band outperforming the ATS-803A and even the PRO80! I have no details about the set itself as it was given to me by a friend who had no further use of it. Tuning is by a film-type scale with marks on the Perspex scale cover indicating frequency. It has a 'local and DX' switch, covers short wave 'marine band' without any s.s.b. and has a timer built-in - clockwork type - on the top panel. I would say it was marketed in the early 70s, or maybe even earlier. Anyone any ideas?

## Search and Rescue

Search and Rescue interests are more than just a part of my scanning - as a crew member of the Trearddur Bay Lifeboat, you could say that I have vested an interest in the whole thing! I'm not the only one either, as nearly all the crew have scanners - monitoring them as a sort of pre-empt to the pager alarm or maroons going up! I also know other stations have scanner owners, with some stations also having a scanner fitted into the crew room! Obviously, if a situation is developing then, with some local knowledge, the crew can determine if there will be a 'shout'. Not sanctioned by the RNLI, by the way, but a versatile early warning system nonetheless.

I believe that many more of the Emergency Services personnel carry out very much the same thing here in the UK. Does this go on elsewhere, outside of this country? If you live abroad and know it does, then please drop me a line with what you know and I'll feature it. It would be nice to know that the use of scanners can serve a more useful purpose than the

very low one it is rumoured to have by some elements.

Now, a warning to potential purchasers of scanners. A colleague of mine, keen to get a scanner and unable to wait for one, purchased what was sold as a brand new top-of-the-range one through what I would consider was a very dubious outlet.

Pointed in the direction of a vendor by a 'friend', this person duly bought, for cash, a scanner which - after only a short while - failed to hold a charge on its NiCads or run from the supplied p.s.u. I charged the batteries for him myself and tried the set on one of power packs - to no avail. The batteries were fine, but the set would not power up. Closer examination showed the pin in the power socket to be badly bent. He duly took the set back and was told it would be repaired. A few days later he picked it up - to discover exactly the same thing was taking place! He then took the set back and asked for his money back, which - as you can imagine - he did not get. Why? No Bill of Sale had changed hands, the dealer was selling nearly new and **not** new stuff and my young friend had no proof he bought the set there. What's more, he was accused of having bent the charge plug himself - not so, as the first person he came to see to get the set-up was myself!

I have now told him to try the local Trading Standards Office for advice. I think he'll have a hard time proving his case, but maybe the visit by a Trading Standards Officer will deter the would-be radio entrepreneur for a while. Other sources say that the VAT Office should be informed.....

## Service

I cannot for the life of me see why people buy from so-called 'known' sources. Something as expensive as a scanner should be bought from a source established in the radio market place and giving a good guarantee of good service plus back-up. After all, it is money you have earned or saved - and throwing it away like that doesn't

make sense! I use a recognised dealer with whom I have a quality service, delivery at the speed of light and who never tries to talk me into what I don't want. He has a big reputation - and trades on it - and is always friendly. The fact that he lives on the other side of the country to me is nothing. My AR-2000 was ordered on a Wednesday at just after 4pm. It was in my shack at 9am on Saturday morning - with a fully charged set of NiCads in the back too! A thank you to Martin Lynch for that, once more, brilliant service! Before any of the other reputable dealers take umbrage at Martin being singled out I have no doubt that you would get an equally good service from them, as well.

If you are looking for a first time purchase, a second radio or just want advice - then take a look at the pages of the magazine in your hands and ring around! You know that all of the dealers in the magazine are known, some having been around for years, and they have a reputation to maintain. You, the customer, are very important to them. Why risk your cash elsewhere?

On that note, it's time to call it a day. By the time the next issue of *Short Wave Magazine* is out I hope we will be 'back to square one' as it were. As I said earlier, if you have written to Alan Gardner and are disappointed by the non-sighting of your name and question/reply - don't be discouraged! The mail between Alan and myself didn't reach here before the deadline for this first piece. By next month we will be overflowing with it, no doubt!

If you have any queries or ideas you'd like to see - start now and get writing! I'd welcome your views wherever you are in the world on any alterations/plans/notes or what have you for this column. I'd be more than happy to feature them.

In the meantime, I hope that next month will prove to be closer to the principles of scanning - which saves me having to think about what I should say next!

Until next month, good listening.

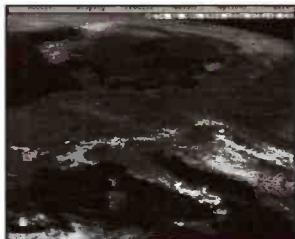


John Griffiths is a crew member of the Trearddur Bay Lifeboat, similar to this one.



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# Info In Orbit

The latest information on METEOSAT encryption is published this month. I have received a large number of pictures kindly offered for inclusion in the column. Many are of high quality and I am invariably at a loss to know which to postpone! If you have submitted a picture which has not appeared, be assured that it is purely a matter of space.

## Current WXSATs

If you are a beginner to the hobby of monitoring WXSAT operations, it might seem quite bewildering reading about which satellites are operating. Knowing how to identify them when they come over your horizon, transmitting signals not heard for some months, might seem all but impossible. However, experience with satellite predictions programs, together with keeping your own records of Russian (CIS - Commonwealth of Independent States) WXSATs can be invaluable.

There are two categories of operational METEOR WXSATs - series two and three. Yes, there was a series one, but those satellites were classed as experimental, and were discontinued some years ago. I still have tape recordings of several METEOR 1-30 passes that are decodable using current software. Their image quality (even from the recordings) was excellent.

Those in the series two group (such as 2-19, 2-20 and 2-21) pass over a given location (such as Britain) some 18 minutes later each day. Contrastingly, those in the series three group (3-4, 3-5 and 3-6) pass over the same location some 18 minutes earlier each day. You can check this out by running a predictions program and listing pass times for a few consecutive days.

The orbits of each group will be seen to move progressively during the course of a week. This means that they are not sun-synchronous. Consequently they are always moving towards a terminator (day-night boundary). Eventually they catch up with it and, depending on the season, operating CIS WXSATs may be heard to switch off. Experience tells us that most (if not all) of these WXSATs do not transmit during their night-time.

METEOR 3-5 has been operational in sunlight on 137.85MHz for several weeks. It remained transmitting during its recent approach to the morning terminator, at least up to mid May! I had expected that it would be switched off because at this time, near the terminator, its solar panels are receiving illumination at a low

angle and it could be under some power constraint. However, it remained on during the mornings passes.

Within a few days we heard it switch on as it approached the north pole during late afternoon ascending passes (Europe in darkness). I logged this event at 1945UTC on May 5. Gradually the evening passes came to dominate as we lost the morning passes into the terminator.

METEOR 2-21 came back into operation on 137.40MHz around May 5, a transmission reported by **Jim Richardson** of Strathkinness (Fife). Looking at METEOR 2-21's orbit (with respect to sunlight) showed that it was operating under nearly full illumination. It continues to transmit poor signal strength. One theory that might explain this, points out that it was put into orbit simultaneously with TEMISAT (which transmits non-a.p.t. on 137.72MHz) and might have suffered from antenna misalignment during separation in orbit.

Across in the NOAA camp, NOAA-9 returned to normal operations on 137.62MHz during April. This followed its temporary clash with NOAA-11 passes. NOAA-10 also came back on (137.50MHz) after its short clash with NOAA-12, so we then had a long run with all four NOAA WXSATs transmitting. Officially NOAA 9 and 10 are backup WXSATs, pending replacement by future NOOAs.

Some months ago I distributed the 'Learn Orbits' software (see February edition) that included self-teaching programs of high quality. One is used for test-running sample orbital elements. These programs seem to have been well received. They can be used to show exactly how the different METEOR orbits precess relative to the sun, and can therefore help in visualising changing sun angles, as experienced by the METEOR WXSATs during a period of several months.

## METEOSAT Encryption Update

As has been mentioned in previous months, METEOSAT Primary Data (PDUS) is due to be substantially encrypted in due course. Fortunately no changes to WEFA users (SDUS) will be made for several years.

Discussions between EUMETSAT's 17 member states are ongoing, but a letter from Henk Verschuur, the MOP Technical Officer comments that full encryption is unlikely before late 1995, and he adds "It might be possible that several image products remain unencrypted...". This appears to be a favourable change to the original plan.



Fig. 1: NOAA 11 image of UK from Dr Tony Batchelor.

## PDUS Encryption

Modifications to current PDUS systems will take two forms. The first part involves the implementation of a decryption unit interface between the frame and bit synchroniser. This part will probably be required to be supplied by the PDUS manufacturer. Alternatively, it might be possible to provide this by a modification to the software.

The second change required is the purchase of a METEOSAT Key Unit (MKU) from EUMETSAT, which might be bought in the framework of a licence agreement with the UK Met Office. Further information should be available from July.

## No NOAA Encryption

NOAA's position is not to encrypt data. The European community has been strongly encouraged not to encrypt its WXSAT data. There are agreements between governments to exchange such data, which means that the US has the right to distribute unencrypted European data within America!

## Re-organisation of NOAA WXSATS

For many years America has operated two types of low earth-orbiting WXSATs - the civilian programme run by NOAA, in which NOOAs 9, 10, 11 and 12 transmit a.p.t. telemetry - and a military program using a similar type of satellite, but which uses encrypted telemetry.

The US Department of Defense is responsible for the Defense Meteorological Satellite Program (DMSP). The mission of DMSP is to collect and distribute global, visible and infrared cloud data and other specialised meteorological, oceanographic and solar geophysical data to provide a survivable capability in support of military operations.

On May 5, President Clinton approved the convergence of these

two separate programmes. Plans have been proposed to operate a new fleet incorporating three satellites in low earth orbit. At present there are two civilian WXSATs (NOOAs 11 and 12 - not counting the two backup WXSATs), and two military satellites. The three satellites in the converged programme will be evenly spaced, eg., may have equator crossing times at about 0530, 0930 and 1330 local time.

EUMETSAT has been invited to consider participating in the new programme. My thanks to **Paul Wilson** of Macclesfield for providing me with this NOAA/DOD information.

## GOES

Following a successful launch in April, the GOES-8 (Geostationary Operational Environmental Satellite) spacecraft is doing well. Rocket manoeuvres and deployment of the solar panels were completed successfully, and the imager was exercised. The first official GOES-8 image came after outgassing and communications switch-ons were completed.

GOES-8 is a new spacecraft with a complex ground system. It is almost a generation ahead of present GOES craft, having much better image resolution. Visible imagery will have 10-bit resolution and infra-red resolution will be twice as high as current images. There is a separate sounder for ozone monitoring. The craft has 3-axis stabilisation so image scanning limits are set by ground control. This means that they will obtain one full disc image each hour.

Its orbit was finally circularised on April 27 at which time its name changed from GOES-I to GOES-8. The unfurling of the solar array was completed on April 28, followed by deployment of the magnetometer boom. On April 29 the spacecraft was allowed to tumble, allowing the magnetometer to obtain the characteristics of the craft's magnetic field.

On April 30 solar sail deployment was completed; this means that the spacecraft is well balanced about its centre of gravity against torques from the solar wind. In early May the imager's scan mirror was exercised to produce some lines of visible imagery. Tests will continue for some months, and GOES-8 is expected to replace METEOSAT-3 during October at 75° longitude (over the eastern seaboard of the USA). GOES-9 is scheduled for launch in April 1995. My thanks to NOAA for providing the details of the GOES launch.

## Current Geostationary Locations

As of early May, the position of WXSATs along the Clarke belt - all using 1691MHz - are as follows:

METEOSAT-5 (MOP-2) is the operational European WXSAT positioned at 0° longitude.

METEOSAT-4 (MOP-1) is the current European backup WXSAT; located at 8°W (not normally transmitting).

METEOSAT-6 (MOP-3) is undergoing tests on the anomaly in its infra-red transmissions; located at 10°W.

METEOSAT-3 is positioned at 74°W, on loan to the USA. It will move to 70°W as back-up after GOES-8 becomes operational.

GOES-8 is positioned at 90°W under test.

GOES-6 is positioned at 105°W.  
GOES-7 is the Prime American WXSAT, positioned at 112°W (in the 'East' position).

GOES-2 is the 'Western' WXSAT, positioned at 134°W.

## FENGYUN 2A

Just before press time for 'Info' I heard that FENGYUN 2A had blown up during its testing phase. This is a very sad event which may have claimed some lives. In the western world, most satellite projects involve the building of a flight spare alongside the flight model, that latter being the one that actually goes into orbit. Flight spares were built for the ARIEL satellites with which I was involved as a controller.

I don't know whether there was such a spare for FENGYUN. The benefits of building a flight spare are numerous; if a fault develops in orbit, simulated events can be tested on the ground model, which can even be subsequently launched.

The Australian Bureau of Meteorology (BOM) was working with the China Meteorological Administration (CMA) on the FENGYUN 2A (FY-2A) satellite to provide a Turn Around Ranging Station (TARS) to support FY-2A operations as it currently does for the Japanese GMS satellite.

FY-2A would be similar in performance to GMS, being fitted with high resolution imaging systems to



**Fig. 2: NOAA 9 image of Canaries from Mike Smith.**

provide image data, with resolutions of 5km in the infra-red, 5km in the water vapour band, and 1.25km in the visible. Low resolution WEFAX (analog), DCP capability, and a new digital S-band FAX service (CCITT G3) are to be included for the domestic distribution of charts and imagery.

Compared to the two FENGYUN-1 satellites launched in 1988 and 1990, the new-generation meteorological satellite FENGYUN-2 reportedly represents a breakthrough in terms of

technical performance, scope of application and service life. The satellite design employs a number of advanced technologies, such as scanning radiometry, slender-body control technology and apogee engine separation, marking the first time such technologies have been used domestically and signalling a new stage in their country's space technology.

FY-2A downlink characteristics include:

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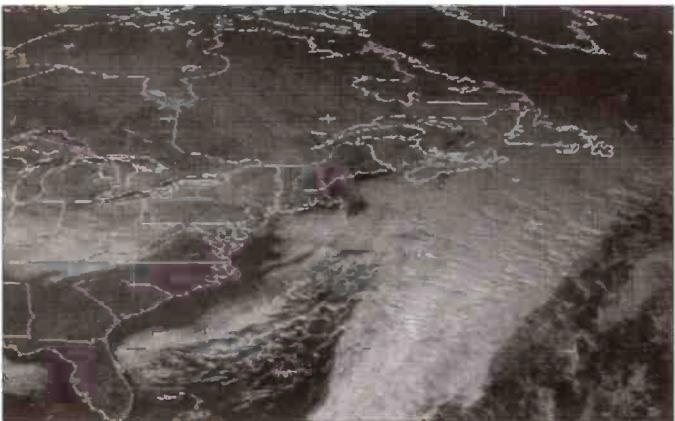
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**Fig. 3: METEOSAT-3 re-transmission from David Simpson.**

Channel	Frequency	Bandwidth
S.VISSR	1687.5 MHz	2MHz
LR-FAX	1691.0 MHz	260kHz
S-FAX	1699.5 MHz	26kHz

This information has been provided by both the BBC and **Mike Kenny** of Satellite Engineering, Bureau of Meteorology, in Australia.

### Letters and pictures

**Dr Tony Bachelor** of Falmouth sent some large format pictures obtained by his equipment and printed on a high resolution laser printer. The picture in **Fig. 1** is from NOAA 11 during June 1993 and shows a clear Britain (I don't remember that day!). The reflection of the sun in the Atlantic ocean was recorded. All of the islands in the western Mediterranean sea are clearly seen, and thunderstorms off the north-western coast of Spain. Tony comments on local QRM (radio interference) on 138.3MHz that affects METEOSAT signals. That is probably a pager frequency. Tony has also noted an interfering signal on 137.58MHz that he says affects NOAAs 9 and 11 on 137.62MHz. The British satellite X3 (PROSPERO) transmits on 137.56MHz so could be involved. It is normally of low power.

**Mike Smith** of Sherborne obtained an exceptional image from NOAA 9 on February 20 this year, **Fig. 2** shows the Canary Islands off the coast of west Africa in this visible-light image. Mike was surprised at the conditions that could allow reception of such a clear signal. We do not normally receive much of a signal from NOAA WXSATs over this part of west Africa. Mike used PROsatll and obtained a BMP format image, then imported it into PagePlus and printed it 20% lighter than normal on his Deskjet 500. His original image is quite remarkable.

**David Simpson** sent some printouts obtained from METEOSAT. They include images from the GOES 'east' position (currently occupied by METEOSAT-3), and from the Japanese GMS-4 WXSAT slots, currently being re-transmitted by METEOSAT-5. The picture in Fig. 3 is a visible-light image from METEOSAT-3, from the series transmitted by METEOSAT-5 at 1330UTC. At this time the area is near sunrise so

illumination is low, but the cloud front off the east coast, being high above the ground, shows up quite well. The state of Florida also shows well against the dark Atlantic. State outlines are added by ground controllers as an aid to position identification. For those who prefer a more realistic image (without the outlines), software often incorporates a filter which can remove the sudden transition to white. The resultant image can be very effective, but sometimes undesirable effects can occur, depending on the amount of white present in the image - it all adds to the fascination of image processing!

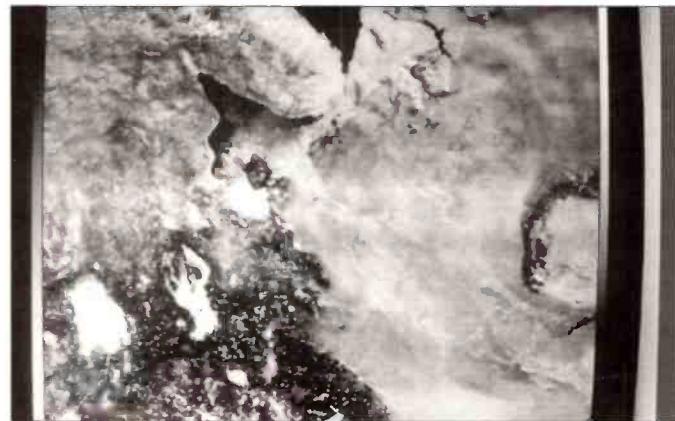
Jim and **Hilda Richardson** of Fife (Jim was mentioned earlier) purchased the TH2SAT package that I reviewed last year. They comment that they are impressed with it, particularly the 'quick save' feature. They have used screen photography with 200ASA colour film to produce several prints, from which I have selected **Fig. 4**. This is from METEOR 3-5 passing over the Kola Peninsula earlier this year. The extensive ice cover on the White Sea can be clearly seen.

### TBUS information

Some readers may monitor h.f. transmissions from Bracknell and receive TBUS data. **Brian Barber** of Fleet points out that Bracknell's 4.487MHz transmission (u.s.b.), includes regular TBUS data. This is a form of satellite predictions information, broadcast on h.f. and also disseminated via computer BBS. It is issued for each NOAA WXSAT, in four parts. There are two types; TBUS-1 for daylight descending WXSATs (eg NOAA 10), and TBUS-2 for daylight ascending WXSATs (eg NOAA-11).

Section four contains high precision orbital data, orbit number, inclination and all the usual parameters, including extra data for those computer programs that use alternative algorithms.

One can calculate satellite positions using different methods; intriguingly, they rarely produce identical results! This is because some parameters make assumptions not made by others; for example some algorithms disregard the effects of atmospheric drag on the satellite.



**Fig. 4: METEOR 3-5. Kola Peninsula. Jim and Hilda Richardson.**

Other algorithms use drag parameters which might be inaccurate! Discrepancies are normally minimal. Detailed descriptions of TBUS elements are given in the Klingenfuss manual and elsewhere.

**Andy Cawthorne** wrote from Hong Kong where he is doing a tour. He regularly listens to MIR and the US Shuttles and monitors Tokyo Met to receive their h.f. transmissions of GMS WXSAT imagery. He explains that the (original) GMS images are very good for monitoring tropical storms and typhoons. For those not familiar with GMS, it is the Japanese equivalent of METEOSAT-5. GMS images are transmitted by METEOSAT several times per day on channel two - 1694.5MHz, though these are of reduced quality due to time transmission restraints.

### Product Reviews

I wish I had some positive news for this spot! Despite three requests, I have still not received a review copy of recently issued METEOSAT colour animation software - hence no review. Another company provided hardware that proved unsatisfactory.

### More Software!

I am currently examining some satellite predictions programs which I have received from readers and other sources. I hope to make one or more available from next month, after deciding which seems the most suitable for general use. I suspect that this will be a most welcome opportunity for new readers of this column.

### Special Edition

Later this summer I will be producing a special feature on WXSAT hardware and software, when I have consolidated all of the information recently requested from various companies.

### Kepler Elements

I will send a print-out of the latest WXSAT elements upon receiving an s.a.e. and separate, extra stamp. All WXSATs plus MIR are included, together with transmission frequencies if operating. This data originates from NASA. Alternatively, because I already send monthly Kepler print-outs to many people, you can join the list and save some postage by sending a 'subscription' of £1 (plus four self-addressed, stamped envelopes) for four editions, sent at monthly intervals.

A massive 600Kb file containing recent elements for thousands of satellites is regularly issued by NASA. I now provide a version of this, split into smaller sections, from which separate satellite groupings are extracted. A print-out identifying NASA catalogue numbers (for the WXSATs, Amateur Radio satellites, and others of general interest), in both launch and object format - is included. This option is constantly being improved. Please enclose cash, a cheque, or PO for £3 with your PC-formatted disk and s.a.e. Further suggestions for improvement will be welcomed. This is essentially a non-profit-making offer.

### Frequencies

NOAAs 9, 11 a.p.t. on 137.62MHz; NOAAs 10, 12 on 137.50MHz; NOAA beacons on 136.77 and 137.77MHz; METEOR 2-21 on 137.40MHz and METEOR 3-5 on 137.85MHz.

### Abbreviations

a.p.t.	automatic picture transmission
AVHRR	Advanced Very High Resolution Radiometer
BBS	Bulletin board service
DOS	Disc Operating System
EMS	Expanded (or extended) memory
ESA	European Space Agency
EUMETSAT	European Organisation for the exploitation of Meteorological Satellites
GOES	Geostationary Operational Environmental Satellite
GOMS	Geostationary Operational Meteorological Satellite
h.r.p.t.	high resolution picture transmission
NASA	National Aeronautics and Space

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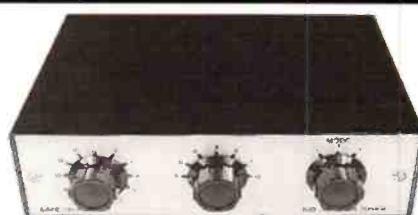
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# Decode All the Data Modes

If you are attending the UK Hamfest at Stafford on July 2/3, then pop round to the SWM stand and say hello. I shall be running a Decode Clinic from the stand. I'm not quite sure what form this will take yet, but I shall have copies of the various lists and programs available as well as as much advice as I can muster for you. I look forward to seeing you all.

## Readers' Letters

**Ray Howgego** from Caterham uses both JVFAK and PC GOES/WEFAX and wants some help with the interface. Whilst he accepts that PC GOES/WEFAX has the edge in terms of ease of set-up and general operation, he wants to use its decoder with JVFAK. Short wave f.m. signals are no problem, it's the a.m. satellite based systems he's having a problem with. Does anyone out there know how to access the PC GOES a.m. port for use by other programs such as JVFAK. Please drop me a line if you can help.

**Mark Atherton** of Solihull, has recently started reading the column but being an ex-maritime radio officer he has lots of radio experience. He recalls using an old Japanese FAX receiver built by Koden. This had pre-tuned crystal packs that were plugged into the front panel. The FAX image was

Clevedon appears to have found the answer and reports that it's a Russian variant of the British Piccolo or French Coquelet multi-tone system. **Bill Jeffs** of Wimborne also wrote in pointing out that it looked very similar to the Piccolo system.

Incidentally, for those that haven't come across Piccolo it was an ingenious system that used tone combinations to represent letters of the alphabet. The nearest modern equivalent is the two tone system used to represent digits in modern telephone systems. The Piccolo was originally developed for the diplomatic service to provide error free reception in noisy city centre locations. However, the most famous use of the system was when it was used to transmit daily news reports to the QE2!

## Complex Modes

**Geoff Crowley** of Aberdeen is a regular contributor and poses a frequently asked question - Is it worth upgrading to what's become known as the complex modes? Most of the popular decoding systems on the market have been developed to handle the more common modes such as FEC, ARQ, RTTY, c.w. and FAX, but there are a wide range of less common systems in use. It is these latter systems that tend to be referred to as the complex modes. Typical examples being ARQ-E, ARQ-E3, FEC A, TDM342, TDM242, TORQ, RUM-FEC plus many more. In order to receive these modes you will most likely have to make a significant upgrade to your decoding equipment and move to top-of-the-range systems like those from Universal, Wavecom and Hoka.

So is it worth it? Well, in terms of volume of plain text transmissions I doubt it as many of the more complex systems either spend long periods idling or use off-line encryption for the traffic. The end result is that you can synchronise to the station but are unable to receive any text. There are a few exceptions to this, particularly in the aeronautical field. For many listeners, myself included, the fascination lies more with the detective work involved in a positive identification of the station and mode. This is where the more complex decoders come into their own as most feature some form of



"Dennis Heaton - a lifetime of listening". On the left in his 1947 shack, while below in his present one.



diagnostic pack that can be employed to analyse data signals. By using these tools you can learn a lot about data transmission and the variety of systems to be found on the h.f. bands. So as

long as you don't expect to reel-in lots of new information and view the upgrade as an educational move, then it's worth doing.

As a final aside on this issue, **Robert Hall** of South Africa has just sent me an analysis of his loggings over a two year period 92/3. This helps illustrate how the various modes are utilised once you have a top-end decoder Robert uses the Universal M-7000.

Mode	Logs	Mode	Logs
RTTY	697	SITOR A	193
ARQ-E3	116	FAX	76
CW	74	ARQ-M2	72
ARQ-E	67	SITOR B	54
PACKET	44	USB	44
SWED ARQ	28	FEC-A	13
VFT	7	FEC-S	1

The abundance of ARQ-E3 is primarily due to his monitoring the French Forces h.f. comms network. Although only really relevant to South Africa, Robert reports that the highest density of utility transmissions occurs at between 1800 and 2200UTC.

## Amiga Software

**Andrew Westmorland** of Wakefield has written in response to my request for help with software for the Amiga range of computers. Andrew has been using 17 Bit Software of Wakefield and reports some good public domain software. For more details please contact 17 Bit direct on (0924) 366982 or write to 17 Bit Software, 1st Floor Offices, 2/8 Market Street, Wakefield, West Yorkshire WF1 1DH. My thanks to Andrew for taking the trouble to write.

## Beat This!

**Dennis Heaton** from Bradford has sent me some fascinating photographs showing how his shack has developed since 1947. The first

shot shows him reading SWM whilst listening to his home-brew fourteen valve, double superhet receiver. In fact, Dennis has been a keen listener since 1934 and an avid reader of SWM since 1939. In the second picture not only has Dennis grown more handsome (!) but his shack has expanded considerably. Current receivers are a NRD-525 and Drake R7A, which in turn drive a selection of decoding systems. These include the Universal M-7000, FAX-1 and Telereader 670E. In addition he runs a 386SX computer. The antennas comprise a TH3 Mk3 at 40ft plus a 22m long wire which with his house being 300m a.s.l. makes for a very effective set-up. Just to prove the point Dennis has sent me a selection of top quality FAX charts that he's received over recent months. If you can beat this for continuous listening why not drop me a line with a few details and a photo or two.

## Momentum Update

I have one or two corrections to add following my review of the MCL-1100 Starter Pack in the May issue.

The optional TV modulator is no longer available following the introduction of the starter pack with its own monitor. This is probably a good move as TVs generally make poor monitors. Bob Taylor of Momentum has also promised to improve the documentation with the next release.

## USCG Boston (NMF/NIK)

Following a recent QSL with this station, **Chris Durkin** of Ormskirk has sent me a copy of a fact sheet about this important US Coast Guard station.

The station fulfills a number of key roles including long range ship-to-shore and air-to-air communications for command, control and co-ordination of coast guard operations within the Arctic,

N O R T H W O O D F A	
<b>SCHEDULE OF TRANSMISSIONS</b>	
0300	Schedule
0320	00Z Surface Analysis
0400	18Z Sig Su Wind & Wx Prog
0440	Satellite Pictures
0540	00Z Selected Upper Air Ascents
0600	Repeat 0320
0620	NAC TAFS
0730	Repeat 0400
0750	Combined 0 & 2 Deg C 12Z Anal
0825	Gale Summary
0950	00Z Surface Analysis
1040	Satellite Pictures
1130	Gale Summary
1155	00Z Sig Su Wind & Wx Prog
<b>ALL TIMES ZULU</b>	
1210	Report 0950
1230	00Z Sea & Sweet Prod
1300	Sea Surface Temp Analysis
1330	Satellite Pictures
1425	NAC TAF S
1500	12Z Surface Analysis
1640	Schedule
1650	12Z Selected Upper Air Ascents
1730	Satellite Pictures
1930	Gale Summary
1950	Repeat 1500
2005	Repeat 1150
2050	Report 1230
<b>NOTE:</b> ALL FREQUENCIES ARE CONTINUOUS	

## Northwood schedule received by Les Crossman.

produced by three needles that attached to a turntable. This rotated and as the needles passed over the electrically conductive paper the image was gradually built-up. Does anyone out there have any more details or even a few photos? If so please drop me a line.

## Mystery Signal Identified

In the April Decode I printed a request for help from Dr Martin van Duinen of Holland. He had spotted a mystery multi-tone station on 12.101 and 14.397MHz and asked if it could be identified. **Day Watson** of

## USCG Boston (NMF-NIK) Schedule

North Atlantic and Caribbean area. These communications are by secure RTTY systems. This prime role is supplemented by a number of other services such as weather information, NAVTEX and Ice patrols. This latter service having been set-up following the tragic sinking of the RMS *Titanic* in 1912.

The main station is located on a 57 acre site about 55km south of Boston in Marshfield Massachusetts. The transmitter site covers about 542 acres within the Massachusetts Military Reservation on Cape Cod. All this is supplemented by an unmanned microwave site at Manomet with the whole network interconnected using landlines and microwave links.

The Boston main site uses 30 Harris R-2368/URR I.f./m.f./h.f. receivers that are connected to an omni-directional Hermes aperiodic loop array.

At the transmitter site there are 12 state-of-the-art Collins HF-80 10kW transmitters plus two Nautel NX2500 TT/6 m.f. transmitters.

This impressive set-up can be patched to an amazing range of 18 antennas that comprise 10 fixed log periodics, four omni-directional horizontal log periodics, 1 omni-directional vertical h.f. cone, 2 omni-directional horizontal flat-tops (m.f.) and 1 omni-directional vertical dipole!!

As you can imagine, both sites are manned around the clock and employ a total of 68 people. If you'd like to contact this station the QSL address is USCG, Communication Station Boston, Marshfield, Massachusetts 02050, USA.

Just to complete the picture, you should find the latest Boston Schedule in the column. Thanks to Chris for supplying this information.

## JVFAX Bits & Pieces

With so many readers having taken up JVFAK (around 900 so far) I've received an assortment of queries/suggestions that warrant an airing. The first concerns the use of JVFAK with PC emulation programs - it won't work! Over the years there have been a number of attempts to write emulation programs that make other computers like the Sinclair QL behave like an IBM PC. Whilst some of these do enable common business application to run successfully they don't work with most comms programs like JVFAK and HAMCOM. This is because comms programs generally use non-standard routines to work directly with the system hardware, but emulators work with standard basic input and output routines (BIOS).

My second point will be of interest to anyone building the complex interface that's detailed in the GIF files. Many people have had some difficulty finding a supplier of the analogue to digital interface chip (LTC1099). **John Collins** of Bristol reports that they are available in one-off quantities from ANZAC, 822 Yeovil Road, Slough Trading Estate, Slough SL1 4JA. Tel: (0628) 604411. If you live in the Bristol area and have managed to get a complex

Time	Type	Mode	Frequencies
0030	SITOR ICE Broadcast	f.s.k.	6.3123, 8.4148, 12.577.3
0045	NAVTEX Marine info	f.s.k.	518kHz
0050	International Ice Patrol	c.w.	5.32, 8.502, 12.75
0140	SITOR Broadcast	f.s.k.	6.3123, 8.4148, 12.577.3
0300	National weather FAX wave & wind charts for NE US	u.s.b.	3.2401
0440	Marine Info B/cast - weather, nav warnings & distress	u.s.b.	2.67
0445	NAVTEX as above	f.s.k.	518kHz
0800	National weather FAX as above	u.s.b.	3.2401
0845	NAVTEX info as above	f.s.k.	518kHz
0905	National weather FAX as above	u.s.b.	3.2401
1040	Marine info as above	u.s.b.	2.67
1218	SITOR ICE Broadcast	f.s.k.	8.4148, 12.577.3
1245	NAVTEX	f.s.k.	518kHz
1250	International Ice report	c.w.	8.502, 12.75
1350	Notice to fishermen	c.w.	8.502
1600	FAX Ice Charts	u.s.b.	8.5001, 12.7581
1630	SITOR marine info	u.s.b.	8.4148, 12.577.3, 16.8048
1640	Voice marine info	u.s.b.	2.67
1645	NAVTEX marine info	f.s.k.	518kHz
1730	Weather FAX	u.s.b.	7.5281
1810	International Ice Patrol FAX	u.s.b.	8.5001, 12.7481
1835	Weather FAX	u.s.b.	7.5281
2015	Weather FAX	u.s.b.	7.5281
2045	NAVTEX	f.s.k.	518kHz
2240	Voice Marine info	u.s.b.	2.67

Unless otherwise stated all times are UTC and frequencies MHz.

interface to work perhaps you could help John as he's having a few problems.

Finally, I'm looking for some information from you. Whilst JVFAK works best on a 386 based machine or better, I know some of you are using it with some of the older processors. If you've managed to run this successfully could you drop me a line with details of the system settings that you used to overcome the speed problems.

Coming soon will be a few hints on using the SSTV options plus some guidance for the date driven FAX reception. If you need any help with JVFAK, HAMCOM or PKTMON please write to the address at the head of the column. Whilst I can't always answer personally I can respond via the column.

## PKTMON12

Those of you who have already sent for your copy of HAMCOM will have noted the inclusion of an extra goodie in the form of PKTMON12. This was included on the original disk supplied by HAMCOM author Wilhelm Schroeder so has been copied with his program. I'll put together a more complete review in a future Decode, but in the meantime here are a few snippets to wet your

appetite.

The program has been designed to provide a simple method of receiving standard packet signals. It also operates using the same interface as HAMCOM and JVFAK so if you have those running you should be able to use PKTMON. The only limitation is likely to be the speed of your PC as this program demands a lot of processor time. It is likely that a 20MHz 386SX is the minimum it will run with - if you discover differently I'll be pleased to hear from you.

The user interface to PKTMON is also a little more basic than JVFAK or HAMCOM and you are faced with five questions to answer before the program starts. These let you set the COM port, receive mode and options for handling the received information. One of the things that sets PKMON apart from many other Packet programs is its ability to filter signals into log files. If you've ever tried to monitor a Packet station you will have been frustrated by the difficulty of extracting the required station from all the other stations using the same frequency. PKMON handles this problem by sorting the received data into separate log files for each station. You can therefore review these log files to see complete contacts between two stations. This is especially useful when trying to

7.862	RTTY	50	850	ATA	1900	Albania news
9.058	RTTY	75	400	-	1530	TANJUG
9.358	FAX	120	576	-	-	DMI Oceanographic
13.508	FAX	120	576	-	-	Halifax Met
4.305	FAX	120	576	-	-	RN Northwood
8.145	FAX	120	576	-	-	Rome Met
17.068	FAX	60	576	-	-	Tokyo Press
11.476	RTTY	50	400	HFM36	1830	KCNA News
8.050	RTTY	50	400	9BC23	1900	IRNA English
7.65	RTTY	75	400	BZR67	1840	Xinhua English news
14.406	SWED-ARQ	100	400	SAM	1020	Swedish embassy
6.446	FAX	120	576	-	1335	N London
7.876	FAX	120	576	-	1520	Hamburg met
14.572	RTTY	50	400	-	-	JANA Tripoli
13.9684	FEC	100	170	HBD88	-	ICRC Red Cross
13.8467	ARQ-E3	100	400	FRVI	-	French army
13.4288	DUP-ARQ	125	300	HGX39	-	Hungarian embassy
19.32	RTTY	100	400	OMZ	0930	Czech Embassy
18.319	RTTY	100	400	OMZ	0955	Czechoslovakia
5.473	RTTY	50	850	CSY	2233	Santa Maria Azores
13.941	ARQ	100	170	-	1130	Tunis embassy
20.402	ARQ	100	170	-	1245	Indonesian news
20.724	ARQ	100	170	HCB	1310	UNHCR Switzerland
19.16	RTTY	75	400	DOR	0930	Bulgarian embassy
17.521	RTTY	50	400	HSW	1500	Bangkok Met
20.792	RTTY	75	850	PWN33	1315	Brazilian Navy
20.734	ARQ	100	170	-	1215	UNHCR Baghdad
9.318	FAX	120	576	NRK	1600	Iceland met
15.95	FAX	90	576	RKB78	1100	Moscow met

make use of information retrieved from bulletin boards.

## Letter Replies

I'm sorry to have to say that I'm no longer able to provide a personal response to all your detailed technical queries. This is due to a combination of pressures on my time, not the least of which is dealing with requests for JVFAK/HAMCOM and frequency lists. What I will continue to do is answer all the complicated technical queries through the column. I am also working on a series of Fact Sheets covering the most common areas like where to start and computer interference, etc. Hopefully, this will enable me to help a larger number of people with their listening problems. So please keep the questions coming. The first information pack on interference is ready this month, details below.

## Special Offers

The following special offers are available to Decode readers. Although I try to turn the orders around within a day or two you should allow up to two weeks for delivery (we might have tried to go on holiday or something!).

**JVFAX:** Provides FAX and SSTV reception, transmission and image viewing facilities for PC users.

**HAMCOM:** Provides RTTY and c.w. transceive facilities for PC users. This program is supplied with PKTMON12 enabling reception of h.f. and v.h.f. packet signals.

**Day Watson Beginners List:**

This comprises a chronological listing of reliable utility signals designed to ensure that the new listener can easily find some signals to decode. These are also some good listening tips and explanations. Version 2/94 is now available.

**Decode List:** This is a straightforward frequency list of around 3 to 4 pages of reports sent in over recent months by 'Decoders'.

**Fact Pack 1:** This fact sheet is on solving interference problems. With some three or four pages of hints and tips, it should help sort out some of the interference problems.

**Ordering Details:**

**JVFAX or HAMCOM:** For each program send a blank formatted 3.5in disk (720Kb or 1.44Mb) plus 50p and a self-addressed sticky label.

**Beginners or Decode List:** and a self-addressed sticky label.

**Both lists plus JVFAK or HAMCOM:** blank formatted 3.5in disk (720Kb or 1.44Mb) plus £1.50 and a self-addressed sticky label.

**Fact Pack 1 (interference):** sticky self-addressed label and 50p.

## Frequency List

Another fix of loggings from Decoders' **J. Fairfax, S. Workman, Steve Walker**, Geoff Crowley, Chris Durkin and Day Watson.



## long, Medium and Short Waves

**W**ith the approach of the peak holiday season perhaps this is a good time to remind you to take a small portable radio receiver with you! Exploring the bands while in a new or favourite location can be quite rewarding and your findings are bound to be of interest to the readers of LM&S.

If you do not own a suitable set, then may I suggest that you study the adverts in this issue. A wide range of portables are on offer, some of which are capable of quite remarkable performance.

### Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless stated, all logs compiled in the four week period ending April 30.

Checks made by **Fred Pallant** in Storrington revealed that the signals from Bechar, Algeria (1000kW) on 153; Nador, Morocco (2000kW) 171; Caltanissetta, Italy (10kW) 189; Azilal, Morocco (800kW) 207; Oslo, Norway (200kW) 216; St.Petersburg, Russia (2000kW) 234; Tipaza, Algeria (1500/750kW) 252; Taldom, Russia (250kW) 261 could only be heard here after dark.

Very good reception of the BBC World Service via Droitwich on 198kHz at night was noted in Belgium by **Wilfried Deryck** (Ichtegem). He rated their signal S1055 at 0358UTC.

Much to his surprise, **Tim Bucknall** (Congleton) has found that he can receive the 100kW signals from Reykjavik, Iceland on 207 every morning. They commence at 0645 except on Sunday, when they start at 0800.

### Medium Wave Reports

The propagation conditions for m.w. transatlantic DXing proved to be unfavourable most nights in April. Although CJYQ in St.John's, on 930 was heard at 0030 by **Ted Bardy** in N.London on April 2, their signal was only SINPO 12231. At 0200 he listened to a sports programme broadcast by VOCM in St.John's on 590. Their signal peaked 23332.

Frequent checks were made by **Ron Damp** in E.Worthing, but the only station that he could identify was WSSH in Boston, on 1510. At best they were 12221 at 0104 on April 4.

In contrast, the broadcasts from some stations in N.Africa and the Middle East were often logged here after dark. The Saudi Arabian outlets at Qurayyat on 549, Damman 1440 and Duba 1521 were logged by several listeners! Quite a number of the low power signals from Spain were received by **George Millmore** in Wootton, IoW.

The local radio broadcasts from BBC R.Kent on 1602 were received in Inverness by **Alec Griffiths**! He logged their 0.25kW transmission from Rusthall as 21222 at 2105. By using a loop ahead of his Kenwood R5000 receiver **Gerry Haynes** (Bushey Heath) was able to 'null-out' the overwhelming transmissions from nearby

stations and log for the first time ILR BRMB (Xtra-AM) on 1152; BBC R.Devon & Dorset 1458; also BBC R.Bristol 1548.

### Short Wave Reports

Conditions on the h.f. bands were generally poor during April. The 13 & 16m bands often closed early in the evening.

The **25MHz (11m)** band appears to have been vacated by all international broadcasters. The daily broadcasts from RFI via Allouis, France on 25.820 were not heard here during May.

Daily variations in propagation were observed in the **21MHz (13m)** band. Although intended for listeners in Asia, R.Australia's Darwin broadcast on 21.725 (Eng 0630-1100) often reached the UK. Sometimes it was very weak or inaudible. Under favourable conditions it rated 34333 at 0905 in Bushey Heath and S10233 at 1030 by **Kenneth Buck** in Edinburgh.

Also heard here in the morning were UAER, Abu Dhabi 21.735 (Ar to Eu 0900-1358), was 24222 at 0929 by **John Eaton** in Woking; BBC via Kranji 21.715 (Eng to SE.Asia 0900-1030) 25232 at 0930 by **Harry Richards** in Barton-on-Humber; DW via Trincomalee, 21.695 (Per? to M.East?) 1000-1050 (Eng ident 1049) 25443 at 1015 by **Eric Shaw** in Chester; UAER, Dubai 21.605 (Eng to Eu 1030-1055) S10444 at 1030 by **Bill Clark** in Rotherham; R.Pakistan, Islamabad 21.520 (Eng to Eu 1100-1120) 43333 at 1105 by **Chris Shorten** in Norwich.

After mid-day, UAER Dubai 21.605 (Eng to Eu 1300-1355) was S10344 at 1300 by **Phil Townsend** in E.London; RCI via Sines 21.455 (Eng to Eu, M.East, Africa 1330-1400) 55555 at 1350 by **Mary McPhillips** in Co.Monaghan; BBC via Limassol 21.470 (Eng to E.Africa 0430-1615) 33333 at 1405 by **Bernard Curtis** in Stalbridge; R.Portugal Int via Sines 21.515 (Eng to M.East, India? 1430-1500) 34122 at 1430 by **Eddie McKeown** in Newry; HCJB, Ecuador 21.455 (Eng, u.s.b. + p.c.) S10444 at 1500 by **John O'Halloran** in Harrogate; BBC via Ascension Is 21.660 (Eng to Africa 0730-1745) 44332 at 1620 by **Rhoderick Illman** in Oxted; WYFR via Okeechobee 21.525 (Eng to Eu, Africa 1600-1700) 35333 at 1658 in E.Worthing.

Later R.Nederlands via Bonaire 21.590 (Eng to Africa 1730-1925) was logged as 45444 at 1815 by **Darren Beasley** in Bridgwater; HCJB Quito 21.455 (Eng, u.s.b. + p.c.) as 44444 at 1830 by **Bill Griffith** in W.London, 35543 at 1906 by **David Edwardson** in Wallsend and 25444 at 1955 by **Chris Haigh** in Huddersfield; VOA via Greenville? 21.480 (Eng to Africa 2000-2200) 24433 at 2134 by **Geoff Crowley** in Aberdeen.

Conditions in the **17MHz (16m)** band were also unreliable. Sometimes R.Australia's Darwin broadcasts to S.Asia could be heard here on 17.880 (Eng 0600-0700) and 17.695 (Eng 0700-0900). They were logged as 24211 at 0605 in Bushey Heath and 33333 at

### Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	A,G,M*
153	Donebach	Germany	500	A,C,D,E*,F,G*,H,I,J,K,L,M,N,O,P,Q
153	Brasov	Romania	1200	C*,F*,J*
153	Ufa	Russia	500	F*
162	Allouis	France	2000	A,C,D,E*,F,G,I*,J,K,L,M,N,O,P,Q
171	Medi 1-Nador	Morocco	2000	A,F*,G,M*
171	Kaliningrad	Russia	1000	A,C,F*,J*,L,M,N,O,P,Q
177	Oranienburg	Germany	750	A,E*,F,J*,L,M,N,O,P,Q
180	Polati	Turkey	1200	A*,G
183	Saarlouis	Germany	2000	A,C*,D,E*,F,G,I*,J,K,L,M,N,O,P,Q
189	Caltanissetta	Italy	10	M*
198	Quarqla	Algeria	1000	G*
198	Warsaw 3	Poland	200	G*
198	BBC Droitwich	UK	500	A,C,D,E*,F,G,I*,J,K,L,M,N,O,P,Q
207	Munich	Germany	500	A,C,E*,F,G,H,J,K,L,M,N,O,P,Q
207	Reykjavik	Iceland	100	B
207	Azilal	Morocco	800	A,M*
216	RMC Roumoules	S.France	1400	A,C,E*,F,I*,J*,K,L,M,N,O,P,Q
216	Oslo	Norway	200	A,F*,G,M*
225	Raslyn Resv TX	Poland	?	A,C,E*,F*,G,H,I*,J*,K*,M,N,P,Q
234	Beidweiler	Luxembourg	2000	A,C,D,E*,F,G,I,J,K,L,M,N,O,P,Q
234	St.Petersburg	Russia	1000	J,M*,N*
243	Kalundborg	Denmark	300	A,C,E*,F,J,K,L,M,N,P,Q
252	Tipaza	Algeria	1500	I*,L,M*,N*,P*
252	Atlantic 252	Ireland	500	A,C,D,E*,F,G,I*,J,K,L,M,N,O,P,Q
261	Burg	Germany	200	?A,H*,I,L,M,N,P,Q
261	Taldom(Moscow)	Russia	2000	A,E*,F*,G*,J*,M*,N*
270	Topolina	Slovak Rep.	1500	A,C,E*,F*,G,H*,J,L,M,N,P,Q
279	Ashkhabad	Turkmenistan	150	A
279	Minsk	Belarus	500	A,C*,F,I*,J*,L,M*,N*,P,Q

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

#### Listeners:

A: Ted Bardy, N.London.  
B: Tim Bucknall, Congleton.  
C: Geoff Crowley, Aberdeen.  
D: Martin Dale, Stockport.  
E: Wilfried Deryck, Ichtegem, Belgium.  
F: John Eaton, Woking.  
G: Chris Haigh, Huddersfield.  
H: Simon Hockenhull, E.Bristol.  
I: Sheila Hughes, Morden.

J: Eddie McKeown, Newry.  
K: Mary McPhillips, Co.Monaghan.  
L: George Millmore, Wootton, IoW.  
M: Fred Pallant, Storrington.  
N: Harry Richards, Barton-on-Humber.  
O: Tom Smyth, Co.Fermanagh.  
P: Andrew Stokes, Leicester.  
Q: Phil Townsend, E.London.

0847 in E.Worthing.

Occupants of this band before noon include R.Pakistan, Islamabad 17.900 (Eng to Eu 0800-0845) 43333 in Stalbridge and 54445 by

**P.R.Guruprasad** in Vellore, India; Voice of Greece, Athens 17.525 (Gr, Eng to Aust 0850-0950), to Japan 1000-1050) 55555 at 0935 in Woking; R.Moscow Int 17.560 (Eng WS 1000-1300) S10444 at 1000 by **Tom Smyth** in Co.Fermanagh; Israel R, Jerusalem 17.575 (Eng to Eu? 1000-1030?) 35553 at 1008 in Wallsend; AIR Delhi 17.387 (Eng to Pacific areas 1000-1100) 34333 at 1045 in Bridgwater; R.Pakistan, Islamabad 17.900 (Eng to Eu 1100-1120) 32333 at 1107 by **Vera Brindley** in Woodhall Spa.

Those noted in the afternoon were R.Bulgaria, Sofia 17.625 (Eng to Aust 1200-1300) 53554 at 1203 in Newry; HCJB Quito 17.890 Eng to N.S.Am 1130-1600) S10322 at 1330 in Rotherham; Africa No. 1, Gabon 17.630 (Fr, Eng to W.Africa 0700-1600) S10333 at 1400 in E.London; R.Bulgaria, Sofia 17.705 (Eng to Asia 1400-1500) 54545 at 1415 in Co.Monaghan; R.Tunisia Int via Sfax 17.500 (Ar, Fr to ? 0700-1800) S10444 at 1550 in Edinburgh.

Later, VOA via Tangier, Morocco 17.895 (Eng to Africa 1600-2200) was 25442 at 1830 in Chester; R.Nederlands via Irkutsk 17.655 (Eng to W.Africa 1730-2025) S10333 at 1733 by **Philip Rambaut** in Macclesfield; Voice of Greece, Athens 17.525 (Gr, Eng to S.Africa 1800-1850?) 34333 at 1842 in Oxted; HCJB Quito 17.490 (Eng world-wide 1900-2000 u.s.b. + p.c.) 25232 at 1915 by **Tim Allison** in Middlesbrough; also 17.790 (Eng to Eu 1900-2000) 44444 at 1940 by **Sheila Hughes** in Morden; R.Nederlands via Bonaire 17.605 (Eng to W.Africa 1930-2025) 44444 at 2010 by **Robert Connolly** in Kilkeel; DW via Kigali 17.860 (Ger to Eu, Africa 1800-2200), heard at 2030 in Huddersfield;

R.Havana Cuba 17.760 (Eng to Eu 2100-2200) 34333 at 2100 by **Michael Griffin** in Ross-on-Wye; HCJB Quito 17.490 (Eng world-wide 2130-2200 u.s.b. + p.c.) 34444 at 2133 in Aberdeen.

From time to time R.New Zealand's **15MHz (19m)** broadcast to Pacific areas has reached the UK. Their 100kW transmission from Rangatāiki on 15.115 (Eng 2138-0658) was logged as 22211 at 2205 in Bridgwater and 25442 at 0645 in Co.Monaghan. R.Australia's broadcast to Pacific areas on 15.240 via Shepparton (Eng 0030-0730) has also been heard here in the early morning. In Bushey Heath it rated 24222 at 0606. Later, their broadcast to Asia on 15.565 (Eng 1100-1300) may be heard - it peaked S10333 at 1203 in Rotherham.

In the daytime, R.Korea, Seoul 15.575 (Eng to M.East, Africa 0800-0830) was 32222 at 0820 in Stalbridge and 54444 at 0820 in Vellore, India; BBC via Masirah Is, 15.310 (Eng to India, S.Asia 0900-1500) 22232 at 1014 in Barton-on-Humber; BBC via Limassol 15.575 (Eng to M.East 0400-1500) S10322 at 1115 in Macclesfield; SRI via Schwarzenburg? 15.505 (Eng, Fr, It, Ger to S.E.Asia 1300-1500) 24332 at 1314 in Oxted; Voice of Vietnam, Hanoi 15.010 (Fr, Eng to Eu, Africa 1300-1400) 35332 at 1340 in Ross-on-Wye; RCI via Sines 15.325 (Eng to Eu 1330-1400) 55555 at 1330 by **Clare Pinder** while in Appleby; UAER, Dubai 15.395 (Eng to Eu 1330-1400) 44333 at 1350 in Woodhall Spa; World Voice of Adventism via WCSN 15.665 (Eng to Eu 1500-1655) S10444 at 1510 in Edinburgh; China R, Int via Russia 15.540 (Ar to M.East 1600-1655) S10322 at 1600 in E.London; Africa No. 1, Gabon 15.475 (Fr to W.Africa 1600-1900) 45444 at 1650 in Woking. In the evening, RNB Brazil 15.265 (Eng, Ger to Eu 1800-2020) was 43333 at 1800 in Morden; R.Vlaanderen Int, Belgium 15.550 (Eng 1800-1830) 34222 at 1800 in Newry; Voice of Vietnam,

## Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof-Saale (BR)	Germany	0.2	B,N*	810	Berlin	Germany	5	B	1197	Cheltenham(V)	UK	1	Q*
520	Wurzburg (BR)	Germany	0.2	E*	810	Madrid(SER)	Spain	20	B,K,N*,Q*	1197	Wallasey(V)	UK	2	Q
531	Ain Beida	Algeria	600	B,K,Q*,Q*,U	810	Burghead(BBC)	UK	100	E,Q*,T	1206	Bordeaux	France	100	B,N,U
531	Torshavn	Faroe Is.	100	E	810	Westerglen(BBC)	UK	100	B,H,O,Q,U	1206	Wroclaw	Poland	200	K,Q*,T*
531	Leipzig	Germany	100	E*,H,N*,Q*,U	819	Bafra	Egypt	450	K,U	1215	COPE via ?	Spain	?	N*
531	RNE5 via ?	Spain	?	K,N*,Q*,O*	819	Toulouse	France	50	B,H,N*,Q*	1215	Virgin via ?	UK	?	B,E,F,H,I,O,R,T,U
531	Beromunster	Switzerland	500	Q*	819	Trieste	Italy	25	O	1215	Droitwich(V)	UK	105	Q
540	Wevre	Belgium	150/50	B,E,H,N*,Q*,U	819	Warsaw	Poland	300	K*,Q*,Q*	1224	Vidin	Bulgaria	500	N*,Q*,U
540	Solt	Hungary	2000	N*,Q*,U	828	Hannover(NDR)	Germany	100/5	N*,Q*	1224	COPE via ?	Spain	?	K,N,J*
540	Sidi Bennou	Morocco	600	K,Q*,Q*	828	Barcelona(SER)	Spain	50	K*	1224	Manningtree(V)	UK	0.5	B
540	Vitoria(EI)	Spain	10	K*	837	Nancy	France	200	B,G,N*,Q*	1233	Nitra	Slovakia	40	N
549	Les Trembles	Algeria	600	K,Q*,Q*,U	837	COPE via ?	Spain	?	K*,N*,Q*,Q*	1233	Virgin via ?	UK	?	B,Q,U
549	Thurmau (DLF)	Germany	200	B,E,F,G,H,N*,Q*,U,V	846	Rome	Italy	540	B,O,Q*,U	1233	Virgin via Swindon	UK	?	Q*
549	St.Petersburg	Russia	1000	N*	855	Berlin	Germany	100	N*	1242	Marseille	France	150	N*,Q*,U
549	Quarayyat	Saudi Arabia	2000	B*,H*	855	RNE1 via ?	Spain	?	B,E,F*,K*,N*,Q*,U	1242	Virgin via ?	UK	?	H,M*,Q*,U
558	Espo	Finland	100	E*,Q*	864	Sentah	Egypt	500	K*	1251	Marcali	Hungary	500	K*,N*,Q*,U
558	Rostock(NDR)	Germany	20	N*	864	Paris	France	300	B,G,N*,Q*,U	1251	Huisberg	Netherlands	10	B,N*,Q*,U
558	RNE5 via ?	Spain	?	K*,N*,Q*,Q*	864	Soucallomas(RNE1)	Spain	2	K*,N*,Q*	1260	Sera via ?	Spain	?	N*
558	Cima di Dentro	Switzerland	300	E	873	Frankfurt(AFN)	Germany	150	A*,B,F,H*,K*,L*,N*,Q*,U	1260	Guildford (V)	UK	?	B,E,H,M*,Q*,U
567	Berlin	Germany	100	N*	891	Huisberg	Netherlands	20	B,G,N*,U	1269	Neumunster(DLF)	Germany	600	F*,N*,Q*,T*,U
567	Tullamore(RTE1)	Ireland (S)	500	B,E,F,G,H,I*,Q*,O,T,U	873	Zaragoza(SER)	Spain	20	K*,N*,Q*,Q*	1289	COPE via ?	Spain	?	K,Q*
567	Laayoune	Morocco	50	K	882	COPE via ?	Spain	?	B,K*,N*,Q*,Q*	1278	Strasbourg	France	300	Q*
567	RNE5 via ?	Spain	?	K,N*,Q*	882	Washford(BBC)	UK	100	B,E,F,H,O,Q,T,U,V	1278	Dublin(Cork(RTE2)	Ireland (S)	10	F,N*,Q*,O*,T,U
576	Bechar	Algeria	400	K	891	Algiers	Algeria	600/300	B,H*,K*,N*,Q*,Q*	1287	Litomyšl(RFE)	Czech Rep.	300/200	0*,Q*,U
576	Muhlacker(SDR)	Germany	500	B,E,G,H,N*,Q*	891	Huisberg	Netherlands	20	B,G,N*,U	1287	Melnik(RFE)	Czech Rep.	400	K,N,Q*,T*
576	Riga	Latvia	500	K,*	900	Milan	Italy	600	E,K*,N*,Q*,U	1287	Lerida(SER)	Spain	10	H*,K*,Q*,U
576	Barcelona(RNE5)	Spain	50	B,K,N*,Q*,Q*	900	COPE via ?	Spain	?	H*,K*,N*,Q*,Q*	1296	Valencia(COPE)	Spain	10	H*,K*,N*,Q*,U
585	Paris(FIP)	France	8	G,H,N*,Q*,U,V	909	Mallorca(RNE5)	Spain	10	K*	1296	Orfordness(BBC)	UK	500	B,F*,Q*,T*,U
585	Madrid(RNE1)	Spain	200	B,E,F*,F*,H*,K,N*,Q*,O*,Q*,T*	909	B'mans Pk(BBC5)	UK	140	O,T,U	1305	Rzeszow	Poland	100	K*,Q*,U
585	Gafsa	Tunisia	350	H*	909	Westerglen(BBC5)	UK	50	E	1301	Zgharta (VFUL)	Lebanon	7	P*
585	Dumfries(BBCScot)	UK	2	E,N,Q	918	R,Ljubljana	Slovenia	600/100	H*,K,N*,Q*,O*,U	1314	Kvitsoy	Norway	1200	B,E,F,H,N*,Q*,O*,U
594	Frankfurt(HR)	Germany	1000/400	B,E,F,G,H,N*,Q*,U	918	Madrid(R,int)	Spain	20	H*,K,N*,Q*,Q*	1314	RNE5 via ?	Spain	?	B,K
594	Oujda-1	Morocco	100	K,N*,Q*	918	Wolverhampton	Belgium	300	B,E,N,O,Q*,U,V	1323	Wachenbrunn(RMW)	Germany	1000/150	F,N,Q*,T*,U
594	Muge	Portugal	100	B,H,N*,Q*,U	927	Zekynthos	Greece	50	B*	1332	Rome	Italy	300	B,F*,N*,Q*,U
603	Lyon	France	300	N*	927	Izmir	Turkey	200	B*	1341	Lakihegy	Hungary	300	N*
603	Sevilla(RNE5)	Spain	50	K,N*,Q*	936	Bremen	Germany	100	B,F*,N*,Q*,Q*,U	1341	Lisnagarvey(BBC)	Ireland (N)	100	F,H*,J*,L*,Q*,O*,T,U
603	Newcastle(BBC)	UK	2	E*,K,N*,Q*,R	936	Venezia	Italy	20	N*	1341	Almeria(OCR)	Spain	2	K*
612	Athlone(RTE2)	Ireland (S)	100	E,F,H,O,Q,T,U	936	RNE5 via ?	Spain	?	E,H*,K*	1341	Tarrasa(SER)	Spain	2	K*,Q*
612	Sebaa Aïoun	Morocco	300	B	936	Lvov	Ukraine	500	K,Q*	1350	Nancy(Nice)	France	100	B,F*,N*,Q*,U
612	RNE1 via ?	Spain	10	B,K,N*,Q*,Q*	945	Toulouse	France	300	B,F*,Q*,O,U	1359	Melilla	Morocco	5	N,Q*
621	Wavre	Belgium	80	B,E,G,H,O,Q,U	954	Brno(Dobrochov)	Czech Rep.	200	N*	1359	Arganda (RNE-FS)	Spain	600	H*,K*,Q*,U
621	RNE1 via ?	Spain	10	K	954	Madrid(Cl)	Spain	20	B,F*,K*,N*,Q*,U	1368	El Kharga	Egypt	10	K*
621	Barcelona(OCR)	Spain	50	K,N*,Q*	963	Pori	Finland	600	B,E,F,LN*,Q*,O*,T,U	1368	Foxdale(Manx R)	I.O.M.	20	C,E,F*,M,O*,Q*
630	Vigra	Norway	100	E*,F,K,N*,Q*,T*	963	Paris	France	8	O	1377	Lille	France	300	B,E,H,N*,Q*,O*,U,V
630	Tunis-Djeida	Tunisia	800	K,N*	972	Hamburg(NDR)	Germany	300	B,E,F*,N*,Q*,U	1377	AIR Hyderabad	India	10	J
639	Praha(Bliche)	Czech	1500	E*,Q*,Q*,U	972	RNE1 via ?	Spain	?	K*,O*	1386	Athens	Greece	50	B*
639	RNE1 via ?	Spain	?	B,E,F*,H*,K,N*,Q*,O*	972	Nikolayev	Ukraine	500	K,O*,U	1386	Kaliningrad	Russia	500	EL*,N*,Q*,O*,U
648	Orfordness(BBC)	UK	500	B,C,E,G,H,M,O*	981	Alger	Algeria	600/300	B*,K*	1393	Lushnjë(Tirana)	Albania	1000	N*,Q*,U
657	Neubrandenburg(NDR)	Germany	250	B,N*,Q*,U	990	Berlin	Germany	300	N*,T	1413	Maistras (BBC)	Oman	1500	J
657	Napoli	Italy	120	E,K	990	R,Bilbao(SER)	Spain	10	B,K*,Q*,Q*	1413	RNE5 via ?	Spain	?	K,Q*,U
657	Madrid(RNE5)	Spain	20	K,N*,Q*,T*	990	Redmoss(BBC)	UK	1	E,N*	1413	Pristina	Yugoslavia	1000	O*
657	Wrexham(BCWales)	UK	2	B,E*,F,H,M,N*,Q*	999	Schwerin(RIAS)	Germany	20	K*	1422	Heusweiler(SR)	Germany	1200/600	B,F,H*,J,N,O*,Q*
666	R,Vilnius	Lithuania	500	K	1008	Las Palmas(SER)	Gran Canaria	?	K*,N*,Q*,U	1440	Marnach(RTL)	Luxembourg	1200	B,N,O*,R,U
666	Lisboa	Portugal	135	E,F,O*	1008	Flevó(Hilv-5)	Holland	400	B,E,F,M,N,O*,Q*,U	1440	Dammar	Saudi Arabia	1600	H*,N*,Q*,R
675	Marseille	France	600	E,K*,Q*	1017	Rheinsender(SWF)	Germany	600	B,E,F*,J*,N*,Q*,U	1449	Berlin	Germany	5	H*,N,Q*
675	Lopic(R10 Gold)	Holland	120	B,O,F*,G,M,N*,Q*,O*,R,S,V	1017	RNE5 via ?	Spain	?	B,K*,N*,Q*,U	1449	Squinzano	Italy	50	K
755	Bodo	Norway	10	H,U*	1026	SER via ?	Spain	?	B,K,O*	1449	Redmoss(BBC)	UK	2	E,N,Q
684	Sevilla(RNE1)	Spain	500	B,E,F*,H*,K,N*,Q*,O*	1035	Tallinn	Estonia	500	K*,Q*	1458	Lushnjë(Tirana)	Albania	500	H*,K*,Q*,U
684	Beograd	Yugoslavia	2000	H*,K,N*,Q*	1035	Milan	Italy	50	K,M*,Q*	1458	Esfahan	Iran	200	0*
693	Burghhead(BBC5)	UK	50	E	1035	Lisbon(Prog3)	Portugal	120	K,N*,Q*	1467	Monte Carlo(TWR)	Monaco	1000/400	F*,N*,Q*,O*
693	Orobitwic(BBC5)	UK	150	B,F,O,L,N*,Q*,V	1044	Dresden	Germany	250	N*,T	1467	Wien-Bismarck	Austria	600	F*,K,N*,Q*,O*
693	Enniskillen(BBC5)	UK	1	H*	1044	Sebaa Aïoun	Morocco	300	O*	1485	SER via ?	Spain	?	K,Q*
702	Fleensburg(NDR)	Germany	5	N*	1044	S,Sebastopol(SER)	Spain	10	B,K,N*,Q*,O*	1485	Bournem th(BBC)	UK	2	K,Q,D
702	Presov	Slovak Rep.	400	G,K	1044	Zaragoza(COPE)	Spain	10	N*	1485	Carlisle(BBC)	UK	1	C
702	Zamora(RNE1)	Spain	10	K*	1044	Burghhead(BBC1)	UK	20	E,T	1494	Clermont-Ferrand	France	20	B,F,H*,M*,N,O,Q*
711	Renesse 1	France	300	B,G,L,N*,Q*,V	1044	Droitwich(BBC1)	UK	150	B,F,O,U,V	1494	St.Petersburg	Russia	1000	H*,N*,Q*,O*
711	Laayoune	Morocco	600	K,O*	1062	Kalundborg	Denmark	250	B,E,M,N,O*,Q,U	1503	Stargard	Poland	300	K,N,Q*,Q*,T*
711	Murcia(COPE)	Spain	5	N*	1071	Brest	France	20	N,Q	1503	RNE5 via ?	Spain	?	H,K*
720	Langenberg	Germany	200	G,K	1071	France-Inter.	France	?	F*,H,O*	1512	Wolverhampton	Belgium	600	B,F,H*,M*,N,O,Q*
720	AIR Madras	India	200	J	1071	Lille	France	40	B,E,V	1521	Kosice(Czatice)	Slovakia	600	K,N,O*,Q*,U
720	Lisnagarvey(BBC4)	Ireland (N)	10	C,E,F,O,T	1071	Riga	Latvia	50	O*	1521	Duba	Saudi Arabia	2000	B*,Q*,Q*
720	Norte	Portugal	100	K,N*,Q*	1071	Bilbao(El)	Spain	5	B,K,M*,N*	1521	R,Manresa(SER)	Spain	2	K,Q*,T*
720	Sfax	Tunisia	200	O*	1080	Katowice	Poland	1500	E,M*,N*,Q*,O*,U	1530	Vatican R	Italy	150/450	H*,M*,N,O*,Q*
720	Lots Rd,Ldn(BBC4)	UK	0.5	H,O,U	1080	Toledo(OCR)	Spain	5	O*,U	1530	Maintlingen(DLF)	Germany	700	F*,H*,K,N*,Q*,U
729	Cork(RTE1)	Ireland (S)	10	Q*,T	1080	SER via ?	Spain	?	B,M*,N*,Q*	1557	Nice	France	300	H*,N*,Q*
729	RNE1 via ?	Spain	?	F*,G*,K,N*,Q*,O*	1088	Nitra(Jarok)	Slovakia	1500	N*,O*	1566	Sarmen	Switzerland	300	Q*
738	Paris	France	4	B,G,O	1089	SER via ?	Spain	?	E,N*,T,U	1566	Sfax	Tunisia	1200	K*,Q*
738	AIR Hyderabad	India	50	J	1089	RNE5 via ?	Spain	?	E,N*,T,U	1575	Genova	Italy	50	K*,Q*
738	Poznan	Poland	300	N*,Q*	1089	AFN via ?	Germany	10	L*,N*,Q*	1575	SER via ?	Spain	5	H*,K*,Q*,O*,U
738	Barcelona(RNE1)	Spain	500	F*,H*,K,N*,Q*,O*,U	1089	RNE5 via ?	Spain	?	B,F*,N*,Q*,O*	1584	SER via ?	Spain	2	H*,K*,Q*
747	Flevo(Hilv2)	Holland	400	B,E,F,G,H,M,N*,Q*,O*	1089	UK	0.5	E,F,O,U	1593	Matruh	Egypt	10	K*	
747	Cadiz(RNE5)	Spain	10	K,Q*	1116	Bari	Italy	150	K	1593	Isfahan	Iran	100	E*
756	Braunschweig(DLF)	Germany	800/200	B,E,F*,G,H,M,N*,Q*,T*,U	1116	Quarzataze	Morocco	15	K*	1602	SER via ?	Spain	?	H*,K*,Q*,U
756	Lugoi	Romania	400	D*	1116	Pontevedra(SER)	Spain	5	E,K	1602	Vitoria(EI)	Spain	10	E*,K*,Q*,O*
756	Bilbao(EI)	Spain	5	K,Q*	1125	Oceanovec	Croatia	100	N*	1611	Vatican R	Italy	15	B*,K,N*,Q*,U
756	Redruth(BBC)	UK	2	B	1125	RNE5 via ?	Spain	?	B,E*,F*,K,N*,Q*,O*	1611	R,Manresa(SER)	Spain	2	K,Q*,T*
765	Sottens	Switzerland	500	E,F*,N*,Q*,O*,U	1125	Llandrindod Wells	UK	1	Q	1620	Vatican R	Italy	100	H*,M*,N,O*,Q*
774	Abis	Egypt	500	U*	1125	Zadar	Croatia	600/						

## 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 R	I	7.50	E,F,H,N,O,T	1260	Marcher Snd(Gold)	I	0.64	M,O
585	R.Solway	B	2.00	A,L*,M,O,P,Q	1260	Sunrise R	I	0.29	H,R,T
603	Cheltenham(CD603)	I	?	F,H,J,N,O,P,T	1260	R.York	B	0.50	A,P
603	Invicta SG(Coast)	I	0.10	E,F,H,K*,N,O,T	1278	Bradford(Gt.Yks)	I	0.43	A,D,F*,H,O,P
630	R.Bedfordshire(3CR)	B	0.20	C,F,H,N,O,P,T	1305	Barnsley(Gt.Yks)	I	0.15	H,O,P
630	R.Cornwall	B	2.00	E,M,N	1305	Red Dragon(Touch)	I	0.20	D,F,K,N,O,T
657	R.Clwyd	B	2.00	A,H,M,N,O,P,Q,T	1323	R.Bristol(Som.Snd)	B	0.63	H,L*,O,T
657	R.Cornwall	B	0.50	N	1323	Brighton(SCR)	I	0.50	F,H,N,O,S,T
666	DevonAir R	I	0.34	F,H,J,M,N,O,T	1332	Hereward R(WGMS)	I	0.60	A,H,K*,O,P,R,S,T
666	R.York	B	0.80	A,C,H,K,M,O,P,T	1332	Wiltshire Sound	B	0.30	H,K,N,O,T
729	BBC Essex	B	0.20	A,E,F,H,N,O,P,R,T	1359	Essex R(BreezeAM)	I	0.28	A,H,T
738	Hereford/Worcester	B	0.037	F,H,N,O,P,R,T	1359	MerciaSnd(Xtra-AM)	I	0.27	H,O
756	R.Cumbria	B	1.00	H,M,P	1359	R.Solent	B	0.85	H,N
756	R.Maldwyn	I	0.63	H,N,O,T	1368	R.Lincolnshire	B	2.00	H,O*,P,Q,R,T
765	BBC Essex	B	0.50	A,E,F,H,N,O,P,T	1368	R.Sussex & Surrey	B	0.50	F,H,K,N,O,S,T
774	R.Kent	B	0.70	E,F,H,N,O,T	1368	Wiltshire Sound	B	0.10	H,K,N
774	R.Leeds	B	0.50	A,D,H,P	1413	Sunrise R	I	0.125	A,F,H,K,N,S,T
774	Gloucester(3CSG)	I	0.14	N,O	1431	Essex R(BreezeAM)	I	0.35	A,H,N,O,Q,T
792	Chitern(S.Gold)	I	0.27	E,F,H,N,P,R,T	1431	R.210 (CL.Gold)	I	0.14	H,N,O,P,T
792	R.Foye	B	1.00	M	1449	R.Peterborough/Cambs	B	0.15	H,K,N,O,P,R,T
801	R.Devon & Dorset	B	2.00	F,H,J,L*,M,N,O,T	1458	R.Cumbria	B	0.50	M,O
828	Chiltern(S.Gold)	I	0.20	E,F,H,O,T	1458	R.Devon & Dorset	B	2.00	H*,N,T
828	R.Aire(Magic828)	I	0.12	A,D,P	1458	R.Newcastle	B	2.00	G*
828	R.WM	B	0.20	H,O	1458	Radio WM	B	5.00	B,H*,O,R
828	2CR (Cl.Gold)	I	0.27	H,N,T	1458	Sunrise R	I	5.00	O*,F,G,H,K,N,O,P,O,T
837	R.Cumbria/Furness	B	1.50	A,L*,O	1476	Guilford(M.Xtra)	I	0.50	C*,H,K*,M*,N,O,T
837	R.Leicester	B	0.45	D,F,H,K,N,O,P,R,T	1485	R.Humberside	B	1.00	A,P
855	R.Devon	B	1.00	N	1485	R.Merseyside	B	1.20	A,D,G*,H,M,O,Q
855	R.Lancashire	B	1.50	D,M,P	1485	R.Sussex & Surrey	B	1.00	F,H,K,N,S,T
855	R.Norfolk	B	1.50	A,E,H,P,T	1503	R.Stoke-on-Trent	B	1.00	A,C,D,H,K,M*,N,O,P,R,T
855	Sunshine R	I	0.15	H,O,T	1521	Reigate(M.Xtra)	I	0.64	A,C*,H,K*,M*,N,O,S,T
873	R.Norfolk	B	0.30	C,E,F,H,N,O,P,T	1530	Huddersfield(Gt.Yks)	I	0.74	A,C,D,H,O,P
936	Brunel R(Cl.Gold)	I	0.18	F,H,I,N,D,T	1530	R.Essex	B	0.15	F,H,N,S,T
945	R.Trent(Gem AM)	I	0.20	D,H,L*,M*,N,O,P,R,T	1530	R.Wyvern(WYVN)	I	0.52	H,M*,N,D
954	DevonAir(Cl.Gld)	I	0.32	C,N,T	1548	Capital R(Cap G)	I	97.50	C,H,K*,N,O,T
954	R.Wyvern(WYVN)	I	0.16	H,I,O,P,T	1548	R.Bristol	B	5.00	H*,M*,N
990	WABC(Nice & Easy)	I	0.09	H,D,O,T	1548	Liverpool(City G)	I	4.40	M,O
990	R.Devon & Dorset	B	1.00	H,N,O,T	1548	R.Forth (Max AM)	I	2.20	A,C,M
990	Hallam R(Gt.Yks)	I	0.25	H,P,T	1548	Sheffield(Gt.Yks)	I	0.74	P
999	R.Solent	B	1.00	F,H,N,S,T	1557	Chiltern R(Gold)	I	0.76	H,L*,M*,D,P,R
999	R.Trent(Gem AM)	I	0.25	H,O,P,T	1557	Southampton(SCR)	I	0.50	F,H,M*,N,T
999	Red Rose(Gold)	I	0.80	A,L*,M	1557	R.Lancashire	B	0.25	A,M,D
1017	Beacon R(WABC)	I	0.70	D,F,H,M,N,D,P,T	1557	Tendring(Mellow)	I	?	H*,T
1026	Downtown R	I	1.70	M,Q	1584	Kettering(KCBC)	I	0.04	H,N,O*,T
1026	R.Cambridgeshire	B	0.50	H,K,P,R,T	1584	R.Nottingham	B	1.00	A,D,H,N,P,R
1026	R.Jersey	B	1.00	H,K,N,T	1584	R.Shropshire	B	0.50	H*,O
1035	NorthSound R	I	0.78	C,G*,H,K*,D,P	1584	R.Tay	I	0.21	O*
1035	R.Sheffield	B	1.00	D,G*,H,P,R	1602	R.Kent	B	0.25	A,F,G*,H,N,O,T
1035	West Sound R	I	0.32	M					
1107	Moray Firth R	I	1.50	A,O					
1116	R.Derby	B	1.20	A,C,D,H,M,D,P,R,T					
1116	R.Guernsey	B	0.50	F,H,N,T					
1152	BRMB(Xtra-AM)	I	3.00	H*,O,R					
1152	LBC(L.Talkback R)	I	23.50	C*,H,K*,N,T					
1152	Piccadilly R(Gold)	I	1.50	D,O					
1152	R.Broadland	I	0.83	L*,T					
1152	R.Clyde(Clyde 2)	I	3.06	M					
1161	Brunel R(Cl.Gold)	I	0.16	H,N,O,T					
1161	R.Bedfordshire(3CR)	B	0.10	H,R,T					
1161	R.Sussex & Surrey	B	1.00	F,H,K,N,T					
1161	R.Tay	I	1.40	A,C*,M*,O*					
1161	Humberside(GLYks)	I	0.35	O,P					
1170	Hi Wycombe 1170AM	I	?	F,H,T					
1170	Portsmouth (SCR)	I	0.12	H,N,T					
1170	Signal R(S.Gold)	I	0.20	C*,D,H*,O,R					
1242	Invicta Snd(Coast)	I	0.32	H,K*,S,T					
1242	Isle of Wight R	I	0.50	C,H,J,N					
1251	Saxon R(SGR)	I	0.76	H,D,S,T					
1260	Brunel R(Cl.Gold)	I	1.60	G,N					

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

### Listeners:

- A: Leo Barr, Sunderland.
- B: Tim Bucknall, Congleton.
- C: Geoff Crowley, Aberdeen.
- D: Martin Dale, Stockport.
- E: Wifried Derynch, Ichtegem, Belgium.
- F: John Eaton, Woking.
- G: Alec Griffiths, Inverness.
- H: Gerry Haynes, Bushey Heath.
- I: Francis Hearne, N.Bristol.
- J: Simon Hockenhull, E.Bristol.
- K: Sheila Hughes, Morden.
- L: Eddie McKeown, Newry.
- M: Mary McPhillips, Co.Monaghan.

Hanoi 15.010 (Eng, Fr, Sp to Eu 1800-2130) SIO434 at 1815 in Harrogate; Voice of Greece, Athens 15.650 (Gr, Eng to Africa 1800-1850) 44444 at 1845 in Bridgwater; WINB, Red Lion 15.715 (Eng to Africa, Eu 1600-2100) 25322 at 1847 in Huddersfield; HCJB Quito 15.270 (Eng to Eu 1900-2000) 33333 at 1918 in Middlesbrough; VOA via Morocco 15.205 (Eng to Eu, M.East, N.Africa 1500-2200) 44444 at 1920 by **Peter Pollard** in Rugby; WWCR, Nashville 15.685 (Eng to Eu 1200-2200) 33433 at 2010 in Kilkeel; RCI via Sackville 15.325 (Eng to Eu 2030-2130) SIO433 at 2115 by **Kimberley Cliff** in Northampton; BBC via Ascension Is 15.400 (Eng to Africa 1500-2315) 45434 at 2115 by **Simon Hockenhull** in E.Bristol; Monitor R.Int via WSHB 15.665 (Eng to Eu 1900-2200) 54444 at 2130 in Norwich; R.Copan Int, Honduras 15.675 (Sp, Eng to Am 2100-2230) 35333 at 2140 by **Ross Lockley** in Stirling; BBC via Ascension Is 15.260 (Eng to S.Am 2000-0330) 34432 at 2145 in Chester; R.Damascus, Syria 15.095 (Eng to USA 2110-2210) 32232 at 2205 by **Robin Harvey** in Bourne.

More favourable conditions often existed in the **13MHz (22m)** band and reception from some areas was reported as good. SRI via Sottens? 13.685 (It, Eng, Fr, Ger, Port to Aust, S.Pacific 0830-1100) was 55555 at 0900 in Appleby; R.Australia via Darwin on 13.605 (Eng, Chin to Asia 0900-1355) 44443 at 0910 by **George Tebbitts** in Penmaenmawr and 45344 at 1145 in Newry; SRI via Sottens? 13.635 (Eng, Fr, It, Ger to SE/S.Aisia 1300-1700) 24332 at 1314 in Oxted and 55444 at 1510 in Vellore; WYFR via Okeechobee 13.695 (Eng to N.Am 1300-1400) 44433 at 1343 in Bushey Heath; UAER, Dubai 13.675 (Eng to Eu 1330-1400) 24222 at 1352 in Woodhall Spa; Croatian R, Zargreb 13.830 (Cr, Eng to Eu 24hrs) 25333 at 1425 in Barton-on-Humber; R.Austria Int via Moosbrunn 13.730 (Ger, Eng, Fr, Sp to Eu 0400-1800) 55545 at 1430 in Ross-on-Wye; R.Netherlands via Flevo 13.700 (Eng to S.Aisia, M.East 1330-1625) SIO222 at 1542 in Rotherham; UAER, Dubai 13.675 (Eng to Eu 1600-1640) SIO455 at 1601 in Edinburgh; R.Pakistan, Islamabad 13.590 (Eng to M.East 1600-1630) 55444 at 1610 in Bourne.

Bridgwater; VOA via Botswana 13.710 (Eng to Africa 1600-2200) SIO322 at 1700 in Co.Fermanagh, AWR (KSDA) Guam 13.720 (Eng 1700-1900, Sat/Sun only) 32432 at 1700 in Stirling.

Later, SRI via Sottens? 13.635 (Eng, Ger, It, Fr to M.East, E.Africa 1700-1900) was SIO333 at 1815 in Macclesfield; DW via Julich? 13.790 (Eng to W.Africa 1900-1950) 34333 at 1930 in Co.Monaghan; also 13.690 (Eng to W.Africa, M.East 1900-1950) 33333 at 1949 in E.Worthing; BBC via Rampisham 13.660 (Ar to M.East, Africa 1300-2100) SIO433 at 1945 in Harrogate; RCI via Sackville 13.650 (Eng to W.London; SIO433 at 1950 in Ross-on-Wye; VOA via Gloria? 9.770 (Eng 1700-2100) 44554 at 1955 by **John Parry** in Northwich; R.Bulgaria, Sofia 9.700 (Eng 2100-2200) 44444 at 2130 in Rugby; R.Cairo, Egypt 9.900 (Eng 2115-2245) 34323 at 2136 in Middlesbrough; AIR via Delhi? 9.950 (Eng 2045-2230) 44333 at 2218 in Bourne.

Among those noted to other areas were SRI via Sottens? 9.885 (It, Eng, Fr, Ger, Port to Aust, S.Pacific 0830-1100) 44344 at 0900 in Appleby; R.Austria Int via Moosbrunn 9.870 (Ger, Sp, Eng to W.Africa 1300-1500) SIO433 at 1436 in

to Eu 0700-0830) 43333 at 0740 in Bourne; R.Moscow Int 11.805 (Eng WS 0830-1100?) 55455 at 0830 in Co.Monaghan; Vatican R, Italy 11.740 (News in It, Fr, Eng to Eu 1000-1030) 54444 at 1020 in Morden; BBC via Skelton 12.095 (Eng to Eu, N.W.Africa 0400-2215) 44322 at 1051 in Barton-on-Humber, R.Sweden via Horby? 11.650 (Sw to ? 1030-1100) SIO444 at 1056 in Macclesfield; R.Finland via Pori 11.900 (Eng to W.Europe, USA 1130-1200) 54444 at 1137 in Norwich.

After mid-day, Polish R, Warsaw 11.815 (Eng to Eu 1200-1255) was 52443 at 1245 in Newry; R.Romania Int, Bucharest 11.940 (Eng to Eu 1300-1400) 33343 at 1346 by **Martin Dale** in Stockport; WYFR via VOFC Taipei 11.550 (Eng to India 1302-1502) 34433 at 1347 in Bushey Heath; Voice of the Mediterranean, Malta 11.925 (Eng, Ar to N.Africa 1400-1600) 44333 at 1403 in Woodhall Spa; ERA, Thessaloniki 11.595 (Gr to Europe 1000-2255) SIO455 at 1410 in Edinburgh; R.Australia via Carnarvon 11.660 (Eng, Chin to S.Aisia 1430-1800) SIO322 at 1432 in Rotherham; FEBC Boceau, Philippines 11.995 (Eng to India, SE.Asia 1300-1600) 34333 at 1505 in Stirling and 55454 at 1535 in Vellore; BSKSA Riyadh 11.730 (Ar to N.Africa 1600-1800) 44444 at 1601 in Woking.

Later, AIR via Bangalore 11.620 (Eng, Hi to Eu 1745-2230) was SIO333 at 1800 in Co.Fermanagh; R.Kuwait via Kabd 11.990 (Eng to Eu 1800-2100) 44444 at 1821 in Oxted; R.Bulgaria Int, Sofia 11.720 (Eng to Eu 1900-2000) heard at 1900 in Congleton; REE via Noblejas 11.775 (Eng to ? 1900-2000) 42444 at 1900 in Appleby; Israel R, Jerusalem 11.588 (Heb to Eu, USA 1400-2300?) SIO433 at 2020 in Harrogate; R.Damascus, Syria 12.085 (Eng to Eu 2005-2105) 33443 at 2050 in Kilkeel; R.Bulgaria Int, Sofia 11.720 (Eng to USA 2100-2200) 43444 at 2100 in Rugby; R.Japan via Moyabi 11.925 (Eng to Eu 2100-2155) 44434 at 2100 in Penmaenmawr; Israel R, Jerusalem 11.603 (Eng to W.Eu, USA 2100-2200) 45343 at 2142 in Ross-on-Wye; R.Nac da Amazonia, Brazil 11.780 (Port 0900-0200) 23442 at 2235 in Bridgewater; Voice of Turkey, Ankara 11.710 (Eng to Eu 2200-2300) 33453 at 2250 in Middlesbrough.

Sometimes the conditions in the **9MHz (31m)** band have enabled R.New Zealand's broadcast to Pacific areas to reach the UK. Their 100kW transmission on 9.700 (Eng 0759-1206) was 13322 at 0930 by **Leo Barr** in Sunderland and SIO333 at 1120 in Rotherham.

Quite a number of the signals in this band are meant for Europe. Those noted came from R.Portugal, Lisbon 9.815 (Port 0700-2000 Sat/Sun) 55555 at 0700 in W.London; SRI via Lenk? 9.535 (Eng 1000-1030) 44554 at 1027 in Stockport; R.Jordan via Al Karanah 9.560 (Ar, Eng 1500-1730) 54344 at 1532 in Norwich; R.Mediterranean Int via Nardor 9.575 (Fr, Ar 0500-0100) SIO433 at 1600 in E.London; VOIRI, Tehran 9.022 (Eng 1930-2030) 55444 at 1950 in Ross-on-Wye; VOA via Gloria? 9.770 (Eng 1700-2100) 44554 at 1955 by **John Parry** in Northwich; R.Bulgaria, Sofia 9.700 (Eng 2100-2200) 44444 at 2130 in Rugby; R.Cairo, Egypt 9.900 (Eng 2115-2245) 34323 at 2136 in Middlesbrough; AIR via Delhi? 9.950 (Eng 2045-2230) 44333 at 2218 in Bourne.

Among those noted to other areas were SRI via Sottens? 9.885 (It, Eng, Fr, Ger, Port to Aust, S.Pacific 0830-1100) 44344 at 0900 in Appleby; R.Austria Int via Moosbrunn 9.870 (Ger, Sp, Eng to W.Africa 1300-1500) SIO433 at 1436 in

## Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer	Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	1936	G,O	4.830	R.Tachira	Venezuela	0110	B,F,L
2.325	ABC Tennant Creek	Australia	1855	G	4.835	R.Tezulutlan, Coban	Guatemala	0040	B
2.485	ABC Katherine	Australia	0937	G,O	4.835	RTM Bamako	Mali	1958	B,C,F,K,L,O
3.220	R.HCJB Quito	Ecuador	0246	L	4.840	AIR Bombay	India	1637	G
3.223	AIR Shimla	India	1741	N	4.840	R.Valera, Trujillo	Venezuela	0020	B
3.240	TWR Shona	Swaziland	1908	G,L,N	4.845	ORTM Nouakchott	Mauritania	2044	B,L,O
3.245	AIR Lucknow	India	1716	B,G	4.850	R.Yaounde	Cameroon	2138	B,C,L
3.255	BBC via Maseru	Lesotho	2006	G	4.855	R.Contenano	Bolivia	0010	B
3.270	SWABC 1, Namibia	S.W.Africa	1937	G,L,O	4.860	AIR Kingsway(Feeder)	India	1848	E,G,M,O
3.277	AIR Srinagar	India	1624	G	4.865	PBS Lanzhou	China	2242	B,C,G
3.290	SWABC 2, Namibia	S.W.Africa	1903	B,G	4.865	Caracol	Colombia	0240	C,H,L
3.300	R.Cultural	Guatemala	0510	L,N	4.865	LV. del Cinaruco	Colombia	0005	B,M
3.315	AIR Bhopal	India	1645	G	4.870	R.Cotonou	Benin	1932	B,C,H,L,O
3.316	SLBS Godesrich	Sierra Leone	1953	B,E,L,O	4.885	R.Clube do Para	Brazil	0040	B
3.325	FRCN Lagos	Nigeria	2124	E,L	4.885	R.Difusora Areacana	Brazil	0040	B
3.335	CBS Taipei	Taiwan	1940	G,O	4.895	KBC Nairobi	Kenya	1853	L,M,O
3.338	R.Maputo	Mozambique	0320	N	4.890	RFI Paris	via Gabon	0408	L
3.340	R.Alura	Peru	0100	B	4.895	Voz do Rio Arauca	Colombia	0045	B
3.355	AIR Kursong	India	1641	G	4.896	Pakistan BC	Pakistan	1857	G,O
3.356	R.Botswana	Gaborone	1840	O	4.900	SBL Colombo	Sri Lanka	1857	G
3.359	RTV Malagasy	Madagascar	1744	G	4.905	R.Relogio, Rio	Brazil	0050	B
3.365	R.Rebelde, La Julia	Cuba	0115	B	4.905	R.Nat'N djemena	Chad	1938	B,C,L,M,O
3.365	GBC R-2	Ghana	1939	B,O,E,F,O,P	4.910	R.Jaipur	India	1740	G,M,O
3.365	AIR Delhi	India	1817	G	4.910	R.Zambia, Lusaka	Zambia	1831	G,O
3.380	R.Malawi	Malawi	1940	G,O	4.915	GBC-1, Accra	Ghana	2102	B,C,E,L,M,O
3.385	RFO Cayenne	Guiana	0010	B	4.915	Voice of Kenya	Kenya	1754	O
3.395	RRI Tanjungkarang	Indonesia	2211	G	4.920	R.Quito	Ecuador	0040	B
3.870	Voz de la Esperanza	Peru	0015	B	4.920	AIR Madras	India	1707	G
3.905	AIR Kingsway(Feeder)	India	1603	G	4.925	R.Difusora, Taubate	Brazil	0045	B
3.915	BBC Kranji	Singapore	2120	G,J,L,R	4.935	Voice of Kenya	Kenya	1941	L,O
3.945	AIR Gorakhpur	India	1523	G	4.940	R.Abdijan	Ivory Coast	1945	B
3.945	Vatican Radio	Italy	1950	K,L	4.955	R.Marajoara, Belem	Brazil	2340	B,F
3.950	Qinghai PBS, Xining	China	2345	B	4.960	Mulenvos	Angola	1940	O
3.955	BBC Skelton	England	2124	G,L	4.960	R. La Merced	Peru	0045	B
3.955	R.Budapest	Hungary	2100	K,L,O	4.965	R.Alvorada	Brazil	0050	B
3.955	Novosibirsk rly A.AtA	Kazakhstan	2057	C,E	4.970	PBS Xining	China	1640	G
3.960	Xinjiang PBS, Urumqi	China	2355	B	4.970	R.Rumbos, Caracas	Venezuela	0020	B
3.965	RFI Paris	France	2125	B,C,D,E,K,L,M,S	4.975	R.Uganda, Kampala	Uganda	1950	AL,O
3.970	R.Buea	Cameroon	2050	K,L	4.980	Ecos del Torbes	Venezuela	2345	B,F,K
3.980	VDA Munich	Germany	2050	B,C,J,L,M,R,S	4.990	R.Brazil Central	Brazil	2240	B
3.985	China R via SRI	Switzerland	2100	B,K,L	4.990	AIR Ext.Service	India	0030	B,D,L
3.985	SRI Beromunster	Switzerland	0610	B,C,E,K,L,M,S	5.005	FRCN Lagos	Nigeria	2110	B,L,M
3.990	Xinjiang BS, Urumqi	China	0005	B	5.009	R.Nepal, Kathmandu	Nepal	1557	G,I
3.995	DV via Jlich	Germany	2230	B,C,D,E,L	5.010	R.Madagaskara	Madagascar	1740	O
4.035	Xizang PBS, Lhasa	Tibet	0005	B	5.015	R.Garcua	Cameroon	2038	C,G,L
4.409	R.Eco, Reyes	Bolivia	0015	B	5.020	R.Brazil Tropical	Brazil	0045	B
4.500	Xinjiang BS, Urumqi	China	0100	B,L	5.021	La Voix du Sahel	Niger	1903	L,O
4.650	R.Santa Ana	Bolivia	0025	B	5.025	Hanoi	Vietnam	2208	G
4.735	Xinjiang, Urumqi	China	2330	L	5.025	R.Parakou	Benin	1914	B,L,O
4.755	R.Edu CP Grande	Brazil	0015	B	5.025	R.J.da Transamazonica	Brazil	0060	B
4.760	Yunnan PBS, Kunming	China	2253	E,G	5.025	R.Rebelde, Habana	Cuba	0120	B
4.760	AIR Port Blair	India	1721	G	5.025	R.Uganda, Kampala	Uganda	1914	A,G,M,O
4.760	TWR	Swaziland	2130	L	5.035	R.Parakou	C.Africa	1937	B,L
4.765	R.Integracao	Brazil	0015	B	5.040	Voz do Upano, Macas	Ecuador	0245	L
4.765	Brazzaville	PR.Congo	2257	E	5.045	R.Cultura do Para	Brazil	0300	B,H
4.770	FRCN Kaduna	Nigeria	2000	B,D,E,L,M,O	5.047	R.Togo, Lome	Togo	1951	B,E,L,M,O
4.775	R.Amarela	Brazil	0225	B	5.050	Voz de Yopal, Yopal	Colombia	0205	B
4.777	R.Gabon, Libreville	Gabon	1929	E,B,H,L,D	5.050	R.I.Azawl	India	0055	B
4.780	RTD	Djibouti	1950	G	5.050	R.Tanzania	Tanzania	1952	O
4.783	RTM Bamako	Mali	2021	B,C,E,K,O	5.055	RFO Cayenne/Metawu	Fr. Guiana	2245	B,L,M
4.785	Ecos do Combeima	Colombia	0030	B	5.075	Caracol Bogata	Colombia	0240	B,H,L,M
4.790	Azad Kashmir R.	Pakistan	1702	G	5.131	R.Vis. 2000 Bambamarca	Peru	0050	B
4.790	R.Atlantida	Peru	2235	B					
4.790	TWR Manzini	Swaziland	1810	G,M					
4.800	CPBS 2 Beijing	China	2301	B,G					
4.800	AIR Hyderabadi	India	1730	G,M					
4.800	LNBs Lesotho	Maseru	2046	B,G,O					
4.805	R.Nac Amazonas	Brazil	0020	B					
4.810	R.San Martin Tara	Peru	0025	B,O,L					
4.810	SABC Meyerton	S.Africa	1844	G,O					
4.815	R.Caboclo	Brazil	0030	B					
4.815	R.Difusora, Londrina	Brazil	0035	B					
4.815	R.dif TV Burkina	Guadougou	1944	B,E,O					
4.820	E.Prov.Huila	Angola	0518	L					
4.820	La Voz Evangelica	Honduras	2247	B,E					
4.820	AIR Calcutta	India	1723	G					
4.825	R.Cancau Nova	Brazil	2312	E					
4.830	R.Botswana, Gaborone	Botswana	1958	C,M,O					

## Quarterly List Of Equipment Used

LM&S for #May, #June, \*July'94.

\$- Tim Allison, Middlesbrough:	Lowe HF-225 + r.w.
\$# Ted Bardy, N.London:	JRC NRD-535D or Racal RA-1217 + 5RV or V Beam or loop.
\$# Leo Barr, Sunderland:	Sony ICF SW-7600 or Roberts RC-818 + spiral loop or r.w.
\$# Charles Beanland, Gibraltar:	Sangean ATS-803 + a.t.u. + 6m wire or Howes AA2
\$# Darren Beasley, Bridgwater:	Philips D2935 + Hex loop or a.t.u. + two 15m wires.
\$# Clive Boutell, Dovercourt:	Trio R600 + a.t.u. + half size 5RV or loop.
\$# Vera Brindley, Woodhall Spa:	Sangean ATS-803A or Sangean SW60.
\$# Kenneth Buck, Edinburgh:	Lowe HF-225 + copper tube loop.
\$# Tim Bucknall, Congleton:	Sony ICF-2001D + AN-1 or Roberts 808.
# Oliver Carr-Forster, W.London:	Sony ICF-2001.
# Noel Carrington, Sutton-in-Ashfield:	Lowe HF-225 + r.w.
# Bill Clark, Rotherham:	Sony ICF-2001D + whip or r.w.
# Kimberley Clift, Northampton:	Aiwa portable built-in whip.
# Robert Connolly, Kilkeel:	Trio R-1000 + Sony AN-1 or 30m wire.
# John Court, Birmingham:	Waltham multi-band + whip.
# Geoff Crowley, Aberdeen:	Yaesu FRG-7700 + a.t.u. + 1/2 size 5RV.
# Bernard Curtis, Stalbridge:	Tatung TMR-7602 + whip or r.w.
# Martin Dale, Stockport:	Codar CR-70A + a.t.u. + 23m wire or CapCo loop.
\$# Ron Damp, Worthing:	Racal RA17 + Hex loop or a.t.u. + Windom.
# Wilfried Derychn, Ichtegem:	Yaesu FRG-100 + Mag Balun + 15m wire.
# John Eaton, Woking:	Lowe HF-225 + Datong A270 or 23m wire.
# Jim Edwards, Wigton:	JRC NRD-535 + 30m wire.
# Peter Gordon-Smith, Kingston, Moray:	Trio R600 + inverted V dipole.
\$# Michael Griffin, Ross-on-Wye:	Icom R-72 + a.t.u. + dipole or Rhombic.
# Bill Griffith, W.London:	Lowe HF-225 + 10m wire.
\$# Alec Grimmett, Inverness:	JRC NRD-535 + 25m wire or Sony ICF-2002.
# P.R.Gunuprasad, Vellore, India:	Steepletone or Vega + r.w. or dipole.
\$# Chris Haigh, Huddersfield:	Sony ICF-7600DA + built-in whip.
# Robin Harvey, Bourne:	Drake R-8E + 20m wire.
\$# Gerry Haynes, Bushey Heath:	Matsui MR-4099 + whip.
\$# Francis Hearne, N.Bristol:	Kenwood R-5000 + Mag Balun + 40m wire or loop.
\$# Simon Hocknell, E.Bristol:	Sharp WOT370 + Sm wire.
\$# Sheila Hughes, Morden:	Roberts R-817, ITT Colt, HMV 1124 + r.w.
\$# Rhoderick Illman, Oxted:	Sony ICF-7600DS or Racal RA-17L + loops.
# Stephen Jones, Oswestry:	Kenwood R-5000 + 40m wire.
\$# Cyni Kellam, Sheffield:	Kenwood R-5000 + 40m wire.
\$# Ronald Kilgore, Co.Londonerry:	Drake R-8E + Mag Balun + 20m wire.
\$# Ross Lockley, Stirling:	Realistic DX-300 + a.t.u. + 50m dipole.
# Paul Logan, Lisnaskea:	Silver XF 900 + loop, Yaesu FRG-8800 + r.w.
# Lawrence Mason, Hassocks:	Not stated.
\$# Eddie McKeown, Co.Down:	Tatung TMR-7602.
\$# Mary McPhillips, Co.Monaghan:	Grundig Satellit 700 + AD-270 or r.w.
\$# Roy Merrill, Dunstable:	Omega 4030 or Acadamy 12 + whip or loop.
\$# George Millmore, Wootton, IoW:	Icom R-71E + 5RV or r.w.
# Albert Moore, Douglas, IoM:	Sangean ATS-803A or Racal RA-17L + loops.
# John O'Halloran, Harrogate:	Sangean ATS-803A + r.w.
# Sergei Olejnik, Kalush, Ukraine:	Yaesu FRG-100 + inverted V dipole.
\$# Fred Pallant, Storrington:	Ishim-003 + 70m wire.
# John Parry, Northwich:	Trio R-2000 + r.w. in loft.
# Roy Parwick, Derby:	Realistic DX-400 + 33m wire.
# Clair Pinder, Appleby:	Lowe HF-125 + 22m wire.
# Clare Pinder, Glasgow:	JRC NRD-525 + Yaesu FRT-7700 + 16m wire.
\$# Peter Pollard, Rugby:	Sony ICF-2001 + r.w.
\$# Fred Price, Shrewsbury:	Sony ICF-2001D + AN-1.
# Philip Ramaut, Macclesfield:	Lowe HF-150 + AD270 or r.w.
# Harry Richards, Barton-on-Humber:	Int.Marine Radio R.700M + r.w.
\$# John Sadler, Bishops Stortford:	Grundig Satellit 700 + AD-270 or r.w.
\$# Howard Seddon, Wigan:	Omega 4030 or Acadamy 12 + whip or loop.
\$# Eric Shaw, Chester:	Lowe HF-225 + 7m wire.
\$# Chris Shorten, Norwich:	Matsui MR-4099 + 10m wire.
\$# Tom Smyth, Co.Fermanagh:	Sangean ATS-803A or M.Richards R191 + whip.
# John Stevens, Largs:	Hammarlund HQ 180 or Icom R-70 + loop or r.w.
\$# Andrew Stokes, Leicester:	Blaupunkt Stereo Radiogram circa 1968.
\$# George Tebbitts, Penmaenmawr:	Lowe HF-225 + loop or r.w.
\$# Phil Townsend, London:	Philips D-8734 or Panasonic RF-506 + a.t.u. + 15m wire.
# Edward Turnbull, Gosforth:	RCA AR-88D + Hexagonal Loop.
\$# John Wells, E.Grinstead:	Kenwood R-2000 + Yaesu FRT-7700 a.t.u. + 5m wire.

Ankara 9.445 (Eng to USA 2200-2250) SIO444 at 2245 by **Francis Hearne** in N.Bristol, USA. Abu Dhabi 9.605 (Eng to NW USA 2200-0000) SIO333 at 2340 in Northampton; R.Nao del Paraguay 9.735 (Sp 0800-0400) 35553 at 0037 in Carnarvon 9.770 (Eng to Asia 1430-1630) 45434 at 1555 in Woking; BBC via Kranji 9.740 (Eng to S/SE.Asia 0900-1830) 33332 at 1700 in Chester; SNBC, Omdurman, 9.165 (Eng to Africa 1800-1900) 33443 at 1800 in Stirling; AIR via Delhi? 9.950 (Eng to N.Africa 1745-1945) SIO222 at 1800 in Co.Fermanagh; Vatican R, Italy 9.645 (Eng to Africa 2000-2030) 44333 at 2000 in Morden; Yemen R, Sana'a 9.780 (Ar to M.East 1000-2115) 23332 at 2057 by **P.Gordon Smith** in Kingston, Moray; R.Rumbos, Caracus 9.660 (Sp 24hrs) 43443 at 2200 in Kilkeel; Voice of Turkey, It, Fr to Eu 1945-2145) 33442 at 2030 in Ankara 9.445 (Eng to USA 2200-2250) SIO444 at 2245 by **Francis Hearne** in N.Bristol, USA. Abu Dhabi 9.605 (Eng to NW USA 2200-0000) SIO333 at 2340 in Northampton; R.Nao del Paraguay 9.735 (Sp 0800-0400) 35553 at 0037 in Carnarvon 9.770 (Eng to Asia 1430-1630) 45434 at 1555 in Woking; BBC via Kranji 9.740 (Eng to S/SE.Asia 0900-1830) 33332 at 1700 in Chester; SNBC, Omdurman, 9.165 (Eng to Africa 1800-1900) 33443 at 1800 in Stirling; AIR via Delhi? 9.950 (Eng to N.Africa 1745-1945) SIO222 at 1800 in Co.Fermanagh; Vatican R, Italy 9.645 (Eng to Africa 2000-2030) 44333 at 2000 in Morden; Yemen R, Sana'a 9.780 (Ar to M.East 1000-2115) 23332 at 2057 by **P.Gordon Smith** in Kingston, Moray; R.Rumbos, Caracus 9.660 (Sp 24hrs) 43443 at 2200 in Kilkeel; Voice of Turkey, It, Fr to Eu 1945-2145) 33442 at 2030 in Ankara 9.445 (Eng to USA 2200-2250) SIO444 at 2245 by **Francis Hearne** in N.Bristol, USA. Abu Dhabi 9.605 (Eng to NW USA 2200-0000) SIO333 at 2340 in Northampton; R.Nao del Paraguay 9.735 (Sp 0800-0400) 35553 at 0037 in Carnarvon 9.770 (Eng to Asia 1430-1630) 45434 at 1555 in Woking; BBC via Kranji 9.740 (Eng to S/SE.Asia 0900-1830) 33332 at 1700 in Chester; SNBC, Omdurman, 9.165 (Eng to Africa 1800-1900) 33443 at 1800 in Stirling; AIR via Delhi? 9.950 (Eng to N.Africa 1745-1945) SIO222 at 1800 in Co.Fermanagh; Vatican R, Italy 9.645 (Eng to Africa 2000-2030) 44333 at 2000 in Morden; Yemen R, Sana'a 9.780 (Ar to M.East 1000-2115) 23332 at 2057 by **P.Gordon Smith** in Kingston, Moray; R.Rumbos, Caracus 9.660 (Sp 24hrs) 43443 at 2200 in Kilkeel; Voice of Turkey, It, Fr to Eu 1945-2145) 33442 at 2030 in Ankara 9.445 (Eng to USA 2200-2250) SIO444 at 2245 by **Francis Hearne** in N.Bristol, USA. Abu Dhabi 9.605 (Eng to NW USA 2200-0000) SIO333 at 2340 in Northampton; R.Nao del Paraguay 9.735 (Sp 0800-0400) 35553 at 0037

# Off The Record

**R**eception conditions on the frequencies that many regard as the European pirate band, 6.2 - 6.4MHz, have been rather poor over the past few months, particularly during the mornings. The frequencies favoured by American pirates 7.4 - 7.5MHz have only fared a little better. Nighttime conditions in the 3.9 - 4MHz area have rendered quite good results for the few stations that turn up there on a regular basis.

Generally speaking, most of the short wave pirates target their programmes for an audience at the weekends, with advertisements for pirate radio memorabilia in the shape of books, recordings and clubs. DX programmes including news of pirate radio activity are carried by several stations (I am not allowed to say which) but needless to say Andy Walker's *Free Radio Show* is possibly the most well known. Some stations also play recordings of bye-gone pirate stations from the 60s or 70s, which can sometimes make fascinating listening.

Last quarter I became heavily inundated with mail following my offer to provide print-outs of pirate radio activity. Much as I enjoy hearing from readers, I almost reached the point of becoming a pirate radio bureau! The difficulty is that everyone wants information that the Radiocommunications Agency objects to me publishing here. Magazines printed abroad and private club newsletters would appear to escape the difficulties involved with reporting pirate station details. *Pirate Chat* is booklet that shows pirates in alphabetical order and lists frequencies and a brief history of each station, my copy has 30 pages. A sample copy is just £1 from *Pirate Chat*, PO Box 1218, Chelmsford, Essex CM1 4BD.

If you want a pirate radio address book *Pirate Connection* is ideal, details can be obtained from Kammarsvagen 13 D 220, Lund 22646, Sweden. Both of these cover pirate radio on a world-wide basis. The medium wave pirates are catered for by Derek Taylor's *Alternative Medium Wave News*, this newsletter is just 75p per copy from 12 Dorman Road, Preston, Lancs PR2 6AS.

## Land-based Pirates

The s.w. pirate Lazer Hot Hits are now making use of the relay facilities normally used by the Caroline s.w. service, reception over the May Bank Holiday was excellent. The mailing address for this station is in Ontario, Canada, and details of how to QSL are conveniently given on air. The operators of this station are

clearly experienced in short wave broadcasting.

The Pirate Freaks Broadcasting Service (PFBS) have recently replaced their Utrecht, mailing address with another elsewhere in Holland. Persons QSLing this station receive cards picturing their transmitters, there is a set of three.

Officials from the Radio Investigation Service and the Essex police recently closed down Radio Galaxy, the studio was discovered in a lock-up garage with a transmitter on the roof of some nearby flats. This pirate station became popular within the walls of Chelmsford jail where the station discovered they had a captive audience!

Another station to be raided has been the s.w. station Radio Merlin - this is not the first time officers from the DTI have made a live appearance at Radio Merlin, only for it to return a few months later.

Dutch s.w. broadcaster Orang Utan is also reported to have been raided, by the Dutch Department of Communications, they were well known in the UK because of their powerful signal and their use of the English language.

Two DJs from Wolverhampton's Frontline Radio received a conditional discharge following the forced entry of their studios by communications officials. This followed complaints of interference to mobile radio networks in the area. Several electricity and gas companies still use private mobile radio equipment that operates around 107MHz, with amplitude modulation, for mobiles and around 139MHz for their base stations. When 'talkthrough' is switched on, for car to car use, anything transmitted on 107MHz is also radiated by the repeater on 139MHz, thus interfering with a system capable of covering a radius of about 65km. This system is indeed outdated and fairly frequently suffers from interference from countries that legitimately use these frequencies for broadcasting. Because of this sensitive or emergency messages are usually sent to engineers by mobile telephone. New frequencies have in fact been allocated to these services but some organisations have yet made the move.

## Virgin 105-108MHz?

Consultations are going on within the broadcasting industry over the future development of the 105-108MHz area of this band. Basically, the choices are either for community radio, a combination of regional and local stations or another national network. The m.w. rock station Virgin 1215

have had a campaign running to persuade the authorities to give them a national f.m. circuit. This could be achieved by using the newly available frequencies, or at the expense of either BBC Radio 3 or 4. It is argued that Radio 3 is more than compensated for by Classic FM, and Radio 4 surely does not require stereo quality for a talk station. Personally I can't see the Beeb relinquishing any of their f.m. transmission facilities. Still with the continued privatisation of the broadcasting industry and the possible abandonment of TV licensing, who knows?

European Free Radio stations are being relayed on 7.125MHz by the Italian Radio Relay Service, so this could be a frequency to keep an ear on. This seems to follow the current trend of shared transmission facilities, rather similar to legitimate s.w. stations.

I received many letters following last quarters report on restricted service licensed stations. It does offer a legal option to piracy, but only on a very short term basis.

## Coming Soon

In a forthcoming 'Off The Record' I hope to look at Citizens Band radio in the UK. Following several years of illicit use, CB radio was legalised on a set of 40 channels at 27.6MHz and 20 channels on 934MHz in 1981, since then the EU have authorised the use of another 40 channels on 27MHz giving British users the theoretical use of 100 legal f.m. channels. What do you think of CB radio, its use or

## Short Wave Pirates Chart

Station	Monitors
Subterranean Sounds	B
Reflections Europe	A,E
Delta	A,G
Gloria	A
Orang Utan, (Raided)	B,E
Reflections Europe	A,B,E
Lowlands	D
WGAS	A,C,D,E,F,G
Emerald International	B,E,F
Jolly Roger	A,E,F,G
Merlin (Raided)	A,F
Britain Radio	B,E
Ozone	A,C,E,G
Level 48	B,G
East Coast Commercial	A,C,E,F,G
Pirana	A,B,G
Xenon Transmitting Co	B,E,F,G
Free Radio Holland	B,D,F
Free Radio London	B,F
Live Wire	B,E
Caroline SW	A,B,C,D,E,F,G
Lazer Hot Hits	B,C
Starclub	G
Angel (Raided)	B,C
Optimod	A,D,E
Dublin	A,E
Waves. (Closure announced)	A,E
Geronimo	B,C
Brigitte	A,B,C,E
Europe	A,B
World Communication	A

A: Free Radio Monitoring, Halesowen, W. Midlands.

B: Ian Turner, Deal, Kent.

C: Bob Marsh, Bexleyheath, Kent.

D: Connor Walsh, Wexford, Ireland.

E: Rab O'Fokel, Sunderland, Tyne & Wear.

F: David Williams, Bursledon, Southampton.

G: Dave Murphy, Sale Cheshire.

misuse and do you have any opinion on this matter?

## A Reminder

This page makes constant references to pirate broadcasts, these are reported as a guide to our hobby of s.w. listening. Clearly, it would be misleading to pretend these stations don't exist and to ignore them completely. There is no intention to encourage or assist persons engaged in unlicensed transmissions, which in the event of a conviction, can carry heavy fines, imprisonment and the confiscation of equipment.

See you on this page next quarter...bye.





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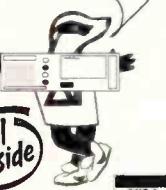


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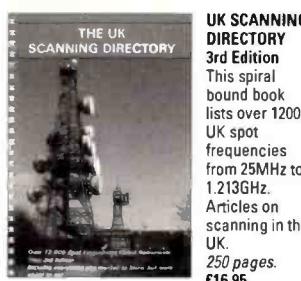
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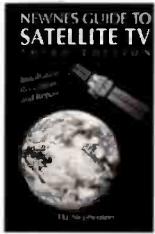
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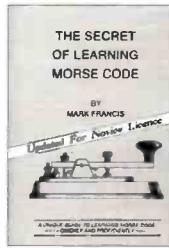
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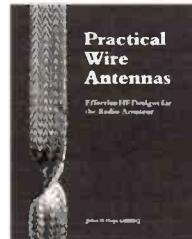
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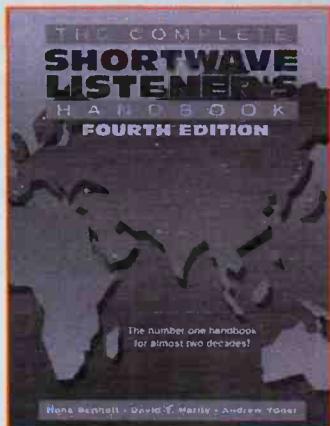
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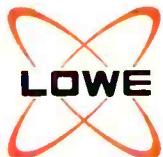
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