short wave magazine

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February 1996 £2.50 ISSN 0037 -4261

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- Automatically tunes these receivers with Reaction Tune (Pat.Pend.) CI-V receivers (ICOM's R7000, R7100, and R9000), (Pro 2005/2006 equipped with OS456, Pro 2035 equipped with OS535) or AOR models (AR2700 and AR8000).
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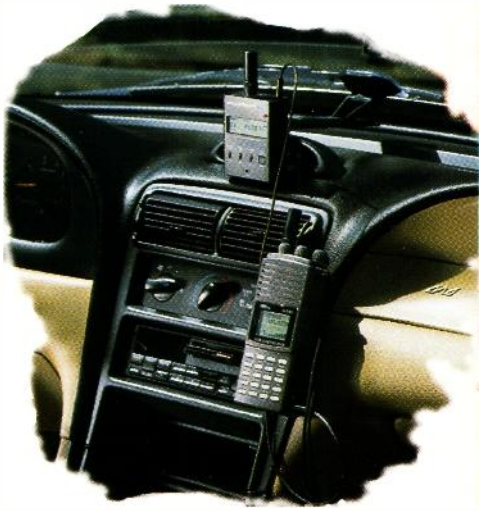

At right: Scout shown with CLIPMATE™. A handy windshield mount for Scout, for quick access and visibility.

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Simply add the forename of the person you wish to contact. For example:
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Cover Subject

The BayGen Freeplay Clockwork Radio is intended for the African continent. Perhaps it has a lesson for us all in energy conservation!

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Good Listening

SWM SERVICES

Subscriptions

Subscriptions are available at £25 per annum to UK addresses, £28 in Europe and £30 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 £42(UK) £47 (Europe) and £51 (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, 80 Clarence Road, Erdington, Birmingham B23 6AR. Tel: 0121 - 384 2473.

Photocopies and Back Issues

We have a selection of back issues, covering the past three years of SWM. If you are looking for an article or review, or whatever that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues are **£2.60** each, photocopies are also **£2.60** per article, plus **£1.00** for subsequent parts of serial articles.

Binders, each taking one volume are available for £5.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Please state the year and volume number for which the binder is required. Prices include VAT where appropriate.

Orders for back numbers, binders and items from our Book Service should be sent to: **PW Publishing Ltd., FREEPOST, Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW,** with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling.

Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Broadstone (01202) 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 (01202) 659950.

Technical Help

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

EDITORIAL

The secret is now out! A new column makes its first appearance in this issue. Jerry Glenwright will be writing a regular quarterly column on computing as applied to short wave listening.

The recent arguments conducted in the Letters column of this magazine have indicated to me that there is a need for a quarterly page devoted, not to computing, but to what the computer can do for you as a listener. Without modern, powerful computers I reckon that about 75% of the content of *SWM* would probably not exist.

So you think that you haven't got a computer in your shack? What about that scanner? What about the RTTY decoder? They all use dedicated computer technology to enable them to work. A computer was more than likely used to help design your radio, which was then probably assembled by a computer driven 'robot'. Even your favourite magazine is put together using computers.

However, don't worry that computing will be taking over the magazine. The new column is only one page every third issue and I have no plans to increase that allocation. *Short Wave Magazine* will remain **the** magzine for the listening - or watching - enthusiast for as long as I am Editor.

Dick Ganderton G8VFH

LETTERS

IF YOU HAVE ANY POINTS OF VIEW THAT YOU WANT TO AIR PLEASE WRITE TO THE EDITOR. IF YOUR LETTER US 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.*

Help Needed

Dear Sir

I'm a subscriber of *Short Wave Magazine* and radio collector. I would like to have your help to find a copy (or photocopy) of the *Owner's Service Manual* for the National Panasonic RF-8000. My set does not work and I would like to repair it.

I will pay the cost of replies.

Sabino Fina
Avellino
Italy

Dear Sir

Some months ago I wrote a letter to you, which was published (thank you!) in the May '95 edition. Unfortunately, I had to move almost at the same time, so I had no feed back, (different 'phone no. as well). I am now living near Tokyo (not in Tokyo) and my 'phone number has changed. I can be contacted on Tel/FAX: + 81-429-39-5942.

I'm French and am a keen short wave listener. Unfortunately, there are only a few non-Japanese s.w.l.s in Japan. I would like any other English, French or German speaking s.w.l.s in Japan to contact me on my new telephone/FAX number.

F. Collin
Japan

Secret Lists

Dear Sir

Re: The use of scanners and the frequencies one may or may not listen to. Various sources are offering lists of 'secret', 'classified' or 'prohibited' frequencies. They cannot be 'secret', etc. any longer if they are available for a payment!

If they are supposed to be 'prohibited', etc. then they obviously, by definition, are not. Why aren't the purveyors of such lists prosecuted?

Anyway, I think I could claim to legally listen to all and sundry transmissions. I was a Merchant Navy Radio Officer and after I passed the exam but before I was issued with my 'ticket', I had to sign a form to the effect that I would "preserve the secrecy of correspondence".

Also, during the War, when I had access to the Merchant Navy codes and de-coding tables, I had to sign the Official Secrets Act, so, does that put me in the clear?

A.J. Long
Cambridge

LETTERS

Sony Receiver Coverage

Dear Sir
For any of your readers who own a Sony ICF-2001D and who would like to scan the entire receiver overage or to scan from a particular frequency or from a memorised h.f. frequency, may I suggest that they try the following:

Enter h.f. frequency in A1 (say 150.0kHz)
Enter Air frequency in A2 (say 116MHz)
Hold down shift key and press define key (150.0kHz appears in display)
Press scan (scan starts from 150.0kHz)
Press scan to stop and enter a frequency say 11100.0kHz and press execute
Press scan (scan starts from 11100.0kHz
Press scan to stop and press any memory button containing h.f. frequency
Press scan (scan starts from the memorised frequency)

If f.m. and airband scan are not required, then press scan to stop and return to h.f. scan, hold down the shift and press define (150.0kHz appears in display). Similarly, if broadcast band has been used, hold down the shift and press define to return to h.f. scan.

PS. The above procedure is not mentioned in the Receiver Handbook. It is the result of my trying to find a way to scan the entire Receiver coverage.

Len Woolley
Bude
Cornwall

Trawling LM&S

Dear Sir
I have just bought my January 1996 issue of *SWM* and had to put digits to keyboard to respond to Mr. Preston's letter. I am one of those dull souls who 'trawl' through LM&S; in fact this was the main reason I first bought *SWM* a few years ago, after a twenty year break from the hobby. I wanted to see what was going on.

I am mainly a broadcast band s.w.l.er and sometimes a DXer and normally go straight for LM&S when I pick up *SWM*, but I also read some, or all of the many other areas covered by the magazine. Maybe one day I will become involved with RTTY or FAX, or something. I hope that Mr. Preston might understand that it is not beyond most people to consider developing their interest from an initial attraction to one area of electronic communications, into the many exciting other possibilities. If they do wish to do this, then I think that *SWM* is a good 'way in'.

On another matter, has any readers had any problems with the Sony SW100? I have just paid a repair bill for £80 - the radio only cost £189 - for new key pads that Sony say are worn out. This is after only 14 months and about 100 hours of use. My 2001D is five years old and must have thousands of hours on the clock, with no problems. Maybe they don't make them like they used to.

Ray Mowll
Brentwood

*Any readers out there with worn out SW100 keypads? If so let us know. **Ed***

Reviews

Dear Sir
What a refreshing article by John Wilson. It's nice to see that an author can still see the good as well as the bad in a product and make a comparison between different manufacturers.

The main reason I started buying *SWM* was to get some impartial advice on what equipment to buy - unfortunately all of your recent reviews simply stated what a joy each unit was to use and how the author didn't want to give it back, followed by the specification from the handbook.

Personally I would prefer to see a head-to-head comparison between different radios - pointing out the good and bad points of each. Then a final personal choice from the reviewer.

What is wrong with stating that the latest 'XYZ' is not really worth the money, or that the manufacturer has got it wrong. Motorcycle magazines do it all the time! I often get the impression that radio magazines are afraid of losing valuable advertising revenue if they give a bad review!

Individuals do not have the resources to do comparative tests, that is what I hoped to get from an impartial magazine.

David Cripps G7IDB
South London

I am sorry that you think that our reviews are not informative enough for you. If the reviewer thought that the set under review was the best thing since sliced bread and that he really would like one himself what do I do - wield the blue pencil and cut it out?

Testing a radio is, I would say, more difficult than testing a car or motorcycle. What do you do if the conditions are so bad that nothing is there to be heard? What if you happen to be in the only radio 'black hole' around that day? If a car or motorcycle is bad then you find out pretty quickly - if you live to write the review! Head-to-head reviews are not easy to do unless you have an unlimited Editorial Budget. Many suppliers in the radio business have a very limited number of sets to loan to the likes of SWM for solo reviews, let alone comparative ones.

*However, I do take notice of what my readers tell me and will bear your comments in mind for future reviews. **Ed.***

Internet

Dear Sir
I read with interest the letter from Ben Ramsden (Letters, *SWM* November) who disagrees with me regarding the inclusion of computer articles in *SWM*. He then goes on to suggest that an article on the Internet would be appropriate.

No doubt your readers will correct me if I am wrong, but I always thought that the Internet is nothing more than a computer connected to a telephone line, and if this is so, then what on earth has this to do with short wave listening and more to the point, isn't even radio.

If Mr Ramsden wants to know more about the Internet, may I suggest that he buys a magazine which explains this, and not make suggestions that have no relevance to *Short Wave Magazine*'s remit.

Harold McIntyre G3FLJ
Southampton
Hampshire

Leaking Batteries

Dear Sir
Having returned leaking batteries on three occasions to a well-known manufacturer, I would be more than interested to understand why they wish to examine/repair if necessary, my three radios, all of which are working satisfactorily One is a Philips D2999, another an Indesit R15 plus a Pye TR1720.

Surely it's the batteries leaking, not the radios! If any *SWM* readers know the answer.....

G. Fry
Freshwater
Isle of Wight

Remote Meter Reading

Dear Sir
I know we all take very seriously the problem of our radios injecting an r.f. signal onto domestic mains electricity. I've seen in numerous *SWM* and *PWs* hints for reducing this by wrapping mains cables around ferrite rods or looping the cable around ferrite rings. Those lucky enough to own delicate hi-fi systems even claim that dirty mains affects their listening enjoyment. I'm concerned about possible effects entering our equipment the other way.

As the Electricity Industry approaches its major restructuring in 1998, companies are racing to find innovative ways to read electricity meters, without using staff to read them. Since I could, in theory, be buying my electricity from Manweb when I lived in Romford, Manweb will need to have my meter reading in order to bill me correctly. I cannot conceive of a chap jumping into a van in Runcorn to visit me! Some form of remote reading therefore seems likely.

There have been proposals to use low power radio devices and even to send a signal down the mains, modulated onto the 50Hz to an intelligent, individually addressable meter. I realise that the 'interrogating signal must be at a much lower frequency than 50Hz but I don't know enough electronics to work out whether I should be worried or not. Can anyone shed some light on this topic for me, please?

Dave Taskis
Romford

Is there something you want to get off your chest? Do you have a problem fellow readers can solve? If so then drop a line to the Editor.

GRASSROOTS

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

* Short Wave Magazine & Practical Wireless in attendance

rallies

February 4: The 11th South Essex Amateur Radio Society Radio Rally is to be held at the Paddocks, Long Road, Canvey Island, Essex. The paddocks is situated at the end of the A130. Doors open at 10.30am - features: amateur radio, computer and electronic component exhibitors, Bring & Buy, RSGB Morse testing on demand (two passport photos required), home-made refreshments, free car parking with space outside main doors for disabled visitors. Admission is £1. Further details from **David G4UVJ** on **(01268) 697978**.

February 11: The Northern Cross Rally is to be held at a new and better venue, the Thornes Park Athletics Stadium, Wakefield, just out of town on the Horbury Road. Easy access from M1 junc. 39 & 40 - well signposted and with a talk-in on 2m and 70cm. Doors open at 11am (10.30am for disabled visitors and Bring & Buy). Details from **Dave G0FLX** on **0113-238 3622**.

February 17: Computer Fair's (Northern) computer/rally fair and games fair is to be held at the G. H. Carnall Leisure Centre, Lostock Road, Davyhulme, Manchester, immediately at J4 off the M63 motorway. Doors open 10am to 3pm. The show is open to traders of both computer and radio backgrounds alike. There is easy access for disabled visitors and a massive free car park, cafe and bar. Admission is £1.50 for adults, first 400 + free £2.25 mag or CD. **0161-627 2502.**

February 24: The Rainham Radio Rally is to be held at the Rainham School for Girls, Derwent Way, Rainham, Gillingham, Kent. Talk-in on S22 by GB4RRR. Doors open at 10am to 3.30pm. Disabled and wheelchair users from 9.30am. Admission is only £1.50, under 14s, free. There will be the usual mix of trade stands, Bring & Buy, many special interest groups, etc. There's plenty of off road parking, a licensed bar, food and refreshments available with an area to sit and eat and watch the world go by. Further details from **Martin G7JBO** on **(01634) 365980**.

February 25: The Barry Amateur Radio Society are holding their annual Radio and Computer Rally at the Barry Leisure Centre, Barry. Doors open at 10.30am (10am for disabled visitors). More information can be obtained from **Brian Brown GW0PUP** on **(01222) 832253**.

March 2: The 3rd West Wales Amateur Radio and Computer Rally is being held at a new venue - the Penparcau School, Aberystwyth, near new Safeways complex. Doors open at 11am and there is ample free car parking. Easy access all on one level. Snack bar. Admission is £1. There will be trade stalls, special interest groups, Bring & Buy, Repeater Groups, DX Cluster Group, Computers, Demonstrations, HF & VHF stations on the air, Packet radio and lots more the radio amateur and computer hobbyist. Talk-in on S22. Best in the West. Details or trade enquiries from **Katy GW0SFO, QTHR** on **(01545) 580675**.

***March 9/10:** The London Amateur Radio & Computer Show is to be held at the Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London N9. Doors open 10am to 5pm each day. There will be trade shows, lectures, a Bring & Buy, on-demand Morse tests (two photos needed), talk-in on 2m and 70cm, disabled facilities, priority admission for disabled visitors, bars, restaurants and ample free parking. **Steve White G3ZVW** on **0181-882 5125**.

March 10: Wythall Radio Club will be holding their annual radio rally at Wythall Park, Silver Street, Wythall (near Birmingham on the A435, two miles from junction 3 on the M42). Doors open 10.30am to 4pm. There will be all the usual traders in three halls and a marquee. Bar and refreshment facilities will be available. In addition there will be a Bring & Buy stall run by the club. Talk-in on S22. Admission only £1. **Chris G0EYO** on **0121-430 7267**.

March 17: The largest single day amateur radio rally in the UK - the Norbreck Radio, Electronics and Computing Exhibition by the Northern Amateur Radio Societies Association at the Norbreck Castle Hotel Exhibition Centre, Queens Promenade, North Shore, Blackpool. Doors open at 11am (10.45am for disabled visitors). Over 100 trade stands, Bring & Buy stand, RSGB stand and book stall, club stands, amateur computer stands, construction competition, free car parking, free shuttle bus from car park, wheelchair access to all stands, radio talk-in on S22. Admission is £2, OAPs £1 and under 14s free. More information obtained from **Peter Denton G6CGF** on **0151-630 5790**.

March 24: Bournemouth Radio Society's 9th Annual Sale will be held at Kinson Community Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth. Doors open at 10.30am until 4.30pm. Talk-in from G1BRS on 2m S22. Amateur radio, computer traders, clubs and specialised groups. Excellent refreshments. Admission £1. Details from **Malcolm G0UCX, QTHR** on **(01252) 845900**.

March 24: Pontefract & District Amateur Radio Society Annual Radio Rally & Components Fair. Details from **Colin Wilkinson G0NQE** on **(01977) 677006**.

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

***Bristol International RC:** Tuesdays, 8pm. The Fighting Cocks Public House, Hengrove. All visitors are welcome. The club has been formed so that all radio enthusiasts, whether they be Licensed Amateurs, s.w.l.s or CBers can get together and have a good natter and do things that you do in radio clubs. PO Box 28, Bristol BS99 1GL.

***RSGB City of Bristol Group:** last Tuesdays, 7pm. New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. January 30 - Incidents, not accidents by John Walker. Dave Bailey G4NKT. 0117-967 2124.

Shirehampton ARC: Fridays. Ron Ford G4GTD. 0117-977 0504.

***South Bristol ARC:** Wednesdays, 7.30pm. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. January 31 - Video evening 'Building The Matthew, Cabots Boat' by G0AWX, February 7 - 10m activity evening - committee meeting, 14th - Valentines Day power supply construction, 21st - Aircraft magazine evening. For more information ring (01275) 834282 on a Wednesday evening.

BEDFORDSHIRE

Shefford & DARS: Thursdays, 8pm. Church Hall, Ampthill Road, Shefford, Bedfordshire. Paul G1GSN. (01462) 700618.

BERKSHIRE

Maidenhead & DARC: 8pm, The Red Cross Hall, The Crescent, Maidenhead. Neil Savin G0SVN. (01628) 25952.

BUCKINGHAMSHIRE

***Aylesbury Vale RS:** Wednesday evenings, 8pm. Hardwick Village Hall, (Hardwick is situated off the A413 between Aylesbury and Buckingham). February 7 - Operating techniques by Ivan Eamus G3KLT. Ivan Eamus G3KLT. (01296) 437720.

CENTRAL REGION

Stirling & DARS: Thursdays, 7.30pm. The Clubrooms, Bandeath Industrial Estate, Throsk, Nr Stirling. Brian Mulleady GM0KWL. (01324) 636235.

Dollar Academy ARC: The club meets most afternoons at the Academy after 3.30pm. Geoff Collier GM0LOD, Tait House, Academy Place, Dollar FK14 4JF. (01259) 742126.

CLWYD

***Conwy Valley ARC:** 1st Wednesdays, The Studio, Penrhos Road, Colwyn Bay, Clwyd. February 7 - An evening with Prof. David Last GW3MZY - the subject is the speaker's choice. R. W. Evans GW6PMC (01745) 855068.

CORNWALL

Saltash & DARC: 1st and 3rd Fridays at 7.30pm. The Burraton Toc H Hall, Saltash. Brian G7SSH on (01752) 844321 evenings.

DERBYSHIRE

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. Richard Buckby G3VGW, 20 Eden Bank, Ambergate, Belper, Derbyshire DE56 2GG. (01773) 852475.

South Normanton & Alfreton DARC: The Community Centre, New Street, South Normanton, Derbyshire. Helen Coleyshaw 2E1AWJ (01332) 881549.

DEVON

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

***Plymouth RC:** Tuesdays, 7.30pm. The Royal Fleet Club, Devonport, Plymouth. January 27 - Plymouth Radio Club annual dinner and dance, 30th - Internet demonstration by Mark Jeffs G7LJN, February 8 - Committee meeting, 13th - Business meeting and natter night. F. P. Russell on (01752) 563222.

***Torbay ARS:** Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. February 16 - AGM. Peter G4UTO. (01803) 864528.

DORSET

Blackmore Vale ARS: 2nd & 4th Tuesdays, 8pm. Shaftesbury School, Dorset. Stuart G7JIF (01953) 814055.

Dorset Police ARS: 1st & 3rd Thursdays at Force HQ at 7.30pm. (01202) 229351.

DYFED

Abererystwyth & DARS: 2nd Thursdays, 8pm. Scout Hut, Plascrug Avenue, Aberystwyth. Katy GW0SFO. (01545) 580675.

EAST SUSSEX

Hastings Electronics & RC: 3rd Wednesdays, 7.45pm. West Hill Community Centre, Croft Road, Hastings. G3YYF on (01424) 830454.

Southdown ARS: First Monday of the month, The Chaseley Home for Disabled Ex-Servicemen, Bolsover Road, Eastbourne, 7.30pm. Vic Robins G0THX on (01323) 846774 or John Vaughan G3DQY on (01323) 485704.

EDINBURGH

Lothians RS: 2nd & 4th Wednesdays, 7.30pm. Orwell Lodge Hotel, Polworth Terrace, Edinburgh. GM4DIJ, QTHR on 0131-337 7311.

ESSEX

Vange ARS: Thursdays 8pm. Barnstable Community Centre, Long Riding, Basildon, Essex. Doris. (01268) 552606.

FIFE

***Dunfermline & DARC:** Thursdays, 7.30pm. The former RAF radio station, Outh Muir, located by the A823 Dunfermline to Cnef Road, one mile from the Knockhill Racing Circuit. January 25 - Natter night, February 1 - HF operating evening, 8th - Natter night, 15th - HF operating evening, 22nd - Shack tidy, (it's been a while since the last one!). Adrian Donaldson GM0SRD on (01383) 735967.

GRAMPIAN REGION

Aberdeen ARS: Fridays, 8pm. RC Hall, 70 Cairngorn Crescent, Kincorth. Martin GM0JCN. (01569) 731177.

GREATER LONDON

Acton, Brentford & Chiswick RC: 3rd Tuesdays, 7.30pm. Chiswick Town Hall, Heathfield Terrace, Chiswick W4. Colm on 0181-749 9972.

Crystal Palace & DRC: 3rd Saturdays, 7.30pm. All Saints Church Parish Rooms, Beulah Hill, London SE19. Wilf G3DSC on 0181-699 5732 or Bob on (01737) 552170.

***Edgeware & DRS:** Thursdays, 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak. January 25 - Informal meeting (pay your subs!). Rod Bishop. 0181-204 1868.

***Southgate ARC:** 2nd & 3rd Thursdays, 7.30pm. The Pavilion, Winchmore Hill Cricket Club, Firs Lane, Winchmore Hill, London N21 3ER. January 25 - Radio on the air, London Amateur Radio Show prebrief, February 22 - Radio on the air. M. E. Viney G0ANN. (01707) 850146.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road SW19. (01737) 351313.

HAMPSHIRE

Andover ARC: 1st & 3rd Tuesdays, Wildhern Village Hall, Hants. RAE classes each meeting at 7pm. G8ALR on (01264) 773547 evenings.

Fareham & DARC: Wednesday at 7.30pm. Portchester Community Centre, Portchester, Hants. (01730) 829206.

***Horndean & DARC:** 1st & 4th Tuesdays, 7.30pm. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. February 6 - Natter night. S. Swain (01705) 472846.

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

Winchester ARC: 3rd Fridays, Red Cross Centre, Durngate House, North Walls, Winchester. 7.30pm. P. Simpkins G3MCL. (01962) 865814.

HEREFORD & WORCESTER

***Bromsgrove ARS:** 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. February 13 - Technical topics from *RadCom*/video evening. Barry Taylor. (01527) 542266.

Droitwich Spa ARC: 1st Tuesday, 8pm. Droitwich Community Hall. Many interesting evenings already booked. Jenny Read on (01905) 771571.

HERTFORDSHIRE

Dacorum AR & TS: 1st (informal) & 3rd (formal) Tuesdays, 8pm. The Heath Park, Cotterells, Hemel Hempstead. Mr D. Boast, 8 Juniper Green, Warners End, Hemel Hempstead HP1 2NQ

***Harpenden ARC:** 1st Thursday of the month from September to May, at Aldwickbury School, Harpenden February 8 - Annual dinner. Further details from Peter 2E1BDB on (01727) 860631 or John G4JOV on (01582) 765821.

Hoddesdon RC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. Dave G1CAY on (01992) 460841.

KENT

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

Hilderstone RS: Fridays, 7.30pm. Hilderstone College, St Peters Road, Broadstairs, Kent CT10 2AQ. (01843) 869812.

Maidstone YMCA ARS: Fridays, 8pm. YMCA Sports Centre, Melrose Close, Maidstone, Kent, ME15 6BD. (01622) 743317.

***Medway AR & TS:** Fridays, 7.30pm. Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham, Kent. February 9 - Writing and publishing a textbook for the RAE by Ray Petri G0OAT. G3VUN, 40 Linwood Avenue, Strood, Rochester, Kent ME2 3TR. (01634) 710023.

West Kent ARS: 1st & 3rd Fridays. The School Annex, Camden Road, Tunbridge Wells. John Taylor G3OHV on (01892) 664960.

LANCASHIRE

Bury RS: Tuesdays, 8pm. The Mosses Centre, Cecil Street, Bury. Laurence G4KLT. 0161-762 9308.

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

Preston ARS: Thursdays, 8pm. The Lonsdale Sports & Social Club, Fulwood Hall Lane, Fulwood, Preston. Eric Eastwood G1WCQ. (01772) 686708.

Rochdale & DARS: Mondays, 8pm. Cemetry Hotel, 470 Bury Road, Rochdale. Non-members always welcome. G7OAL on (01706) 376204.

LINCOLNSHIRE

Lincoln SW Club: Wednesdays, 8pm. City Engineer's Club, Waterside South, Lincoln. (01427) 788356.

Spalding & DARS: Fridays, Club Room, Old Fire Station, Spalding. G4OO, QTHR. (01775) 750382.

MERSEYSIDE

Sefton ARC: 1st & 3rd Thursdays at The Liverpool Prison Officers' Club. Details from Phil Taylor G4KLN on 0151-531 0991 or G8YPL, QTHR.

Wirral ARS: 1st & 3rd Wednesdays at Ivy Farm, Arrowe Park, Birkenhead, Wirral. Informal natter nights on each Tuesday. A. Seed G3FOO on 0151-644 6094.

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. January 31 - Night on the air/construction QRP/Morse practice, February 7 - Surplus PMR conversion by Steve G0UYA, 14th - Night on the air/construction QRP/Morse practice. Mike G4EOL. (01603) 789792.

NORTHANTS

Kettering & DARS: Tuesdays, 7.30pm. The Electricity Board Sports & Social Club, Eskdaill St., Kettering. C. P. Bourne G4RPG. (01536) 523230.

NOTTINGHAMSHIRE

***Mansfield ARS:** 2nd Mondays, 7.30pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. Mick G0UYQ, QTHR on (01623) 792243 or Howard G1JGY, QTHR, (01623) 423697.

South Notts ARC: Fridays, 7pm. The Highbank Community Centre or Fairham Community College, Farnborough Road, Clifton Estate, Nottingham. Julie Brown G0SOU. (01509) 672734.

OXFORD

***Oxford & DARS:** 2nd and 4th Thursdays, 7.30pm. The Grove House Club, Grove Street, off Banbury Road, Summertown, Oxford. D.A. Walker G3BLS on (01865) 247311.

***Vale of White Horse:** 1st Tuesday of each month. 8pm at The Fox, Steventon. Ian White. (01235) 531559.

SHROPSHIRE

***Salop ARS:** Thursdays, 8pm. Oak Hotel, Shrewsbury. February 1 - Surplus equipment sale, a chance for our successful RAEists to buy a first radio or a chance to sell your equipment that is too good for the junk sale, 15th - Know your locator? Well, if not, this is your chance to find out how to work it. Ian Davies G7SBD, QTHR. (01743) 463711.

SOMERSET

Wincanton ARC: 1st & 3rd Mondays, 7.30pm. The Community Lounge, King Arthur's Community School, Wincanton, Somerset BA9 9BX. Dave G3ZXX on (01963) 34360 or Andy G1FPW on (01747) 51381.

***Yeovil ARC:** Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. January 25 - Club station on the air and committee meeting, February 1 - The first transatlantic test by G3MYM, 8th - Flint stone radio, the practical side by G7LNJ, 15th - Surplus equipment sale, auctioneer G3PCJ, 22nd - Adapting the Pitney receiver for d.f. by G3GC. Cedric White, QTHR. (01258) 473845.

STRATHCLYDE

Milton of Campsie ARS: 2nd Wednesdays, 7.30pm. Milton of Campsie Community Hall. Alan Foulis GM7PGT on 0141-779 1444.

SUFFOLK

Bury St. Edmunds ARS: 3rd Tuesdays, 7.30 for 8pm. Culford School. Kevin Waterson G1VGI, 20 Cadogan Road, Bury St. Edmunds, Suffolk IP33 3QJ. (01284) 764804.

Haverhill & DRC: 2nd Mondays, 7.30pm. Samuel Ward Upper School, Chalkstone Way, Haverhill. Rob Proctor G4PZW. (01440) 704637.

JUNIOR LISTENER

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

Mailbag Radio!

Whilst browsing the Internet the other day I came across an interesting article in the North American Short Wave Association's regular on-line journal. The article focused on the appeal of getting involved with what have become known as mailbag programmemes. These are programmemes that deal mainly with listeners letters. Some deal with music requests, whilst others answer readers queries on a wide range of topics. The thrill of hearing your letter read out on a distant radio station is nearly as good as seeing your name in *SWM*! In amongst the host of mailbag programmes a few are worth of special note. Probably the one with the most air time is Monitor Radio International's *Letterbox*. This programmeme is on air at 0049UTC for half an hour from Tuesday through to Friday. A little closer to home is the new Radio Netherlands programme, *Sincerely Yours*. The programme is hosted by Pete Myers and answers listener's queries about Radio Netherlands. The format has been very well received and tackles a wide range of diverse topics. HCJB has been a popular choice for many listeners and they too have a couple of mailbag programmes. *Musical Mailbag* goes out every Saturday and is a very informal chat and music show that deals with readers letters. The second offering, *Saludos Amigos* hosted by Ken MacHarg runs every Sunday and offers a more detailed response to listeners' letters. If you've had any of your letters read out on-air or have a favourite mailbag programme please drop me a note with the details. In the meantime here's a few regular international mailbag programmes.

Day	Time (UTC)	Station	Programme
Thur	0010	RadioPrague	*Calling All Listeners*
Sun	0030	HCJB	*Musical Mailbag*
Mon	0030	Radio Sweden	*In Touch With Sweden*
Mon-Wed	0040	Radio China	*Listener's Letterbox*
Tue-Fri	0049	Monitor Radio	*Letterbox*
Mon	0109	HCJB	*Saludos Amigos*
Mon	0110	Deutsche Welle	*Mailbag*
Mon	0130	Radio Canada	*The Mailbag*
Sun	1245	Radio France	*Club 9516*
Mon	0145	BBC	*Write On*

Junior Listener

You will have often seen me mentioning the various short wave listening clubs that exist and writing about the benefits of joining. I received the November and December issues of *Monitor*, the magazine of the International Short Wave League and whilst reading through noticed something of even better value. ISWL members can get discounts with firms such as Coastal Communications, Nevada and Waters & Stanton. So that could give you another reason for joining up. 1996 is also the 50th anniversary year for the ISWL and they are hoping to increase membership this year. Keep a listen out for the callsign GB50SWL that will be activated each month by a different member. All QSLs for this station should be sent to: **Dave Beale, Kenwood, London Road, Louth, Lincolnshire LN11 8QH**. Due to League elections, the contact name and address have changed. You should address your letters to: **Maggie Carrington, 3 Bromyard Drive, Chellaston, Derby DE73 1PF**. Evelyn May, who has done a marvellous job for the last few years has been elected as President of the League.

HCJB

I received a letter from Lawrence Mason pointing out that due to the publishing deadlines things can change from the time I write about them and the time you read them. Lawrence has been listening to HCJB and heard it announced on *DX Partyline* that from January 1 the evening frequency of 15.540MHz will change to 11.960MHz and be from 1900-2200UTC. Thanks for the up-date Lawrence, keeping topics up-to-date is a big problem for magazines like *SWM* (and they have some of the shortest deadlines around!).

Meet The RSGB

Many listeners don't believe that the RSGB is worth joining as it's 'only for licensed amateurs'. That's not strictly true, the RSGB have got a lot to offer the listener and one way to find out is to go and meet them.

Now, they are open every week-day from 9.15am and 5.15pm, but that doesn't necessarily help if you are at work or school. Last year, the RSGB started opening the headquarters on the 3rd Saturday of each month between 10am and 4pm. The bookshop, museum, library and GB3RS shack will be available to visitors and I believe you can take Morse tests between 11am and 12.30pm.This is a really good way of seeing how the Society works and would give anyone thinking of taking their amateur licence, whether the Novice one or not, a chance to chat about what's involved. Whilst talking about the Novice licence I could tell you that three new Senior Novice Licence Instructors have been appointed for Cheshire, Somerset and Wiltshire. A Senior Novice Licence Instructor holds details of all the Novice courses in their locality and co-ordinate the work of the instructors. So if you are thinking about heading into amateur radio, these senior instructors are the place to start. A full list of these Senior Novice Instructors is available from the RSGB HQ (something you could pick up should you decide to visit).The three new names are: **Gordon Adams G3LEQ, 2 Ash Grove, Knutsford, Cheshire WA16 8BB. Tel: 01565 634040. George Davis G3ICO, Broadview, East Lanes, Mudford, Yeovil, Somerset BA21 5SP. Tel: 01935 25669. Noel Woolrych G4TIX, 20 Meadow Drive, Devizes, Wiltshire SN10 3BJ. Tel: 01380 724533.**

Readers' Letters

It took a letter from his pen pal Geoff Storchan KB8UUM to get James Stevens back listening to the amateur bands. James is hoping to hear Geoff one day whilst he's listening on the bands. His log makes interesting reading too.

A7GMC	1246	14.265	5/9	Qatar
CT3FT	1148	14.200	6/9	Madeira Islands
D44BC	1312	18.1412	3/9	Cape Verde Islands
EA6BH	1329	14.203	6/9	Balearic Islands
J3DON	1330	18.101	5/9	Grenada
K4IK7	1528	14.178	7/9	USA
KN4E4	1255	14.209	6/9	USA
LA8KH (QRP 10W)	2255	3.7980	4/9	Norway
PY1QA	1303	14.188	5/9	Brazil
VE1AT	1555	14.192	7/9	Canada
VE3SE	1254	14.187	5/9	Canada
W1UKC	1310	14.188	6/9	USA

James uses the popular Sangean ATS-803A with a 30m piece of wire in the loft, he's about to start using the Howes CTU8 a.t.u. He asks one question, once you get a Class A Novice Licence, what bands can you use? A quick trip to the RSGB Internet site (it's amazing what new technology can do!!) and the answer was revealed. Once you've got your Novice A Licence you can use: 1.950-2.000MHz 3.560-3.585MHz 10.13-10.14MHz 21.100-21.149MHz 28.060-28.190MHz 28.225-28.500MHz 50.0-52.0MHz 432-440MHz 1240-1325MHz 10000-10500MHz This gives a Novice access to some popular bands and so there shouldn't be a shortage of people to talk to.

COMMUNIQUÉ

Put off by Postage

As we are all aware in these days of continuing ression and slow growth in many countries around the World, both s.w.l.s and international broadcasters have to be careful with money they have to spend. Even major stations like VOA and the BBC are being forced to cut-back due to shrinking budgets.
In an effort to provide both broadcasters and listeners alike with the opportunity for more for their limited financial resources a project was initiated last year by **Marbian Productions International**. The Canadian based organisation is offering, for the price of sending a postcard request to them, a **free** selection of current short wave station programme schedules from around the world. Send your request to:
Marbian Productions International, PO Box 1051, Pointe Claire, Quebec, Canada H9S 4H9. Fax: +1 514 697 2615.

Monitor the Race

The Rothmans Cape-to-Rio yacht race was due to start at 1300UTC on Saturday 6 January 1996. The 5600km race, from Cape Town, which must go around Ilha da Trindade off the Brazilian coast, then on to Rio de Janeiro, has drawn 60+ entries. The fastest elapsed time for past races has been 15 days, and the maximum time allowed is 35 days. The participants will be just in time for the Rio Carnival!

During the last race in 1993, considerable activity was observed during the race on Cape Town Radio's frequencies, with the waiting list at times as high as 15, for yachts wanting to do 'phone patches to families, or to report positions. Most activity happened around 1600 to 1900UTC, with a smaller peak around 0400 to 0700UTC.

This year the situation might be slightly different, and at present, it can only be speculated about what form the radio communications might take. Telkom Maritime Services, the company which is operating Cape Town Radio, is also sending along a vessel named *Telkom Maritime*. This vessel will have three radio operators on board, and they will handle the (official?) telecomms for the race. Most definitely communication between the yachts and *Telkom Maritime* will be u.s.b. It is not known whether the latter vessel will also be in u.s.b. contact with Cape Town Radio simultaneously - we'll just have to see. Still expect that at least some yachts will still contact Cape Town Radio directly...

If you want to learn more about the race itself, past history, the fleet taking part, etc., you should visit the

URL: http://www.rothmans.co.za/
This item courtesy of the WUN mailing list.

Cape Town Radio's u.s.b. frequencies for voice traffic:

Calling Channel	Ship	ZSC
421	4.125	4.417
821	8.255	8.779
1221	12.290	13.137
1621	16.420	17.302

Working Channel	Ship	ZSC
405	4.077	4.369
801	8.195	4.719
803	8.201	8.725
805	8.207	8.731
1209	12.254	13.101
1608	16.381	17.263
1633	16.456	17.338

ISWL-Golden Jubilee 1946-96

This year marks the 50th anniversary of the formation of the International

Short Wave League. The ISWL will, as part of their Golden Jubilee Celebration, be operating the special event station with the callsign GB50SWL. The station will be operated throughout the year of 1996.

Anyone either hearing or working the station will be entitled to receive a special GB50SWL QSL card.

The station can QSLed via the Bureau or direct to:
David Beale G0DBX, Kenwood, London Road, Louth, Lincolnshire LN11 8QH.

Short Range Site Comms

The Radiocommunications Agency's - SRBR (Short Range Business Radio Service) is due to be launched early this year.

Aimed at small business and first time business radio users, for construction sites, hotels, retails complexes, warehouses, etc. the system allows speech and paging services with a range of about 0.5km.

The scheme will allow the user to utilise their own equipment with out restrictions on portability or location, throughout Britain.

The easier availability of simple, entry-level communications equipment was welcomed as an aid to small business efficiency by Science and Technology Minister Ian Taylor.

A single licence is required for the use of either speech or paging or both on SRBR radio channels (around 49 and 461MHz). The licence fee is £30 for a three year period, this allows use anywhere in England, Scotland and Wales.

Details will be published early this year, enquiries to:

Christine Morgan, Radiocommunications Agency, South Quay Three, 189 Marsh Wall, London E14 9SX. Tel: 0171-211 0280.

Radio & TVDX News

Spain's efforts at blocking the Gibraltar economy - in attempts to gain sovereignty of the 'Rock' - have failed recently over the installation of two satellite earth stations for ASC and GE Satellite International. Already problems exist with the mobile 'phone GSM network (350 code), at this time GSM users find Spanish lines 'dead', though other countries, OK. The ch.E12 TV service and other DAB projects for the future would also have been lost. The move was thwarted at recent Geneva talks when Spain tried to change the wording 'countries' to 'administrations' in earlier WRC decisions.(Currently radio amateurs also have problems in signal routing via the Spanish mainland, the writer has seen some quite obscene packet material sent to a Gib. operator from a Spanish 'amateur' - we'd appreciate hearing from any Gibraltar reader on current problems).

Better news elsewhere in Spain with the 'Antena 3 TV' station now into profit, along with 'Canal Plus Espane' where as the other networks are still deep in the red.

To combat the ever increasing popularity of Canal Plus in France, both national broadcaster TF1 and France TV are forming a working partnership to present a channel package on Eutelsat to rival the digital aspirations of Canal Plus.

Italian TV broadcaster RAI is launching several PAY-TV channels partially funded from overseas within the next 3 years and investing over £1 billion in the project.

Radio Wales/Radio Cymru will be the first regions into Digital Audio Broadcasting (DAB) in late 1997.

Finland's YLE is introducing a limited DAB service during 1996 once the terrestrial transmission standard has been finalised (expected December 1995).

Mr. P.A. Sangma, India's minister for information and broadcasting recently announced in New Delhi that he wants high quality f.m. radio transmitters established in all state capitals across the country. There are over 110 million radios (87% population coverage) now in use across India compared with 50 million TV homes (85% population coverage).

Band 1 Frequency Allocations

The Radio Authority have published a document detailing proposed usage for the Band 1, 47-68MHz spectrum. The nearby chart shows probable allocations for this section of the r.f. spectrum. Certain of the allocations are already in use eg. pagers, radio amateurs, low power devices etc.

Band 1 is a TV broadcast band, extensively used throughout Europe though UK Band 1 TV transmissions ceased with the end of 405-line transmissions in the mid 1980s.

The present and proposed allocations for Band 1 will have considerable impact for receiving enthusiasts. Scanner users will have a vast new spectrum to search. TVDXers though will fare less well and could well lose several popular European channels to local interference if not render DX reception almost impossible in populated regions. The 47-55.75MHz band has already been allocated and in use by the new services.

Interference to TVDXing in Band 1 in recent years has been plagued with the growth of low power devices within the 49MHz band, baby alarms, walkie talkies etc., certain of the former having been identified with ranges of at least 1km! Boots/Mothercare usually have several models on show which when used on a housing estate can blanket off both chs. E2/R1, two prime DX channels.

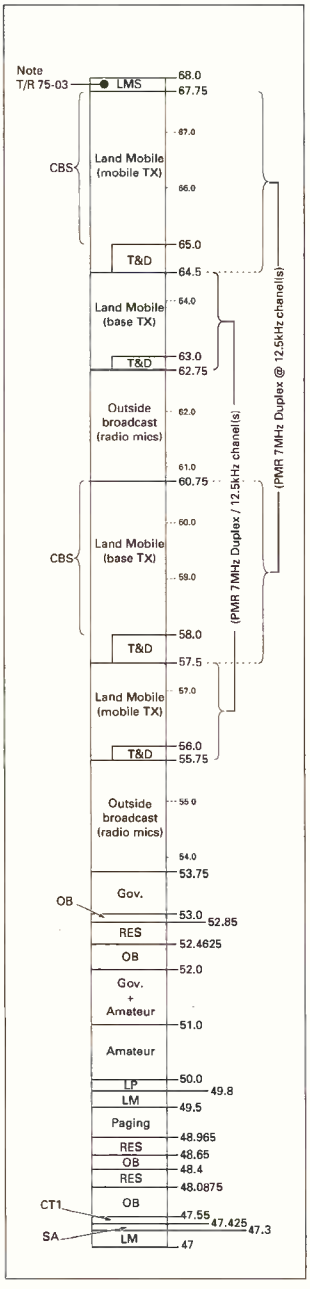
On the allocation plan there are shown two duplex p.m.r. bands with a 7MHz spacing. I have spoken with Diplomat Communications Ltd who have already designed equipment for these proposed bands. Currently the CBS Working Group document specs have to be agreed for these p.m.r. bands. Once the ink is dry on the documentation at least one duplex band will come into operation. Diplomat advise that this will be -

Mobile TX 55.7625 - 56.425MHz and Base TX 62.7625 - 63.425MHz.

There will be 54 channels spaced at 12kHz running up to 25W maximum output into the antenna. There has been no specific commencement date given for the new band (s) though learned comment suggests within the next 12 months - subject to approval of the specifications. I spoke with Diplomat early December '95.

Unfortunately the above bands relate with chs. E3 and E4 which may well present a 'challenge' to TVDXing, given that low band communications will prove popular both by potential range and signal ingress into areas where other higher frequency signals have problem coverage. Notch filtering, slant antennas, phasing tricks etc. may be required to maintain effective TVDXing operation.

Other Band 1 users such as outside broadcasts, radio mics. etc. will be more of an itinerant use rather than a fixed base installation and shouldn't be too much of a problem - here one day and gone the next - we hope!



Election Results

As a result of the ISWL biannual Council elections the new officers are as follows with effect from January 1.

President:
Mrs Evelyn May (G0OZI/G-17197)

Honorary Secretary:
Mrs Maggie Carrington (G0WDM/G-20542)

Honorary Treasurer:
Mr David Beale (G0DBX/G-10618)

Editor-in-Chief:
Mr Ray Miller (G8JGH/G-12537)

QSL Bureau Manager:
Mr Tony Gale (G7NUR/G-13287)

Publicity Officer:
Mr Chris Carrington (G0IYZ/G-20365)

Council Members:
Mr Herbert Yeldham (G6XOU/G-20006)
Mr Peter Rayer (G-13038)
Mr Bill Mackie (GM4AIE/GM-9137)

A significant change is the election of Maggie Carrington to the position of Honorary Secretary. This has the effect of changing the ISWL headquarters address to that of the secretary. Therefore with immediate effect all correspondance with the 'League should be sent to:

The Hon. Secretary,
International Short Wave League
Headquarters,
3 Bromyard Drive,
Chellaston, Derby DE73 1PF.

Czech Republic - attention TVDXers

Nova-TV. progs open 0400UTC, test card ident 'KANO-N', colour bars with 'NOVA-TV' and PRAHA'

CT-1..progs open 0400UTC, CT-2..progs open 0600, both use similar test card to Nova but with 'KANO-1' or 'KANO-2'

Premiera-TV..progs open 0600UTC, colour bars + ident 'PREMIERA'

Norway's TV2 commercial channel may have rivalry from a 2nd commercial terrestrial channel soon which will break up the commercial monopoly enjoyed by TV2. Any new channel will be allowed regional opt-outs from main network programming. Norway's national broadcaster NRK may soon have a 2nd network - NRK-2 - which goes on-air during late 1996.

A fourth national radio 'station' will open for Danmarks Radio early 1997, being financed within existing budgets.

There's an FM/TV DX newsletter being published by **John Faulkner,8 Elton Close, Oak Tree Lane, Mansfield NG18 3QA.** It's called *Skywaves* and a year's subscription costs £5.50 1st class; £4.90 2nd class - send 3 x 1st class stamps for a sample. It's recommended by the BDXC.

Finally from Stathis Panagiotidis, Thessaloniki, Greece we have up to date information on the Band 1 scene....

Stathis receives only a single Band 1 ch.E4 MTB station, that from the former Yugoslav republic of Macedonia. He confirms two other Band 1 transmitters are operating in Greece - ch. E3 Sky TV in Athens - this a private channel (not the UK satellite channel!) and the ET-1 transmitter on ch.E3 operates from the Patria region, atop the Akarnanika Mountain. The channel listing for Thessaloniki is a DXers nightmare, apart from chs.E2, E3, E8, E36 and E61 - which are empty - there are programmes on **all** channels, right up to ch.E69! These comprise local private, national services or satellite programme relays.

MORE NEWS ON PAGE 12

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- 1000 memory channels
- 20 search bands

SPECIAL PRICE
Just **£349** + £10 Carr

VT225
Civil and Military

- Full VHF & UHF airband ranges
- Keypad entry
- 100 memories
- Monitor switch
- NBFM for marine use

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PRO44
Wideband scanner

- 40 memories
- Keypad
- Easy to operate
- AM/NBFM
- Airband, marine
- main pmr & phones

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AR2700
Continuous coverage

- 500kHz-1600MHz
- AM/WFM/NFM
- Optional computer control
- 1000 memories
- Auto mode tuning

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MVT7000
Wide range scanner

- AM/FM/WFM
- 200 memories
- Rotary tuner
- 10 search banks
- Priority channel

Just **£289** + £10 Carr

MVT7100
Multimode scanner

- AM/WFM/NBFM
- USB/LSB
- Rotary dial tuning
- Signal strength ind

SPECIAL OFFER
Just **£299** + £10 Carr

SCANNER ANTENNAS

Watson Regular Gainer	**£12.95**
Watson Super Gainer	**£19.95**
LoweScan resonant airband mobile antenna with mag mount base	**£29.95**
LSA700 Discone 70-700MHz	**£39.95**
LSA1300 Discone 25-1300MHz	**£59.95**
LSA1500 Vertical, 25-1500MHz	**£37.95**

SCANNER BOOKS

UK Scanning Directory	**£17.50**
Scanning Secrets	**£16.95**
Airband Radio Guide by G Duke	**£5.99**
Scanners 3	**£10.95**
Airwaves 95	**£7.95**
Understanding ACARS	**£9.95**
World Aeronautical Communications Directory	**£19.95**

OPTO SCOUT
Automatic tuner and memory caputre device

- Records 400 frequencies
- 255 hits on each frequency
- 10MHz to 1.4GHz coverage
- Optional computer interface

£399 + £10 carr

COMMUNIQUÉ

New TV Broadcasting Bill

A new bill, published mid December 1995, sets out a regulatory framework which gives industry its best chance to make a success of the new digital terrestrial TV services. The adoption of digital technology is central to the Government's long term radio frequency spectrum strategy. It is claimed that "Digital TV will offer viewers wider programme choice and improved picture quality."

The Government has started the process by putting in place a new regulatory framework.

The contribution required of the broadcasting industry is to simulcast both analogue and digital systems, their programmes and to invest in new digital services that are highly attractive to viewers.

Planned is a Government review after five years from the commencement of the new digital services - sooner if penetration of digital sets reaches 50% of households - to establish a timetable for the withdrawal of the channels used by analogue TV services.

At the start of this timetable, there is a requirement that manufactures label all new TV sets manufactured that are not capable of directly receiving digital terrestrial services.

Powers are provided in the Bill to require the 'multiplex providers' - providers of the digital infrastructure - at their licence renewal, to invest in additional measures designed to bring forward the withdrawal of current analogue allocations.

The withdrawal is likely to be a phased affair, with the high penetration areas of the digital system, taking into account the relevant contribution of digital cable and satellite services for the reception of public service broadcasts.

The Science and Technology Minister said, "The Government wishes to encourage the eventual transition of all broadcasting and telecommunication services to digital means of transmission. When all signals are digital then the full power of computer technology can be applied at all stages of the path from the TV studio to TV display, realising the full value to society of the information superhighways and interactive services. The future of broadcasting in the UK is enormously exciting."

There will of course be a very large chunk of spectrum available when the analogue TV infrastructure starts to be dismantled.

Currently, the UK analogue terrestrial TV infrastructure ie. the four national TV channels, uses some 40 frequency allocations between 470 and 582MHz. Each of these allocations requires a bandwidth of 8MHz, this bandwidth is capable of supporting a data rate of 18Mb/s. A typical digital TV signal requires a data capacity between 1.5 and 6Mb/s dependant on the resolution and the extent of rapid movement within the picture.

If just half of the existing allocation were used for the provision of a digital TV service then this would be able to support and additional 60 to 240 TV channels.

It is most probable that digital terrestrial TV broadcasting will begin with digital 'set-top' decoders for use with existing TV sets. Soon afterwards it is expected that the top-of-the-range receivers will have digital receivers built-in. In due course prices for the relevant semiconductors used in the receivers will fall and digital TV will become the norm.

Realistic PRO-27

The latest hand-held scanner from Realistic is the PRO-27. Like most of the Realistic range of scanners the PRO-27 has a discontinuous frequency coverage. The seven ranges cover the following parts of the r.f. spectrum 66-88, 137-174 and 406-512MHz, so tough if you wanted to use it for civil air monitoring. The new model has 20 memory locations, plus a search facility which can be activated on any of the ranges.

Power supply is either via internal alkaline cells or by external 12V d.c. - useful for in-car use. Sensitivity is claimed to be 0.5μV. Scanning rate is a pedestrian ten channels per second.

Aimed at the entry and second receiver market, this new Realistic scanner can be obtained via the usual outlets. For more details contact: **Mike Bowthorpe, Link Electronics, 216 Lincoln Road, Peterborough PE1 2NE. Tel: (01733) 345731, Fax: (01733) 346770.**

Optima for ACARS

Martin Lynch - The Amateur Radio Exchange Centre, introduces what is believed to be the first ACARS only receiver, the MyDEL Optima.

The dedicated receiver is a high performance single channel design enabling enthusiasts to release their existing scanner from monitoring the 131.725MHz channel utilised by 'European ACARS'.

The unit is simple to operate, requiring an external 12V d.c. power supply and a suitable antenna (discone or dedicated air-band). The receiver allows direct connection to the Universal M-400 ACARS decoder for instant dedicated receiving system. Those ACARS enthusiasts with a PC can utilise the Lowe Airmaster software as an alternative.

The MyDEL Optima ACARS receiver retails at £139.95 it and the ACARS decoding facilities mentioned are available from **Martin Lynch, The Amateur Radio Exchange Centre, 140-142 Northfield Avenue, Ealing, London W13 9SB. Tel: 0181-566 1120, Fax: 0181-566 1207.**

Benfleet RAE Course

The South East Essex Sixth Form and Community College will be running courses and exams for the RAE from this January onwards. Courses run from January to April and September to December each year.

The session commencing January covers the syllabus for Paper 1 and that commencing September - Paper 2. Examinations for both papers will be held each May and December as usual.

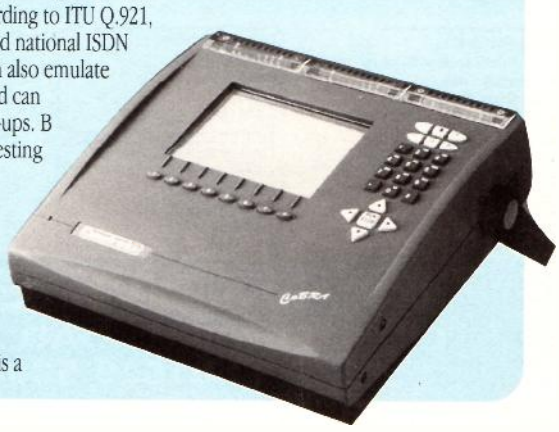
Meetings will be held on Saturday mornings from 1000-1230. Candidates will be allowed to use the College station GX7PRU as part of the course. The Facilities of the Electronics Department will also be available making the approach a very practical one. For further details contact: **Adult Education Secretary, Carole Cork, SEEVIC College, Runnymede Chase, Benfleet, Essex SS7 1TW. Tel: (01268) 756111, Fax: (01268) 565515.**

ISDN Test Set

Consultronics, the innovative manufacturer of telecommunications test equipment announces the release of their brand new ISDN test set the CoBRA. It was launched at the recent Telecom '95 Geneva, Switzerland.

The unit can monitor and decode layers 1, 2 and 3 of the ISDN D channel according to ITU Q.921, Q.931, Q.932 and national ISDN standards. It can also emulate NT, TE or LT and can perform call set-ups. B channel BERT testing and analogue measurements and interfaces for BRI S/T, BRI U, and PRI S/T are also available.

Consultronics is a registered ISO9001 company. For further details contact: **Robert Fitts, Consultronics, 160 Drumlin Circle, Concord, Ontario, Canada L4K 3E5. Tel: +1 905 738 3741, Fax: +1 905 738 3712 or E-mail: rfitts@consultronics.on.ca**



COMMUNIQUÉ

EDXC Election

The Secretary General of the European DX Council has announced that he will not be seeking re-election for 1996.

In a statement Secretary General, Michael Murray stated that after a term of some 16 years it was time for some new blood in the post, hopefully this would bring some fresh ideas to the position.

Nominations have been invited from the clubs, elections will take place shortly. The results of which will be featured on these pages when announced.

The Council continues to hold an Annual Conference. The location of Florence, Italy, will be the venue for the 1996 event. The dates of the conference are 26-29 April. Details are available from the organisers: **A.I.R., PO. Box 30, I-50141 Firenze Succ 30, Italy**.

Code-3 Gold Decoder

Hoka Electronics announce the provisional details of what looks like a very exciting new product from their excellent stable of decoding products.

They state that, "Code-3 Gold - has got to be the hottest decoder to hit the streets. Over a year of hard development work over at our Netherlands HQ has resulted in this latest Decoder product. Using the very best of software d.s.p. filtering technology from Code-30

The use of surface mount technology for the hardware has resulted in the imminent release of this new and exciting product from Hoka Electronics."

The main features are:

Low price - provisional price is less than £350.

The Code-3 Gold requires no power supply as its power is derived from the host PC.

Both 9-way and 25-way serial connectors are supported. The use of miniature construction allows the whole interface to fit into a standard, fully screened 9-way to 25-way serial cable connector adapter box and it is claimed that it produces no r.f.i. or e.m.i.

The Code-3 Gold software will run on all PCs with a 386DX40 or better processor, but the use of a 486 is highly recommended. This latest offering from the Dutch decoder specialists now only supports a minimum of VGA, alfhough SVGA with Tseng ET4000 chip set is possible.

Like all modern programs, performance is enhanced by the addition of more memory and processor power.

Like its predecessors Code-3 Gold **does** run in a Window 3.1 DosBox - but only if your PC is a 486/100 or Pentium. It will definitely **not** work under Win95 yet!

Code-3 Gold features no copy protection and it can be installed on as many computers as you like. The interface acts as the 'dongle'.

There are no ACF Analysis tools except shift and speed measurement, AutoClassification, oscilloscope and ASCII Save to Disc. No 'Bit Buffer' storage/replay capability are provided. For experts who want to start analysing signals in very close detail - the Code-30 is recommended.

Basic Code-3 Gold is for use with v.h.f. systems and the more common h.f. systems only - ACARS/SITA, POCSAG, d.t.m.f., Packet (300+1200), Baudot, ASCII, Sitor ARQ/FEC, Pactor, Fax (f.m. and a.m. Meteosat) and SSTV (Martin 1 only).

For those in need of more capabilities, the only addition available will be a short wave option. This will include the lesser used modes - Annex10 (A/c selcal), Hell, Morse, ARQ-S, ARQ-SWE, ARQ-E, ARQ-N, ARQ-6, ARQ-E3, POL-ARQ, Twinplex, Artrac, F7BBN Baudot Twinplex, CCIR242, CCIR342, FEC-A, FEC-S, Autospec, Spread, HC-ARQ, TORG10/11, ROU-FEC, HNG-FEC, Coquolet 8/13, Piccolo Mk6, SYNOP (AAXX/BBXX with 10000 stations). Pricing level for this Code-3 Gold option is expected to be around £125.

For more details contact **NTech Communications, 8 The Crescent, Willingdon, Sussex BN20 9RN. Tel/Fax: (01323) 483966**.

National Transmitter News

Television Relay Stations

October 30 Cleckheaton, West Yorkshire a new relay station began operation following a period of test transmission. The relay is located some 10km north east of Huddersfield. The station is located on a mast approximately 1km south west of the town centre. Provided jointly by NTL and the BBC the relay is designed to give good television, NICAM and teletext reception to extra 300 people in the south west of Cleckheaton, including Quaker Lane, Ashbourne Avenue, Ashbourne Drive, Ashbourne Way and Clare Road. It may also provide a useful alternative signal to other nearby residents.

Station Details

Channels:	BBC 1 (North)	55
	BBC 2	62
	ITV (Yorkshire TV)	59
	Channel 4	65
Antenna Group:	C/D	
Polarisation:	Vertical	
ERP:	2W	

November 5 Blaydon, Tyne and Wear a new television relay station has opened about 8km west of Newcastle upon Tyne, following a period of test transmissions. Provided jointly by the BBC and NTL the relay is located on a mast about 500m north of Blaydon Burn. This new transmitter is designed to provide good television, NICAM and teletext reception to an additional 580 people on the west side of Blaydon, to include residents in Burn Road, Meadow Close, Bessie Terrace, Mary Street, Helen Street and Frances Street.

Station Details

Channels:	BBC 1 (North East)	51
	BBC 2	44
	ITV (Tyne Tees)	41
	Channel 4	47
Antenna Group:	B	
Polarisation:	Vertical	
ERP:	4W	

November 27 Llangranog, Dyfed a new relay station began operation. The station has been built jointly by the BBC and NTL it brings the possibility of improved television reception to about 230 people in and near Llangranog. To take advantage of the new station viewers will need good quality antennas directed toward the relay, which is located at Penralt Farm, east of the centre of Llangranog.

Existing antennas aligned on other stations may be of the wrong group and, if so, should not be used for the new relay. Antennas should be mounted outside with a clear line of site to the relay. Poor quality and set-top antennas are not recommended.

Station Details

Channels	BBC Wales on 1	22
	BBC Wales on 2	28
	HTV Wales	25
	S4C	32
Antenna Group:	A	
Polarisation:	Vertical	
ERP:	8W	

New BBC FM Transmitters

November 24 Cirencester, Gloucestershire. A new station now brings good f.m. radio reception including stereo to an extra 9500 people including most of Cirencester, is now in full operation.

The transmitting antenna is located atop the parish church of St. John the Baptist

Frequencies are: Radio 1 97.7MHz, Radio 2 88.1MHz, Radio 3 90.3MHz and Radio 4 92.5MHz. This station is vertically polarised.

BBC Radio Gloucestershire broadcasts on 95.8MHz from the Cirencester television transmitter site, located about 4km north of Cirencester.

November 27 Bridport, Dorset. A new station now brings good f.m. radio reception including stereo to an extra 6700 people in Bridport, West Bay, Bothenhampton, Bradpole, Symondsbury, Salwayash and surrounding areas as far north as the villages of Waytown and Melplash after a period of test transmissions.

The transmitting antennas share the same mast as the Bridport television transmitter, which is located about 2km south west of Bridport, near the village of Highlands.

Frequencies are: Radio 1 98.7MHz, Radio 2 89.1MHz, Radio 3 91.3MHz and Radio 4 93.5MHz. This station is vertically polarised.

Further information on f.m. reception - including advice on fitting an external antenna - is available from:

BBC Engineering Information
Villiers House
The Broadway
Ealing
London W5 2PA
Tel: (0345) 010313 (local rate call)

HAYDON COMMUNICATIONS

OPTOELECTRONICS

NEW OPTO SCOUT 3.1-Mk2

NO INTEREST, YOUR JOKING! Latest Mini Frequecy Finder From Optoelectronics. It will capture and memorise up to 400 frequencies that can be recalled directly into the AR8000. Supplied with ANT, Nicads and Charger. RRP **£399**

Scout INTEREST FREE! £49 deposit 10 months @ £35 = **£399**

NEW OPTO CUB

The Cub is ideal for communication, surveillance and recreational monitoring applications. From 10MHz-2.8GHz. The Cub has maximised sensitivity for detecting RF in the near field and displaying the frequency detected. The cub features a digital filter that reduces false counts and random noise, digital auto capture that acts like an intelligent hold button allowing any frequency captured to remain displayed as long as needed.

RRP **£139**

NEW DB-32

A Minature Wideband Antenna. Receives 30 - 1200 MHz. Transmits 2m/70cm, BNC fitting only 1.5" long its superb

RRP **£29.95** P & P £1

SCANNING RECEIVERS

PRO-2036

Wideband Desktop Scanner with rotary tuning and tone encoder ~~£349~~

Limited Stock **£249.95**

AOR AR-5000

New wideband all mode base receiver. 10kHz-2600MHz. The Ultimate machine. Why not part-ex your old receiver and move into the 21st century.

OUR PRICE **£PHONE**

ICOM R-7100DC

25mHz-3GHz. AM, FM, WFM, SSB. £1449

ONE PIECE ONLY

£1199.95

SPECIAL OFFER

AOR AR-3000a 100kHz-2036MHz, SSB, CW, AM, FM, WFM, 400 memories

RRP £999 OUR PRICE **£869.95**

BUY THE **AR-8000 + OPTO SCOUT** TOGETHER INCLUDING MODIFICATION & CONNECTING CABLE.

RRP £848.

SPECIAL OFFER £719

HANDHELD SCANNERS

NETSET PRO-44

WANT TO GET INTO SCANNING? THEN THIS IS IDEAL FOR YOU

Listen to Aircraft, Ham, Marine and much more with this superb scanner. Covers 66-88/108-174/380-512MHz. ~~£149.95~~.

OUR PRICE **£119.95**

REALISTIC PRO 25 ..... ~~£179~~ **£159.95**
REALISTIC PRO 26 ..... ~~£299~~ **£269.95**
PRO 44/43 CASE ..... **£15.99** £1 P&P

AOR PRICES SLASHED

AR-8000

The ultimate handheld receiver. RRP £449

OUR PRICE **£369.95**

AR-2700 RRP £299 ..... OUR PRICE **£239.95**
Soft case for 8000/2700 ..... **£17.95**
CU-823 comp I/face **£99.95**
SW-8000 S/ware for 8000 ..... **£49.95**
ABF-125 airband filter **£28.50**

STAR BUY

REALISTIC PRO-43

Listen to aircraft/ham, marine, mobile phones and much more with this superb handheld scanner . Covers 66-88/118-174/220-512/806-1000MHz. **RRP £249.**

£169.95

YUPITERU MVT-7100

Handheld scanner cover 100kHz-1650MHz. All mode. RRP £420

OUR PRICE **£289.95**

MVT-7200 RRP £449 ..OUR PRICE **£369.95**
MVT-7000 RRP £349 ..OUR PRICE **£269.95**

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Deluxe over the ear earpiece.

£9.95 + £1 P&P

P&P £2

MA-339

Mobile holder for H/helds

£9.99 P&P £2

QS-200 .....Air vent holder **£9.99**
QS-300 .....Desk Stand **£19.95**

TSA-6201

Superb quality ext speaker with volume control **£14.99** P&P £1

CLIP ON MINI SPEAKER

Ideal for portable scanners. Swivel clip attaches to collar or lapel for easy listening while you carry your portable on a belt clip. (3.5mm plug)

£9.99 P&P £1

SCANMASTER SP-55

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

RRP **£69.95** P&P £3.50

ANTENNAS

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Professional quality airband base antenna, Civil & Military, Just over 1m long, including Mounting brackets.

£44.95 £4 P&P

DB-770H

Telescopic antenna with wideband receive 25 – 1300MHz RRP **£24.95** P & P £1

TSC-2602

Flexible Wideband Antenna 25 – 1300MHz 14" Long

£22.95 P&P £1

BSS-1300

Loft or outside antenna receives 25-1300 MHz COMP. with coax and plugs

£69.95 P&P £7

DSS-1300

Wideband desktop antenna covers 25-1300MHz.

£44.95 P&P £3

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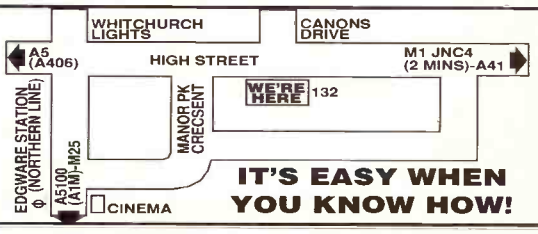

HOW DO WE DO IT? Constantly criticised by our competitors for our low pricing – yet we are growing from strengh to strengh. with our constant striveing to keep our prices low, we keep our overheads to the minimum. we negotiate the best deals from manufacturers with our massive buying power and you get the keenest uk price with quality assured service. we're even expanding to a 2nd shop
– see this space next month

COMMUNICATION RECEIVERS

YAESU FRG-100
RRP ~~£699~~
OUR PRICE **£449.00**

KENWOOD R-5000


RRP ~~£1059~~
OUR PRICE **£899.95**

AOR AR-7030


RRP £799 OUR PRICE **£PHONE**

DIGITAL AUDIO FILTERS

TIMEWAVE DSP-59+
As recently reviewed, this is far the best "DSP Audio Filter" available. We've sold hundreds and have had nothing but good reports. Isn't it about time you cleaned up your shack?
RRP £299 OUR PRICE **£275**

DSP-9+ RRP £239.95 ..... OUR PRICE **£225.95**
Datong FL-3 ..... OUR PRICE **£149.95**

COMPACT SW ANTENNAS

VECTRONICS AT-100


This is a superb self contained antenna system for inside the house/flat. for better results you can even connect a longwire antenna to the rear. Don't miss out any longer! Add one of these to your receiver (built in preselector)
RRP **£79.95** P&P £4
Sony AN-1 active antenna ..... **£59.95** P&P £6

PORTABLE SW RECEIVERS

Sony SW-77
This is the best portable SW receiver on the market. Every week we get phone calls from customers wishing to part-ex their old Grundig/Sony or Panasonic receiver. Isn't it about time you considered moving up to the best there is!
RRP ~~£399~~
OUR PRICE **£349.95**

SONY SW-100E
Award winning minature SW receiver.
RRP £219.95
OUR PRICE £189.95
SW-55 ..... RRP £299 ..... **OUR PRICE £259.95**
ICF-7600G .... RRP £199 ..... **OUR PRICE £169.95**

SANGEAN ATS-803A
UK's Best Selling SW Receiver. All Modes INC SSB **OUR PRICE**

£129.95 P&P £6.50

SRX-50
World wide digital radio with clock and 20 presests.
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WE NEED YOUR USED EQUIPMENT TOP MONEY PAID

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Ready built, ready to go antenna tunning unit.
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Passive (non-powered) desk or wall mount shortwave antenna. (0-30MHz) with a built in magnetic balun. OUR PRICE **£44.95** P&P £4

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Built in balun. SO239 connection.

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DX end fed long wire kit, up to 150ft of copper wire. The Complete Package. **£24.95** P&P £3

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SECONDHAND & EX DEMO BOARD

KENWOOD R-5000
+ VHF converter.
Ex-demo as new **£949.95**

FRG-100	Mint condition	£399.95
R-5000	VGC	£799.95
IC-R71E	VGC	£699.95
PR-150 pre selector		£219.95
HF-225	As new	£399.95
HF-150	As new	£349.95
R-600	VGC	£299.95
R-2000 + VHF converter		£429.95
FRG-7700	VGC	£299.95
FRG-7	VGC	£189.95
R-8E	As new	£899.95
PK-232MBX	Ex demo	£269.95
Sony SW-1E	As new	£109.95

AR-3000A
Immaculate condition
£799.95

AR-3000	VGC	£649.95
PRO-2032	As new	£189.95
PRO-2022	VGC	£129.95
Signal R532 airband receiver		£149.95
PRO-2025 66-512MHz with gaps		£89.95
Shinwa scanner wideband mobile		£249.95
AOR-950	VGC	£179.95
Sony SW-55	Ex demo	£229.95
Sony SW-77	As new	£299.95
RFB-65	As new	£149.95
R-808	As new	£89.95
YB-500	Mint condition	£149.95
YB-400	As new	£109.95
ICF-7600DS	VGC	£99.95

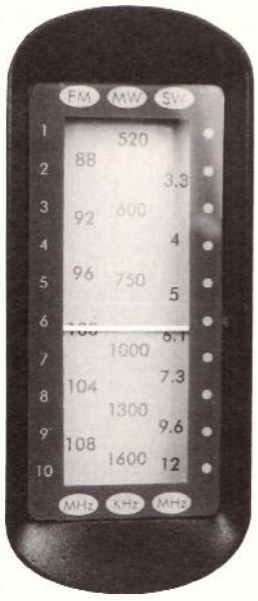
MVT-7100
Immaculate condition
£269.95

MVT-7000	As new	£229.95
PRO-43	Immaculate	£139.95
VT-225	As new	£199.95
WIN-108 Airband Rx		£99.95
AR-2000E	As new	£209.95
AR-1500EX	VGC	£269.95
IC-R1	VGC	£299.95
PRO-46	VGC	£149.95
PRO-35	VGC	£119.95
HP-200E	VGC	£199.95
BC-200XLT	VGC	£179.95
AR-8000	As new	£349.95
AR-1500	VGC	£249.95

BayGen Freeplay W

A portable radio that doesn't require batteries or mains power offers the Third World countries the means to get radio to the poorest people. British inventor Trevor Baylis thought of using clockwork power to solve the problem - the end result being the BayGen 'Freeplay 'wind-up radio made near Capetown, South Africa. The story of how Trevor Baylis came to invent the clockwork radio and how it developed from an idea to a production item was told in a television documentary programme last August. I must admit to being fascinated by the programme while at the same time being left very disappointed. It concentrated on the human aspects while glossing over the technical points.

In trying to review this intriguing piece of equipment I have kept in mind what it was originally conceived for. It is not intended to be a set for the serious DXer. Indeed it has been designed with impoverished Third World citizens in mind. In terms of sound quality it is certainly not hi-fi. However, it is acceptable as long as the volume is kept at a reasonable level. Turn it up too high and the distortion becomes unbearable.



The simple dial. Backlash in the tuning system made tuning weak signals tricky.

Three Wavebands

The 'Freeplay' comes as standard with three wavebands, selected by a slider switch on the same end as the tuning knob, volume control and on-off switch. The v.h.f. f.m. band covers the standard broadcast band of 88 to 108MHz in mono only. Medium wave coverage runs from 520 to 1600kHz while short wave is catered for from 3 to 12MHz - covering the Tropical Bands.

The controls are positioned at the oposite end to the winding handle.

Two built-in antennas are provided. The v.h.f. f.m. and short wave sections share a telescopic whip antenna while medium wave uses an internal ferrite rod antenna.

Spring

The radio is powered solely by the BayGen clockwork generator. The instructions warn against opening the case and we received an urgent telephone call from Martin Lynch warning us against trying to look inside. A pity as I would love to see just what sort of spring was being used. The TV documentary glossed over such technicalities.

To operate the radio it needs winding up. This is accomplished by the winding handle on the right hand end of the set. The winding operation needs the set to be placed on a firm flat surface, the handle held with the left hand and the spring wound with the right hand. It does require a fairly strong arm to complete the 60 turns needed for a full wind, particularly if it is to be accomplished in the stated 20 seconds!

The on/off switch performed in a most interesting way. In the 'on' position the winding handle rotated at about two revolution per second and audio came out of the speaker. Slide the switch to the 'off' position and the audio was muted as expected. However, the winding handle didn't stop, continuing to rotate, but at the much reduced rate of one revolution every three minutes. I can only assume that the switch puts a short across the generator to acheive this. This slow 'discharging' of the spring reduces the number of turns needed for a full wind after the set has not been used - unless some three hours has passed.

Winding the spring during playing obviously stops the set working. The publicity material states that for a full wind, which should take 20 seconds, a playing time of 40 minutes is available. The set supplied for review would only achieve 30 minutes. At the end of this period the set was mechanically turned off with a distinct 'clunk'.

The spring generator was not completely silent, some gear noise being audible with the audio turned down. However, in use this was not noticeable and didn't detract from the usefulness of the set. At random intervals during playing the spring seemed to make some 'grunting' noises, but again this was not too distracting.

The radio is substantially built and looked as if it would be capable of taking some fairly severe punishment - short of stopping a charging rhino.

The winding handle - reminiscent of a Megger.

Wind-up Radio

How about never having to buy batteries for your radio? Dick Ganderton has been trying out the clockwork radio from South Africa.

Tuning

Tuning was accomplished by a simple knob set into the left hand end of the set. A thumbwheel was also available in a recess on the front of the set if prefered. The dial pointer was driven by a cord and pulley system and seemed to suffer from a lot of backlash, making fine tuning difficult. The dial itself is a simple one with the three wavebands in vertical columns. Only very minimal frequency information was on the dial - rather like a clock with only 3, 6, 9 and 12o'clock marked. A simple, three-position, slide switch positioned alongside the volume control selects the band.

I found tuning local transmitters to be no problem but on the short wave band it was more difficult. However, as I have said before, this set is not for serious DX listeners and the performance should be more than adequate for its intended use in the Third World as an educational aid.

Charity

The 'Freeplay' clockwork radio is certainly an interesting project and will be the talking point of owners for some time to come. In developed countries, like the UK, it is only likely to appeal to those who can already afford batteries. However, BayGen Europe aim to drive sales of a limited number of the clockwork radio to generate funds to enable them to donate 'Freeplay' radios to the War Child charity organisation for their first proposed African project in Angola.

In fact, 'Freeplay' is charity driven. The factory near Cape Town where 'Freeplay' is made is owned by Disability Employment Concern (Pty) Ltd. and at least 60% of the staff are disabled or disadvantaged. The new plant has the capability of producing 20000 'Freeplays' each month with an eventual production capability of one million radios each year. The clockwork 'Freeplay' radio is priced at £79.95 in the UK and is available from **Martin Lynch & Son, 140 - 142 Northfield Avenue, Ealing, London W13 9SB. Tel: 0181-566 1120** who kindly provided the set for review. ■

BayGen UK have informed us that the radio we reviewed was a pre-production model. Production models have had some changes to the 'engine' which should result in it being quieter and running for the full 40min on one wind.

SPECIFICATION

Frequency range:	FM	88 - 108MHz
	MW	520 - 1600kHz
	SW	3 - 12MHz
Audio output:	4W into 8Ω	
Speaker:	89mm dia.	
Power source:	B-Motor carbon steel spring driving a generator	

	Specified	Tested
Length of run:	40min	31min
Wind-up:	60 turns	60 turns
Rate of turn:	On	30s
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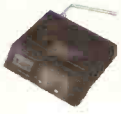

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Wire Antennas

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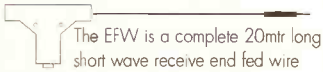

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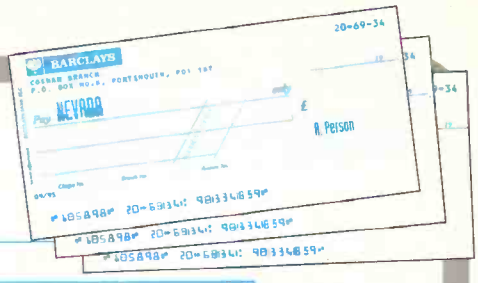

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A Day In The Life Of A Radio Inspector

Probing The Galena

Young Golly and Kilocycle Ken try to track down the music and voices coming from a bed!

Kilocycle Ken lay on the candlewick bed cover of the matrimonial double bed, his ear to the mattress. The woman of the house hovered anxiously on the rag mat in her wrap-around apron. The Holland blinds were pulled down because she didn't want the neighbours to see in.

"Anything?" Young Golly the radio inspector trainee asked.

"No," Kilocycle Ken said.

"Can I listen?" the woman complainant asked.

Kilocycle Ken clambered off.

She pressed her curlered hair against the sagging lumpy kapok mattress, closed her eyes.

Young Golly sighed.

Kilocycle Ken sniffed roast mutton from the kitchen oven inside this suburban galvanised iron-roofed bay-windowed wooden bungalow in the shadow of the radio broadcasting mast on the top of the hill.

She shook her head disappointedly. "I can't hear anything."

She had complained that she could hear music and voices coming from the bed, and there was no radio in the room. Was she going mad?

"It seems to have disappeared," Kilocycle Ken observed.

Young Golly whispered, "Ask her if movement on the bed makes it come and go."

"You should have been here last night," she said loudly.

"I believe you," Kilocycle Ken said.

"Thousands wouldn't," she said doubtfully.

Kilocycle Ken assured her that she wasn't hearing things, at least not unearthly sounds, there were probably radio signals being rectified by the wire-wove mattress, just as a transistor could rectify, perhaps in this case caused by rust, or two different types of metal touching. "The mattress could be said to be acting like a crystal set of yesteryear."

"How can it be fixed?" she asked.

Almost Impossible

There wasn't a simple solution. Finding the exact place where rectification was occurring in the wire wove was almost impossible.

"Buying a new bed is a way out."

She didn't like that.

"You do have the satisfaction of knowing that you aren't hearing things, or you are hearing things, to put it another way, but it's not supernatural."

Young Golly said, "You do have the advantage of being able to listen to a radio station without paying for the electricity to run a radio."

Kilocycle Ken said, "Unwanted rectification of radio signals by devices akin to crystals has always been relatively common, especially close to transmitters. Signals have been heard coming from gas stoves, from false teeth, spectacles, anywhere where two dissimilar metals touch and where there is a strong electromagnetic field. Sometimes the effect is produced by touching pipes. Telephones once suffered from the same problem, caused by rectification in the then usual carbon microphones."

"A .002 across the microphone fixed it," Young Golly said wisely.

"We'll leave it to you," Kilocycle Ken said.

Outside, Young Golly said, "Another satisfied customer."

Kilocycle Ken said, "I had a crystal set years ago."

"I thought you would."

Desirable

"A crystal set was a very desirable piece of apparatus in a boy's world, crystals were magic, and nothing could beat the thrill of hearing music and voices on such a powerless device. It was a large coil of fabric-covered copper wire on a two inch varnished cardboard tube, a galena crystal in a metal holder and a cat's whisker, a tuning capacitor, two clips for the prods of the headphones, all connected together and mounted on a square of wood.

"I had Cannonball headphones of aluminium, Bakelite caps and there was a brown leather band which became greasy with Brylcreem.

"A large aerial was necessary so I used the wire wove of my mattress, a large mass of coiled wire on which the conventional kapok mattress was spread, like the complainant's.

"I've got a water bed," Young Golly said. "No chance of hearing music on that."

"A crystal set enabled a private world, one was not restricted to the living room and the valve wireless, there was privacy, long before the transistor and the Walkman was invented."

"But not mobility," Young Golly said.

"I could listen to 1ZB and 1ZM and 1YA in Auckland, often all mixed up together, as is the way of crystal sets because they have little capacity of selecting and separating different broadcasting stations. They did work very well in areas with only one medium frequency station."

"They wouldn't work now, we've got more broadcasting stations than New York."

Kilocycle Ken said, "At night I probed the grey glistening knob of the galena, the size of a small pea, and with breath held, searched for the most sensitive spot. The signals were loud at some places where the spring cat's whisker touched, in other places they were faint, and sometimes there was nothing to be heard.

"Many different types of crystal were used for such sets, galena was common, and there was zincite, fused silicon, copper pyrite, graphite, iron sulphide, bornite, carborundum, molybdenite.

"And with deliberation, a radio receiver which will act similar to a crystal set can be put together using two needles and a pencil, a knife blade and a piece of a incandescent lamp filament, a section of dry-cell battery carbon and an iron wire, a razor blade with a pin for the cat's whisker. Such crude reception devices were made by World War II prisoners of war to listen to forbidden radio broadcasts. Used to be that guys in prison could make razor blade radios, don't have to do anymore, they've got multi-channel piped radio.

"And in the early days of wireless at sea, crystal sets were used for reception of telegrams. After the Titanic disaster of 1912, ships were required by law to carry a crystal set for emergency reception.

"Guglielmo Marconi was never an advocate of crystal receivers, he favoured the magnetic detector and the coherer. On the Titanic the magnetic receiver was standard, with the coherer - a glass tube filled with metal fillings - for standby use, but one or other of the two operators would have had a piece of crystal.

Unreliable

"Crystals at sea were considered by some to be unreliable, they needed constant adjusting for sensitive spots, and often went dead in the middle of a message. The vibration of the ship could throw them out of adjustment, or a crash of static could paralyse them, but nearly all marine wireless operators had their own crystals, tenderly wrapped in cotton batting when not in use, sacred pieces by whose alleged virtues and marvellous receptive powers they swore by. And maybe there was more to those old crystal sets than met the eye?"

"What do you mean?" Young Golly asked.

"The crystal ball symbol of the occult is of hidden wisdom and fortune telling, gazed into, it is possible to see into the past, tune into the future. There are legends of the ancient continent of Atlantis where crystals generated power for entire cities."

"Different type of crystal," Young Golly said.

"But nevertheless a mineral, and one version of the story is that the abuse of those crystal energies resulted in the eventual destruction of the Atlantis civilisation."

"A fairy story," Young Golly said.

"I used to know a guy who ground his own crystals for amateur and m.h.f. communications gear. He had a stack of World War II rocks."

"No call for them now."

Meditation

"Big simple crystals, holders as big as a box of matches. You wanted to QSY then, change the crystal. But now quartz crystals have become popular in other ways. It is believed, by some, that crystal forces set the electromagnetic field of the Earth so that human souls can incarnate. Some believe that such crystals are sources of light and energy and can be used in meditation, to develop intuition and learn from the higher senses, balancing and heading. When one tunes into such a crystal it becomes a mirror that will reflect the light within back into the consciousness."

Young Golly said, "I never knew you were one of those New Age people."

"When crystals are used for healing purposes, they become very receptive to the vibration of the individuals and can pick up and retain energies."

"If you believe," Young Golly muttered. "You're as nutty as some of our complainants."

"But then before the invention of wireless the ancients would have dismissed the fact that galena, or those other similar minerals, could receive voices through the air."

Young Golly laughed. "I doubt if any gypsy crystal ball fortune teller could have seen you in that house lying on the complainant's bed. What a sight!"

■

Ambition Unfulfilled

Most young boys wanted to be an engine driver when they grew up. John Worthington was different - he wanted to be a Government Interference Inspector!

In the days of my extreme youth, not many kids used to answer the question 'And what does sonny want to be when he grows up?' with the words, 'A Government Interference Investigator'. But I only mention those to underline my early hopes. In those days, a Government Inspector of any kind, gas, water, Police, medical, etc., carried with him an aura of massive power and it was this factor that a strong attraction to a little squirt like me.

When eventually I obtained my Ham ticket and had been 'done' by the local gauleiter twice, the possibilities of the work became manifest and as I went about my duties in civilian life, there was hardly any day when I didn't spare a thought for those lucky enough to have collared a post in the Department.

I would picture myself leaping out of bed each morning, winter and summer, with the eagerness of a honeymooner, ready for my daily task of sorting out some poor devil's interference, walking away leaving him revelling in a smooth, noise free band. And I would have an underling to accompany me to carry my AVO and sandwiches! And to be paid a handsome salary with a pension in due course when I should retire to a cottage on a hilltop overlooking long path to VK!

However, my reveries on a daily and nightly basis were to be shattered for good when I became a close acquaintance of Lupe Ferrite (A pseudonym-publication of his real name would surely tempt revengists and silent carrier swoopers). Lupe had been with the Department since graduating from a red brick university with a Third in Trombone Studies.

He had obtained a lowly post due to the Personnel blokes fancy for his (Lupe's) stepmother, and was soon carrying an AVO plus all the trimmings. His actual knowledge of radio and electronics, if made of leather, could not have assisted in the manufacture of a watch strap for a gnat, but he could make a nice cup of tea.

Hierarchy

He rose quickly through the hierarchy of the Interference Department and when we met, he was already wearing the two medal ribbons of the Overmodulation Club and the Compressor Society. He showed me his Solar Storm Belt which was kept polished by the up and down motion of his waistcoat.

He was a heavily built chap due mainly to the steady diet of junk food the job entailed. Hours were spent wandering around the streets of the city and the temptation to drop into the many available 'caff's', for a bacon sarny was never resisted.

Alarming Tales

But he told me many alarming tales of his encounters with enraged 'clients' and I can tell you it put me off the work for good. Finally, he invited me round to his shack - I should have mentioned that he manages to pass his RAE by judicious use of guesswork, going on to pass his Morse by the same method.

His equipment was the usual mix of old and new, and you know how it is - you can't take it all in without spending some time. He showed me what he called a 'nose clipper', a cigar like object, apparently battery driven. 'Solid State?' I enquired, and he told me rather cryptically that it was indeed, especially after a heavy cold.

Horrible Noise

Anyway, I'm sure you can't spare the time for me to describe his rather mundane gear, so I'll get to the nub. He flicked through a few switches and the shack was filled with the most horrible noise I have ever heard. It was a jagged, rasping glass cutting sharsh which had every loose object shuddering in its influence. 'Where's that from?' I bawled with cupped hands into his left ear. He made a dive and switched everything off - he was pale and shaking. 'I'm sorry about that - it must have been the XYL in the bathroom shaving her legs'.

Well, that's it..... I just thought you ought to know that even Government Inspectors have their problems. ■

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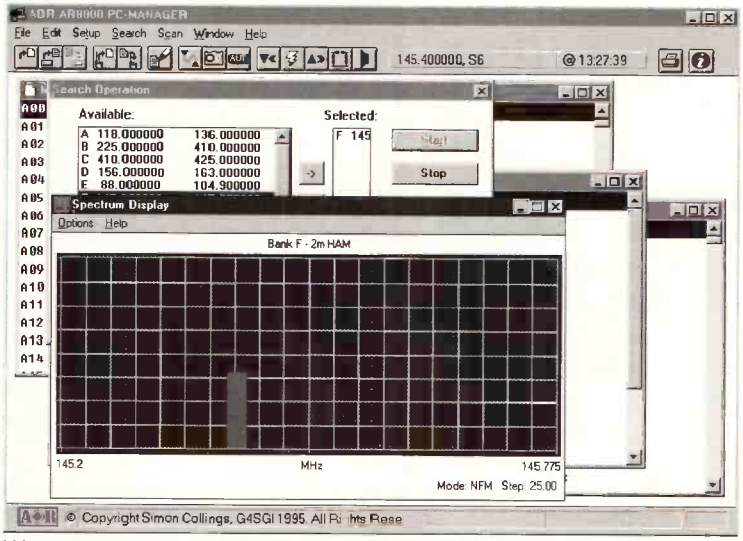

We are happy to announce the arrival of the new WINDOWS management software package for remote control of the AR8000 & AR2700 using an IBM compatible computer running Windows 3.xx or Windows/95. Facilities include memory / search bank upload, download, editing, sorting, automode bandplan data change, spectrum display and sound recording to disk (also requires CU8232 interface or equivalent plus serial lead). **£49 + £3 P&P**

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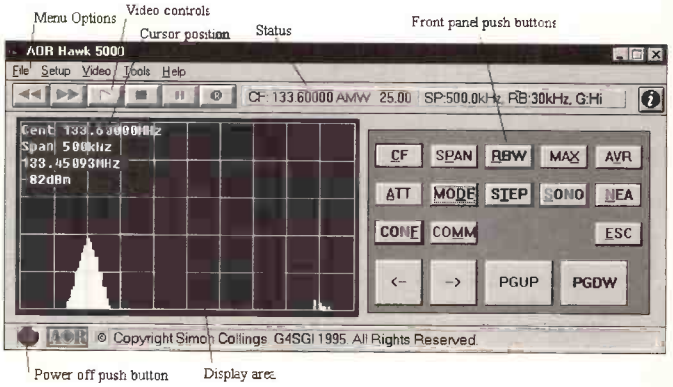
New WINDOWS software package for the SDU5000



HAWK-5000 is a brand new PC control package for the SDU5000 spectrum display unit. HAWK-5000 will work in conjunction with the AR3000A plus ICOM ICR7100 receivers. Video frames may be stored to disk for replay at a later date and SONOGRAM makes identification of signal changes very easy. Spectrum data can processed by HAWK-5000 to produce channel occupancy for export into formats suitable for other AOR packages so providing automatic loading of memory channels. The computer must be a minimum of 486DX66 IBM compatible with fast graphics and running Windows 3.xx or Windows/95 (also requires a serial lead). A necessity for the professional listener.

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Momentum MCL1100

Momentum have achieved great success over the past few years with their MCL1100 decoding system which provides fully automatic decoding of RTTY, c.w., ARQ, and FEC. The great attraction of the MCL1100 is its ease of use combined with low interference levels, thanks to the well screened electronics. Mike Richards takes a fresh look at the latest MCL1100, paying particular attention to the new Meteo upgrade board.

For the review, Momentum supplied a complete MCL1100 EasyReader package that comprised the following: MCL1100 decoder, plug-top power supply unit, MM901ME video monitor, plus all the necessary connection leads. In addition to the hardware, there was an EasyReader user manual, technical manual and a separate manual for the Meteo Upgrade.

Setting-up has been made extremely easy and requires just three connections to the main MCL1100 unit. The power output from the plug-top power supply connects to the main unit using a standard coaxial power lead. Next comes the receiver audio feed that connects to a standard 3.5mm mono jack socket on the rear panel. The input sensitivity here is around 200mV so it should be suitable for use with most receivers' line-out jacks. This has the advantage of running the decoder from the fixed output so you can adjust the receiver volume without effecting the decoder levels. The final connection is the coaxial lead carrying the composite video to the monochrome monitor. Although these are all the essential connections, there is an extra connection on the rear panel for a standard PC printer. With this connected you can obtain printouts of the decoded data. You can also add an optional RS232 interface so that captured data could be fed to a computer or other serial device for further processing.

Once all is connected and powered-up, you are presented with the start-up menu page which shows all the receive modes and options. Selection of the required mode is achieved using the numeric keypad on the main panel. This keypad proved very reliable in use and featured a good compromise between lightness of touch and positive feel to reduce input errors. It may not be the most elegant of keypads, but it works! When selecting the required receive mode you have to use the STOP button to complete the selection in much the same way as the ENTER key on a computer.

SmartLock

One of the most important features of the EasyReader is the inclusion of what Momentum call SmartLock. In essence, the incoming audio signal is passed through a limiting filter to remove unwanted components such as mains hum and other spurious signals. Once through this basic filtering the signal is applied to the Z8 processor for decoding. As all the decoding is performed in software, tuning becomes less critical as the decoding algorithm will automatically track the signal over a relatively large range. Closely associated with Smartlock is the on-screen tuning indicator. This comprised an up-arrow at the top left of the screen that moved from left to right as the input signal moved across the Smartlock tuning range. For reliable decoding all you had to do was ensure the up-arrow was in the centre third of its movement. An additional feature of the tuning indicator was the way in which it reacted whilst receiving ARQ signals. To indicate that lock has been achieved the up-arrow changes to an X, changing to a * when data is being received.

One of the potential disadvantages of an automatic decoding system is a tendency to keep resynchronising to the signal during poor conditions. The EasyReader copes with this problem through the addition of lock facility that will hold the current operating conditions regardless of the state of the incoming signal. In addition to being able to simplify the tuning process the Smartlock system includes routines to

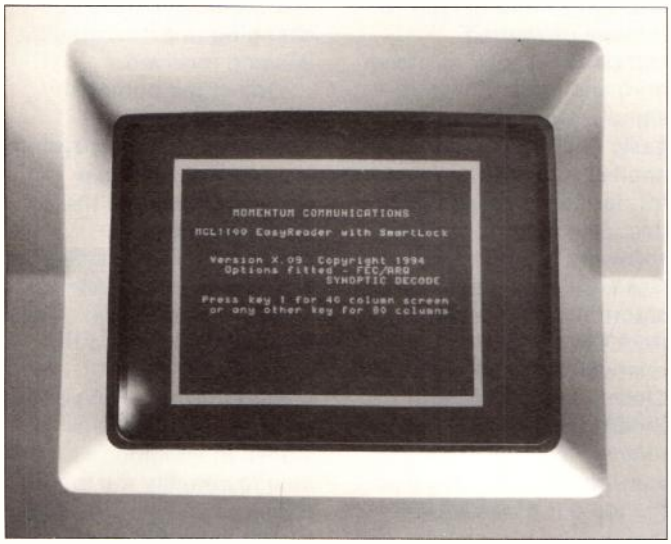
automatically determine both the baud rate and polarity of the received signal. The combination of automatic decoding and simplified tuning make this system particularly attractive to the newcomer. If the letters I receive are a fair reflection of the problems experienced by new listeners, the EasyReader's Smartlock should prove extremely popular.

Status Display

Right next to the main tuning display is a status line that provides information on all the current parameters. The exact format of the status line is dependant on whether the display is set for 40 or 80 line resolution. As you would expect the 40 line display shows a much reduced level of information with mainly single letters and opposed to an abbreviation. The information displayed includes, mode, speed, Smartlock alignment, and printer. There is also an indication of the letter/figure shift setting when receiving RTTY signals.

Decoding

Now that you've an idea of some of the fine points of the EasyReader, let's see how it performs on-air. The supplied monitor (green screen) proved to be very good with a clear display and relatively low r.f. emissions - far better than most colour monitors. Starting with c.w., the EasyReader's automation was very effective and all but the weakest of signals achieved lock within a second or two. There was a tendency for the logic to attempt to resynchronise when dealing with very weak signals, but this could be overcome by switching to manual mode. In addition to the main tuning display, the c.w. mode included a simple data indicator that flashed in synchronisation with the incoming signal. This provides a useful check that you are receiving the correct signal! Moving on to RTTY reception, the EasyReader proved just as easy to use with the SmartLock system providing synchronisation within about 2-3 seconds. However, it is important to note that there are many signals around that sound for all the world like RTTY, but are, in fact, obscure complex modes - so don't expect to be able to decode them all. Although the SmartLock provides excellent decoding for the majority of signals, the EasyReader provides the operator with manual control of baud rates and data polarity. When receiving ARQ/FEC operation is slightly more complex due to the more sophisticated nature of the transmission system. The first point to note is that the EasyReader will only synchronise to an Information Sending Station (ISS) as opposed to a receiving station (IRS). I found that it was occasionally necessary to put the SmartLock into locked mode to speed-up synchronisation. Whilst monitoring ARQ signals you have the option to decode in literal or CCIR476-3 modes. The difference is that the literal mode displays all the characters including control signals whereas the CCIR mode only displays the message text. Whilst the RTTY and c.w. decoding routines were very good, the ARQ mode required a cleaner signal for reliable decoding.



Meteo Upgrade

A good reason for taking a second look at the EasyReader is the introduction of the new Meteo upgrade board. This factory fitted, expansion board provides all the necessary logic to translate a whole range of coded Meteo RTTY signals into plain English. For UK listeners one of the most popular sources of this information has been Bracknell Met on 4.489MHz. Sadly this station has reduced power in recent months, so you may get better service from one of the other continental stations such as Hamburg on 7.646MHz.

One of the main attractions of the data sent by these stations is the fact that you can pick out the precise weather conditions from a wide range of monitoring stations around the world. The service is

particularly popular with amateur meteorologists as they can build-up detailed reports for specific local areas and so build their own forecasts. So much for the background, let's take a look at the EasyReader's implementation. The first thing to note is the wide range of Synoptic modes covered that include TEMP range, SHIP/SYNOP and the PILOT range. Selecting the synoptic mode can either be done from the RTTY mode by pressing [5] or by pressing [41] from the main menu.

I would recommend starting from RTTY as you ought to make sure you have a clean signal before you start trying to interpret the results. A useful facility here is to invoke the EasyReader's TRACE option. This causes the decoder to display the received character together with the literal translation on the same line. Not only does this help check the quality of the signal, but it also gives you a preview of what you are about to receive. The real gem with this implementation of the synoptic decoding is the inclusion of a decode buffer. If you've tried some of the other synoptic systems, such as HAMCOMM, you will have noted that with an incoming data rate of 75 baud, the translated text is displayed too fast to read. In order to use the information you have to save it to disk or printer. Momentum have largely solved this problem with their built-in buffer. This automatically stores the literal translations and displays them at a speed selected by the operator. The speed of display could be adjusted by the operator using the STOP and SPACE keys on the main keypad.

You may have twigged that, if the data is being displayed more slowly than it's being received, there's bound to come a point when the buffer memory will fill. The EasyReader handles this by informing the operator and that decoding has been paused until the buffers have cleared. In practice this didn't turn out to be a significant problem as there were sufficient gaps in most normal transmissions to let the buffers clear without intervention. Should you suffer errors during a transmission the EasyReader just displays a message and attempts to resynchronise to the signal. ■

Specification

Demodulator:	Baudot 45/50/75 baud a.f.s.k. shift 150-850Hz
	ASCII 110/200 baud a.f.s.k. shift 150-850Hz
	c.w. 2 - 99 w.p.m. manual
	2 - 99 w.p.m. auto word search
	6 - 99 w.p.m. c.w. auto mode
Audio In:	3.5mm mono jack
	200mV to 10V p-p in 5kΩ
Video Out:	Phone socket
	Composite video 1V 50Ω 80/40 chrs per line & 25 lines
Power In:	9-13V d.c. at 600mA
Modes:	RTTY, SITOR/AMTOR Mode A & B, c.w., ASCII
Dimensions:	292mm wide x 148mm deep x 50mm high
Weight:	1.1kg
Environment:	10-40C, Humidity 5% to 95% noncondensing
Meteo Modes:	TEMP, TEMP DROP, TEMP MOBIL, TEMP SHIP
	SHIP, SYNOP
	AIREP (ARP/ARS)
	PILOT, PILOT MOBIL, PILOT SHIP

Summary

The EasyReader is certainly a well thought out systems that's particularly suitable for those new to decoding. The RTTY and c.w. decoding algorithms supporting SmartLock were very robust and provided good results for all except very weak or noisy signals. The real gem was the buffered synoptic decoding that worked extremely well and opens up a new source of fascinating data for many listeners. The complete package as reviewed with main unit, monitor and Meteo upgrade costs **£449.95** plus **£15.00** next day delivery. Individual parts are available at **£375** for the main decoder plus for the **£69.95** video monitor. the Meteo upgrade costs an additional **£129** inclusive of factory fitting. **Momentum** can be contacted at **6 & 7 Clarkson Place, Dudley Road, Lye Stourbridge, West Midlands DY9 8EL. Tel: (01384 896879)**. My thanks to Momentum for the loan of the review model.

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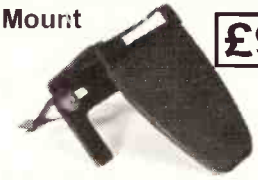

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Cub Counter	£389.95

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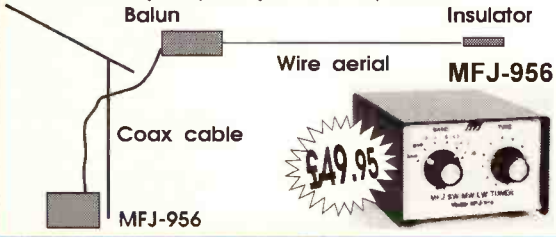

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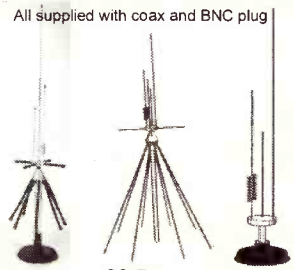

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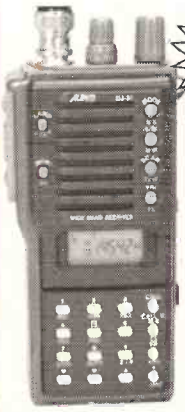

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Let Me Put You on a Pedestal Or Whatever Happened to the RF Gain Control?

Time was when any communications receiver worthy of the name had a knob labelled 'RF Gain', and any operator who used it knew what it was for. John Wilson discusses the demise of this valuable control.

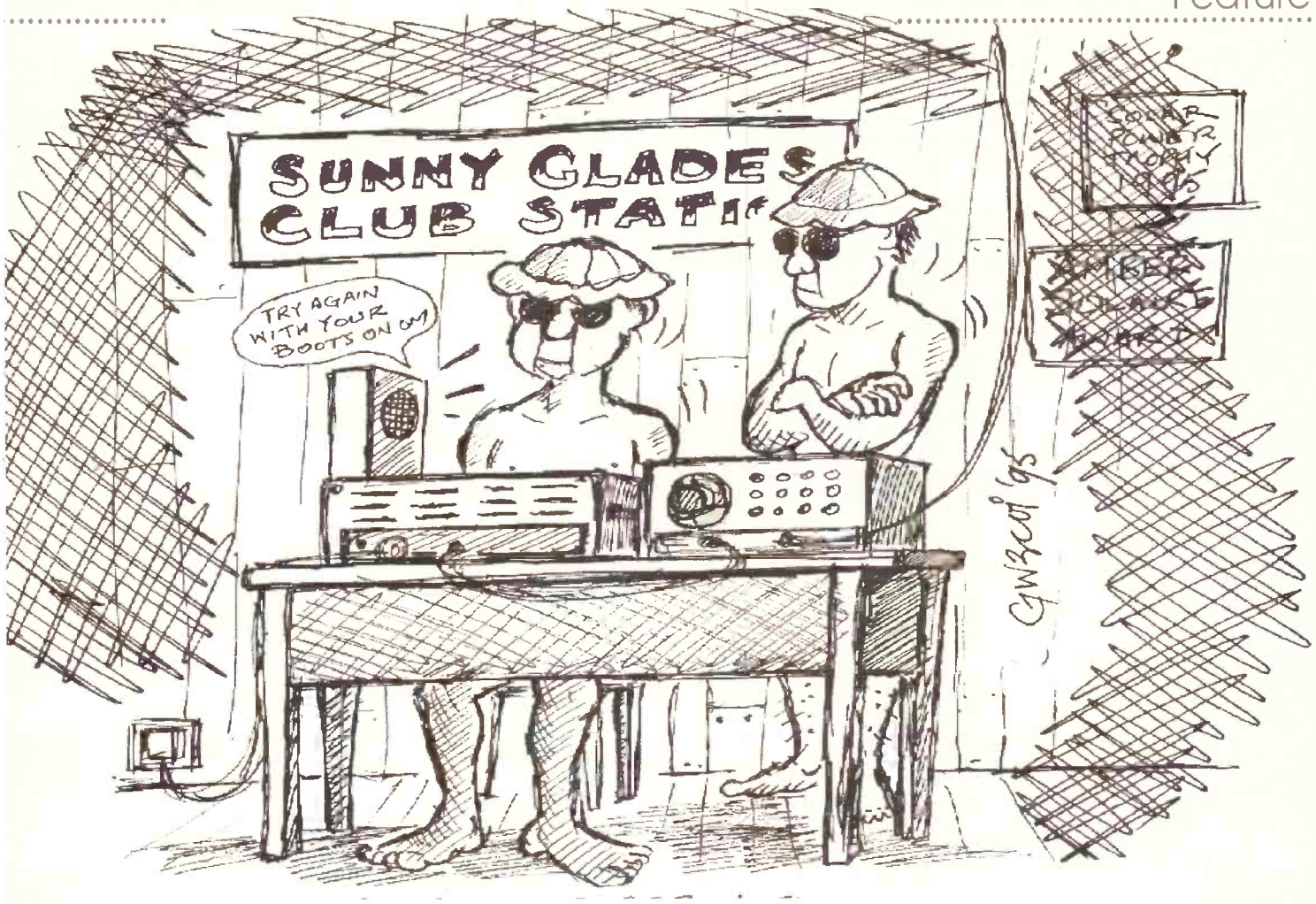
How times have changed, and there are now receivers around which have dispensed with the ubiquitous r.f. gain control, and there are users (I won't say operators) who in any case wouldn't know what to do with one if they had it. Let me put my case more strongly:- In my view, any receiver intended for use by a short wave listener, particularly for s.s.b. reception, will at some point prove unsatisfactory if it does not have an r.f. or i.f. gain control. Indeed, I would go so far as to say that such a radio does not qualify as a 'proper' h.f. receiver except for a.m. broadcast listening. Those of you who know how to use an r.f. gain control when listening to s.s.b. or c.w. will appreciate what I mean, but for those uninitiated in the ways of good receivers, let me try to teach you something you may not know (as the Mandarin said to the Minister).

Average Receiver

The average receiver has to have enough gain to amplify signals of less than a microvolt at the antenna socket to a level which you can detect and hear in a loudspeaker or headphones. Just how much gain is needed depends to some extent on the frequencies where the receiver is used, and although there is little point in having high sensitivity on the tropical bands (2 to 4MHz), at higher frequencies it is useful to have a receiver sensitivity of better than half a microvolt to give a readable output to the loudspeaker. The reasons for these changing sensitivity requirements can be covered in a later article, but for the moment let me stay with the 'RF Gain' control.

"Ere Mabel, I thought 'e was telling us about r.f. gain, and 'ere 'e is waffling on about a.g.c."

If you have a receiver with sufficient sensitivity to give a readable output from half a microvolt of signal, what happens when you tune around and come across a signal which generates 100µV into the antenna socket - you blow your head off with noise, and although some of our younger generation seem to enjoy premature deafness from listening to pop music, perhaps the short wave listener would like to retain a modicum of hearing into at least middle life. Of course, most superhet receivers employ an automatic gain control (a.g.c.) system to control the gain, and those of you in the FOUL (Few Of Us Left) Club who appreciate these matters will know that a reasonable a.g.c. system will hold the audio output from a receiver constant within about 3dB for antenna input signals changing between 1µV and 1mV, so where is the problem? Let the a.g.c. system cope with it. Well, that's fine for a.m. signals where the a.g.c. generally works on the constant (apart from fading) carrier, but what happens in the case of signals where there is no carrier on which to hang the a.g.c. system? I'm talking about single sideband (s.s.b.) communications channels which is what you will find if you want to listen to utilities such as aircraft h.f. links or ship to shore traffic. With an s.s.b. signal, when the fat lady stops singing there is no signal at all. Therefore, your receiver a.g.c. system thinks to itself "If there is no signal, then my job is to increase the receiver gain", and it does this quite



"...one of the regular s.s.b. sets..."

rapidly, increasing the background noise from the antenna until the receiver is back at full gain. If in the meantime the fat lady has started singing again, the a.g.c. winds down the gain to restore the audio output to normal. If the a.g.c. system has a fast attack and decay characteristic, the receiver audio output will pump up and down between speech syllables as the a.g.c. tries to keep the levels constant, and you then get the effect which you can sometimes hear on news reports from far off places where the correspondent's voice tries to punch holes in the prevailing background noise. The 'pumping' effect also occurs where the receiver has audio derived a.g.c., which is a method of obtaining the automatic gain control from the audio of the demodulated s.s.b. or c.w. signal rather than the i.f. signal, because when speech stops there is no demodulated audio and the receiver gain increases. *"Ere Mabel, I thought 'e was telling us about r.f. gain, and 'ere 'e is waffling on about a.g.c."*

In a typical receiver, the a.g.c. for the s.s.b. mode , whether i.f. or audio derived, would have a rapid attack and slow release characteristic which would help to stop the receiver restoring to full gain between syllables, but however carefully the designer chooses the a.g.c. decay time and the slope of the release curve, sooner or later the fat lady stops for breath and the receiver roars back up to full gain. And so to the point: If instead of the receiver galloping to full gain we had a front panel control to reduce the overall gain to the point where it is adequate to listen to the wanted signal comfortably, but not so much as to amplify the background noise, our ears would have an easier time. In other words a variable r.f. or i.f. gain control allows the user to reduce the range over which the a.g.c. system operates and thus reduce the background noise between speech syllables.

That, dear reader, is what an r.f. gain control can do for you, and despite all the cleverness of the a.g.c. designers, having a variable gain control under your hairy fingers makes a big difference to the comfort of listening to s.s.b. or c.w. signals. In the case of c.w., the really experienced operator usually prefers to switch off the a.g.c. altogether and rely on the r.f. gain control to keep the incoming signal riding above the noise.

From the mists of time it came...

However, not all knobs labelled 'RF Gain' do the same thing, and don't let anyone tell you that an r.f. attenuator is the same animal as a classic r.f. gain control because it isn't. Back in the mists of time when receivers got warm to the touch, and I mean the warmth from valves rather than the heat from some modern receiver power transformers....., the valves used for r.f. and i.f. amplifier stages had what was known as a 'variable-mu' characteristic. This meant that controlling the bias applied to the control grid changed the actual amplification factor of the valve (its gain), and since in standard designs the valve obtained its bias from a resistor in its cathode, making that resistor variable provided an easy method of controlling the stage gain. If the valve was being used as an r.f. amplifier, this gave variable r.f. gain, and if used as an intermediate frequency amplifier you had variable i.f. gain. Sometimes you would have separate front panel controls for r.f. and i.f. gain but many receivers used the simple technique of connecting two or more gain controlled stage cathodes together and using a single variable resistor to simultaneously control r.f. and i.f. gain. With the advent of solid state devices, the same technique was often

used by making the source resistor of an f.e.t. variable, but the results were sometimes as variable as the resistor and often highlighted the fact that the thermionic valve had become a very advanced device in its years of development since Dr. Lee de Forest first put a control grid in an electron stream in 1907. In any case, by the time the semiconductor appeared, r.f. gain control systems had changed significantly.

Remember that the receivers I am describing had automatic gain control as well as manual r.f. or i.f. gain adjustment, and the a.g.c. also operated by applying variable bias voltages to control elements in the valve or semiconductor. In effect the a.g.c. and the r.f. gain control bias were additive, a standing bias being produced by the front panel gain control and a changing bias coming from the a.g.c. system. I don't know which designer realised that having designed an a.g.c. system to control the overall r.f. and i.f. gain of a receiver it would be relatively simple to feed a variable bias into the a.g.c. network to give front panel control of receiver gain which was truly additive to the a.g.c. but I originally thought that it must surely have been Art Collins. I was wrong, and it may surprise you to know that the dear old AR-88 used this system of r.f. gain control, feeding the negative control bias on to the a.g.c. line through a diode gate (the slightly earlier AR-77 used the variable cathode resistor approach). Does anyone know of an earlier example?

Since American designers were in the development driving seat at this time it is interesting to find that Hallicrafters and Hammarlund followed the cathode control of r.f. Gain, and even Collins used it in the 75A-1. However, by the time the 75A-4 came out, Collins had changed to using the a.g.c. line as the method of applying r.f. gain control, as had Drake, right from their first receiver the 1-A. This then was the system used in receivers such as the Collins 51S-1, 75S-3, Drake R-4, Hammarlund SP-600 and others of the same period - an era which I and many other people regard as the golden age of h.f. receiver design: but I digress.

"The Bells, the Bells, Esmerelda"

For those of you who are by now a bit lost in the tangle of words I've thrown at you, let me try an analogy. Imagine that you want to listen to the sound of church bells coming from a spire a hundred feet above the ground, whilst at ground level there is the constant noise of traffic which drowns out the sound of the bells. Fortunately you have a friend operating a tower crane close by and you can stand in a bucket and be lifted out of the traffic noise to a height where you can hear the bells more clearly. Unfortunately, every time the peal ends, the crane drops you right down into the traffic noise, and then hoists you rapidly up at the start of the next peal. That's effectively what the a.g.c. system of a receiver is doing when it tries to restore full gain between speech syllables. Now imagine that as you stand in the crane bucket you have full manual control over the crane and can adjust the height of the bucket so that you are out of the ground level noise and sitting in the clear air, level with the bells and listening in peace. That's more or less what a manual r.f. gain control does - it lifts the listening point of the receiver, reduces the background noise, and leaves the signal you want in the clear. Because the control function is carried out by applying a steady bias to the a.g.c. system, it places the wanted signal on a fixed 'pedestal', and this is the term most often used for the particular method of gain control I have described. A major feature of the 'pedestal' approach is that if the wanted signal increases above the pedestal, the a.g.c. system still operates and holds the receiver gain constant at or slightly above the pedestal level. The effect is remarkable, and if you haven't enjoyed listening to s.s.b. signals in this way, find a receiver which has a proper r.f. gain control and give it a try.

When is an RF Gain Control not an RF Gain Control?

Answer: When it doesn't control gain, and if that seems silly let me refer you to the 'Century 21' receiver, also variously labelled as the SRX-30 and other aliases. The 'RF Gain' knob on these receivers (and others I could name) is actually a potentiometer connected across the antenna input socket and therefore doesn't control gain, merely the amount of signal reaching the r.f. stage of the receiver. It's not one of nature's grandest designs:- put up a nice long antenna to get big signals into the radio, then stick a resistor in the way to cut them down again! But isn't that what we do when using an r.f. attenuator?

There are some receivers, admittedly designed more for the a.m. broadcast listener, which do not have any form of manual receiver gain adjustment and rely on the a.g.c. system alone to keep the audio output constant. However, for reasons already explained this does not work well for s.s.b., and when such a receiver is being hit by big signals the only control available to the user is an r.f. attenuator. Sometimes the attenuation is a single fixed step of, say, 20dB and sometimes several steps are provided. The snag to this approach is that the r.f. attenuator reduces the unwanted noise and the wanted signal by the same amount, and the end result is that whilst initially the perceived signal to noise ratio of the signal remains the same, as more attenuation is used the signal begins to disappear into the internal noise of the receiver which is now operating at full gain, the a.g.c. system having cranked it up, and the signal to noise ratio gets worse and worse, quite unlike the effect of an r.f. gain control. However, that's not the whole story:- it seldom is.

There are many top class receivers around which have front panel switched r.f. attenuators, for example the Kenwood R-5000 or the JRC NRD series, or attenuators selected by front panel function buttons such as the Drake R-8A and most Icom receivers, but it would be incorrect to take my remarks in the previous paragraph and apply them to such units because these receivers also have front panel r.f. gain controls operating on the 'pedestal' principle. In receivers like these the r.f. attenuator is used for its correct purpose which is to move the effective dynamic range of the receiver up and down the range of encountered input signals so as to minimise the effects of intermodulation generated

There are many top class receivers around which have front panel switched r.f. attenuators, for example the Kenwood R-5000 or the JRC NRD series.

"...only two people in the universe..."

within the receiver (but that's another subject). The r.f. gain control is still the knob reached for by the experienced operator when listening to s.s.b. transmissions, and when physically combined with the a.f. gain control by making them dual concentric, the ease with which the user can control the listening quality is quite noticeable. Some Eddystone owners who are fortunate enough to have separate r.f. and i.f. gain controls can become somewhat confused at this point, so why not give your surplus gain control to some poor fellow who hasn't got one?

I've got one; what do I do with it?

If you have a receiver with a 'proper' r.f. gain control on it and you haven't bothered to move it away from its fully clockwise position, why not tune to one of the regular s.s.b. nets on the 80 metre amateur band (tune around 3.740 to 3.780MHz) and back off the r.f. gain until the signal to which you are listening is in the clear with the band background noise reduced to a low level. If your receiver has a signal strength meter driven from the a.g.c. system as most of them are, rotation of the r.f. gain control will probably cause the meter reading to increase from zero. This shows the effect of the 'pedestal' being applied to the a.g.c. network, and the aim is to get the meter reading to be just less than the peak signals you want to hear so that they are sitting on or close to the pedestal. I do recall receiver owners complaining to me about the meter reading increasing with r.f. gain control adjustment, but in fact it's a positive feature and far from being a drawback. You see, if it all works properly, the incoming signal will still be correctly measured on the meter if it appears just above the pedestal.

There's Always One Who Wants to be Different....

Some receivers will not conform to my simplified explanations of an r.f. gain control, and we have historic examples such as the HQ-170A which employs two mechanically coupled potentiometers of different value controlling r.f. and i.f. stages; or the 1940s BC-348 which in some versions (there were many), ganged together r.f. and audio gain controls; or the NRD-505 from JRC which had without doubt the most complex set of interlocking pre-set gain controls I ever encountered, and which only two people in the universe apart from the designer ever understood. There are no doubt countless more, and out there my fellow members of the FOUL Club will be sharpening their pencils to tell me about them. The fact still remains that even today, in our technologically advanced equipment (or is it?), the provision of some means of manually controlling the r.f. or i.f. gain of a receiver is an absolute 'must' if the user wants to get the best out of s.s.b. listening.

One last request, apart from a hearty breakfast and a visit from the Chaplain; I am trying to put together a library of equipment handbooks and circuit information so that I can extend my researches into equipment design and help other people with their queries. If you have any old handbooks for receivers of any period, even modern(ish) units, I would be very glad to hear from you. Just drop me a note c/o *Short Wave Magazine* or call me on (01271) 858430 and I will be pleased to hear from you. ■

By the time you read this we will be the start of 1996 and I would like to thank all the people who have written to me from all over the country, asking for advice, commenting on my articles, suggesting topics for future coverage and just being downright friendly. I am amazed at the wonderful variety of subjects covered in your letters and feel reassured that the hobby of short wave listening is very much alive and well. Let's keep it that way by remembering that it is, after all, a hobby. I also want to congratulate Dick Ganderton and all the staff at *Short Wave Magazine* for producing such an excellent publication and covering so many listening interests within the overall hobby scene.

Have a happy 1996.

John Wilson

Solar Radio Astronomy

Ron Ham describes the radio astronomy experiments that he conducted from his 'radio observatory' on the north face of the South Downs.

The ideal world for a radio astronomer would be one without interference from television timebase whistles, ignition systems, thermostats and the multitude of terrestrial radio signals that travel through the earth's atmosphere every hour of the day. Such a situation could be recreated if it were possible to take one of today's sensitive communications receivers, with a suitable antenna, back 200 years and use it. At switch-on, before connecting the antenna, the gentle 'twitter' of receiver background noise would come through the loud-speaker.

Couple the antenna and 'noise' from thunder storms and celestial sources, like Cassiopeia and Cygnus or, nearer home, our sun and the planet Jupiter would be heard. Lightning would produce frequent sharp 'cracks' depending upon the distance of the storm and, because there is no man-made noise, the radio-waves from more distant stella objects could be studied over a wide range of frequencies.

Sunspots

Today, most radio operators are aware of the relationship between solar activity and disturbances to terrestrial communications. Experience tells us that when sunspots are present the sun can eject streams of charged particles toward the earth and, at the same time, emit powerful radio-waves, **Fig. 1a**. The particles may take up to 40 hours before reaching the earth's orbital path whereas the radio waves, which move at the speed of light, can be detected on earth just 8.3 minutes after leaving their source of origin on the sun. The detection of solar radio-waves is an early warning that an event, possibly a flare, has occurred and, if the timing is right, the particles may create an aurora, **Fig. 1c**, in the earth's polar atmosphere and/or damage the ionosphere, **Fig. 1b**, to such an extent that terrestrial radio signals rapidly fade or are lost altogether. Aurora and ionospheric disturbances can last for several hours.

Archives

Evidence exists that all this was known some 60 years ago when scientifically minded short wave enthusiasts logged any unusual happenings and sent their reports to the specialist writers in magazines like *Practical Wireless*, *RadCommunication*, *Short Wave Magazine* and *Wireless World*. For instance, in the mid-1930s, the late Miss Nell Corry, became author of a monthly column in the RSGB's journal. Her writings were based on the daily information that she received from wireless-operators around the world. These reports were kept in a set of five diaries ranging from January 1936 to May 1940. Before her death she kindly gave me these diaries which, after analysis, I deposited in the Vintage Wireless library at the Chalk Pits Museum (Amberley, West Sussex). These diaries revealed that the late Mr. Dennis Heightman (Clacton-on-Sea) and a number of other short-wave enthusiasts were among the first to hear and recognise radio-waves coming from the active sun. Both Miss Corry and Mr. Heightman told me that it sounded like 'hissing' above the background noise of their receivers. They noted that the 'hissing' always occurred during daylight hours and prior to reports of aurora and ionospheric disturbances. One of the astronomical contributors to Miss Corry's column was a Mr. Newbiggin who also observed sunspots at his observatory in Worthing.

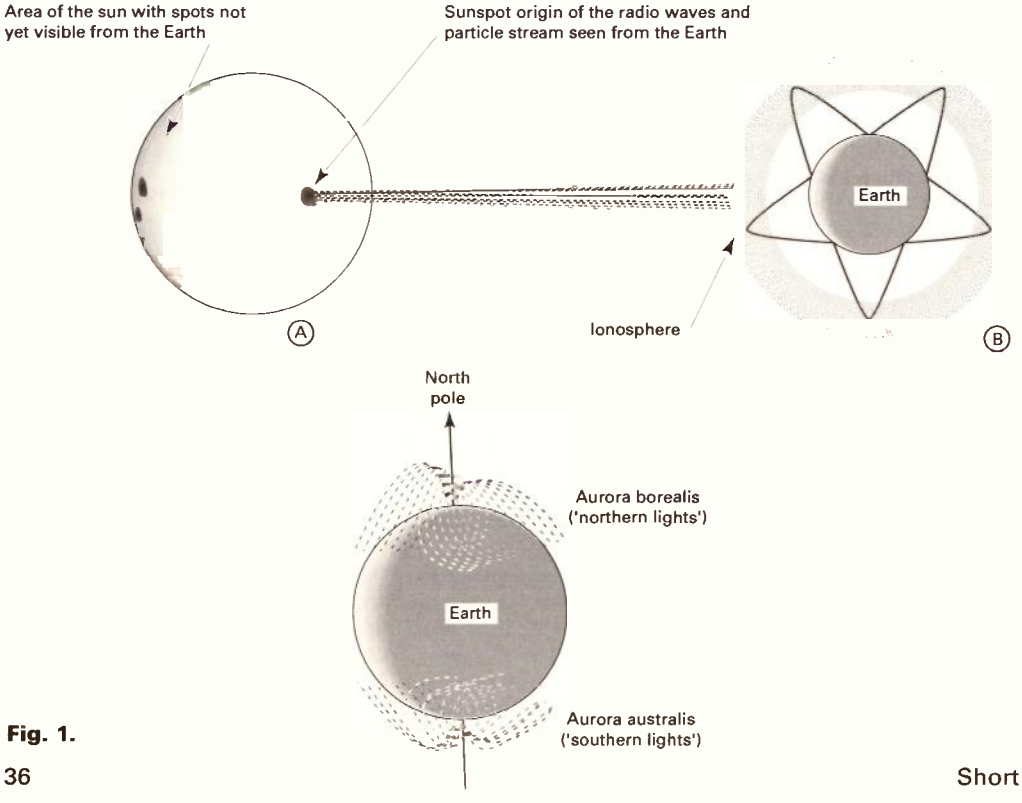


Fig. 1.

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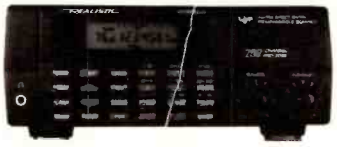

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CONTINUED FROM PAGE 36

Solar Radio Waves

As an 'armchair' astronomer, the solar system was among my special interests and, as a radio-engineer, the thought of detecting radio waves from a celestial body, 93 million miles away, appealed me. So, from 1968 to 1984, I observed the sun for three hours each day (approximately 1130 to 1430) with a simple radio-telescope, **Fig. 2**.

Before building such a tool I had to find an observational frequency that was clear of terrestrial and satellite signals plus a south-facing site on which to install the antenna. After prolonged tests with a converter and dipole I found that 135.95MHz met the first requirement and by watching the sun's path I decided that the southern end of my garden was suitable for the second. **Fig. 3** shows the 136MHz antenna in its winter position when the sun was low in the sky and **Fig. 4** shows it at a steeper angle later in the year. The antenna on its left feeds another solar telescope working on a lower frequency.

Equipment

The simple radio telescope that I built in 1968 had a dedicated antenna, **Figs. 2(A), 3 & 4**, a 136MHz to 26MHz convertor mounted behind the antenna, **Fig. 2(B)** and upper left **Fig. 6**, a communications receiver, tuned to 26MHz, as the intermediate frequency amplifier, **Fig. 2(D)**, a d.c. amplifier, **Fig. 2(E)**, a pen recorder, **Fig. 2(F)** and a good supply of chart recording paper. Briefly, the 26MHz signal was carried underground between the convertor and receiver via a good quality coaxial cable, **Fig. 2(C)**. The altitude of the antenna was adjusted about five times per year to keep the sun within its vertical beamwidth and its azimuth was carried through the path of the sun by using the daily rotation of the earth on its axis.

When working, the gentle 'twitter' of the receiver's background noise increased rapidly when the radio waves arrived from the sun. I found it best to 'zero' the pen-trace with a control on the d.c. amplifier. The input of this amplifier is connected to the receiver's detector and its output to the pen-coil on the recorder.

First Hand Experience

After hearing solar noise through the telescope's loud-speaker I can confirm that the Corry/Heightman description of 'hissing' and text-book statements such as, "it sounds like the sea rolling across the shore ('seashore effect')" and 'whoOOoshing' over a wide range of frequencies is absolutely correct.

I commenced daily solar observations, at 136MHz, in May 1968 and by the end of 1969, I had recorded a number of individual bursts of solar-noise, as drawn in **Fig. 5** (Nov. 11) and a few continuous noise storms similar to the trace in **Fig. 5** (Nov. 14). During that period I learnt that solar bursts had a life ranging from seconds to about 10 minutes whereas a storm could rage from a few hours to several days.

Sometimes when an 'active' sunspot appeared on the East-limb of the sun there would be a few random bursts which would become more frequent over the next couple of days. Then a storm would develop, reach its peak as it crossed the sun's central meridian and gradually decrease and return to isolated bursts before disappearing off the Western edge. Should a sunspot or group live long enough, its return, due to solar rotation, could be expected some 13 days later. There may also be new active areas, unseen from earth, **Fig. 1(A)**, which will eventually come into view.

Some Spectacular events.

A major storm began on March 1st, 1970, with a general increase in the noise level intermixed with large single bursts and ended on the 8th with a spell of even larger bursts. The noise remained slight on the 2nd and the 5th but was intense on the 4th. One effect from this solar activity was the aurora-borealis which manifested between 1600 and 2200 on the 8th. Apart from its colourful beauty an aurora is an area of temporary ionisation which will deflect and reflect v.h.f. radio signals over abnormally long distances. This can be observed by pointing a yagi type antenna toward the North and periodically tuning through the v.h.f. bands when the sun is active. Auroral reflected Morse code takes on a low pitched rasp, s.s.b. signals sound like ghostly voices and distant broadcast stations just 'burble'. On one occasion, from my home in Sussex, I received auroral reflected signals from a number of East-European broadcast stations in Band I (45 to 80MHz) plus distorted television pictures from the IBA's Band III transmitters in London and on the Isle of Wight. This shows that aurora can be detected without being seen. Before the advent of radio untold numbers of auroral events must have gone by unrecorded because they manifested when the skies were overcast, the moon too bright or during the daylight hours.

The Noisy 16th

In 1970, my instrument recorded some form of solar activity each day from October

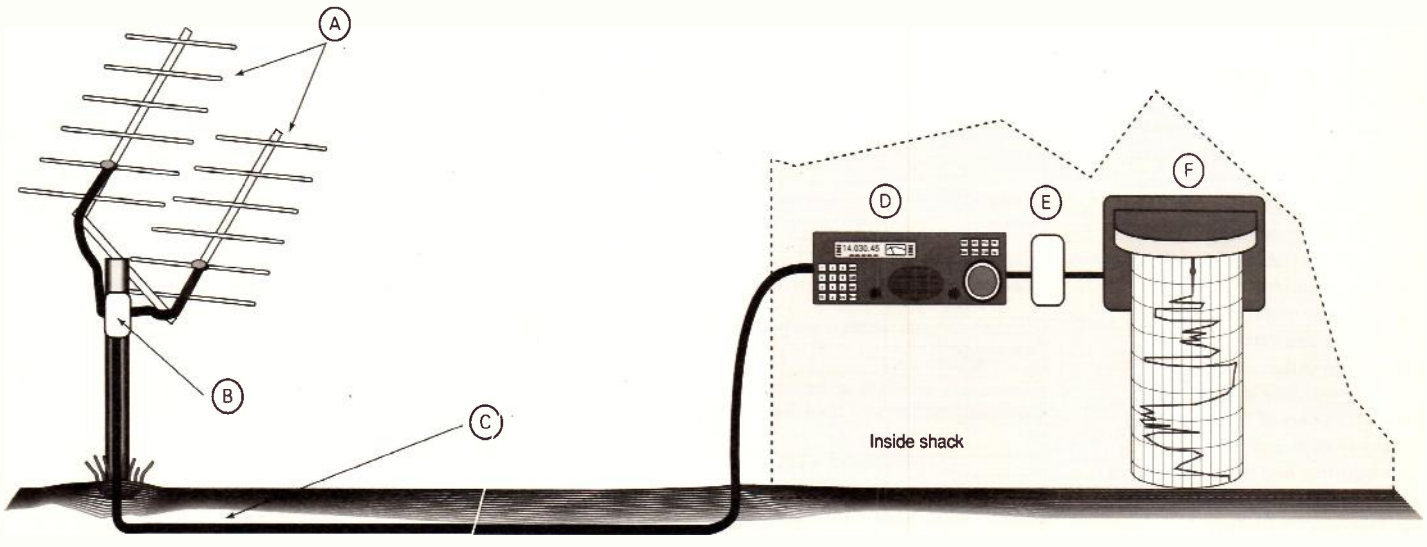

Fig. 2: The layout of the radio telescope.

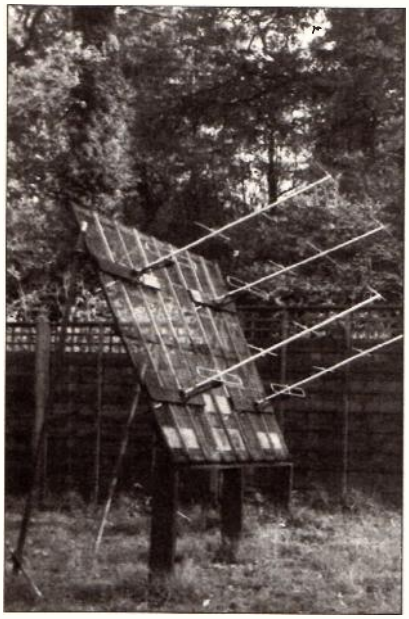

Fig. 3: Ron Ham's radio telescope antenna array.

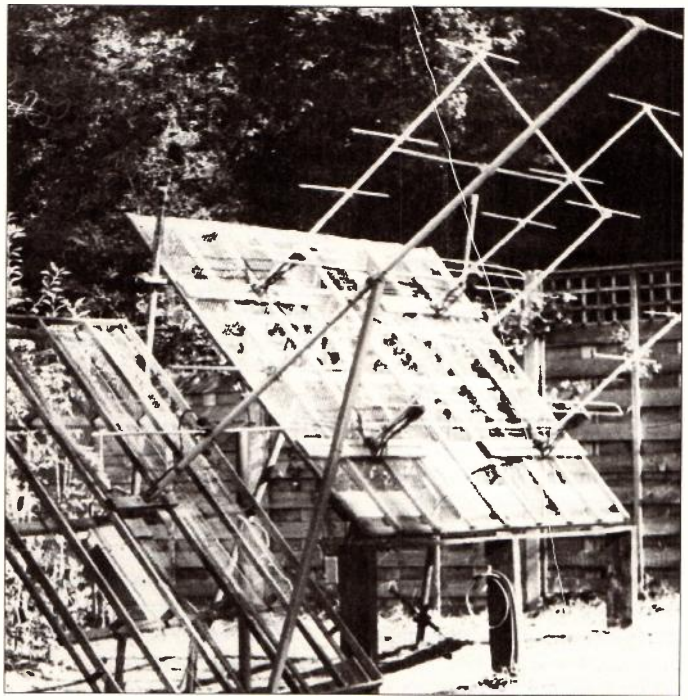

Fig. 4: Later version of the antenna array.

9 to November 5 including an intense noise storm from October 27 to 30 inclusive. The sun was then relatively 'quiet' until November 11, **Fig. 5**, when a few tiny bursts appeared on the recording chart. Next day the solar noise level gradually rose and fell as the sun travelled, by earth-drift, through my telescope's antenna beamwidth. When the instrument switched on automatically on the 13th a noise storm was already raging and the recording pen was well above the 'quiet' base line. The storm increased in strength on the 14th and 15th, peaked, with the recording pen hard against the upper stops, on the 16th, 17th and 18th, decreased to about 60% on the 19th and 20th and ended with a few tiny bursts on the 21st. During this period there were several short-wave fade-outs and blackouts.

However, after sunset on the 16th the background noise level on these bands was unusually high as though the ionosphere was re-radiating after its excessive battering with solar particles.

A colleague suggested that it could be the moon deflecting the solar noise towards the earth, why not?, after all the sun was still pumping the particles out.

We will never know the actual cause of this amazing natural event, although something like this must have happened many times before in the earth's history.

I have indicated where I think the active sunspot group was on each of the solar diagrams at the right of **Fig. 5**.

According to a report in the *Daily Telegraph* at the time there were four sunspot groups visible and the largest of them contained about 20 spots. These others may also have contributed to the solar radio noise being recorded throughout that week.

Exciting Years

Several major solar storms were recorded during 1972, resulting in memorable aurorae on June 18 and August 4 and 5 and a short wave blackout on November 1. At midday on April 1, 1973, a fellow engineer heard solar radio noise on his short-wave receiver while my telescope recorded a couple of individual bursts. The next indication that something had begun was the two-phase aurora which manifested between 1600 and 1800 and 2000 to after midnight. During each period, with a Yagi facing North-East, I detected 'burbling' signals from those East-European broadcast stations being reflected from the aurora. On the 2nd, 3rd and 4th, I recorded a mixture of solar noise and bursts before the main storm began on the 5th.

World Wide Effect

While a solar storm was in progress on October 30, the BBC's World Service warned their listeners that ionospheric disturbances were causing poor reception. They issued similar warnings on September 14, 15 and 16, 1974, during a period of intense sunspot activity. On July 2 that year, I recorded severe solar noise which was still very strong early on the 3rd. Fortunately I was checking the effect of this storm with other equipment when a massive and scientifically rewarding burst, lasting about 8 minutes, 'jumped' out from the prevailing storm. But let the entry in my log explain.

"0832, burst of radio noise 136MHz, gradually getting stronger and it spread down past 70, 50 and 30MHz to 8MHz. It remained strong on all these frequencies until 0836 when it slowly worked its way back up and died out at 136MHz at 0839. Whilst this burst was in progress, the solar noise drowned out all signals between 8 and 20MHz."

This was a case of being in the right place at the right time with the right equipment ready to use. While this storm was in progress solar noise was heard at 28MHz on the 2nd, 3rd and 6th and at 50 and 70MHz on the 3rd and 6th, aurora manifested on the 4th and 6th, a short-wave blackout was noted on the 4th and World Service reported ionospheric disturbances on the 5th, 9th and 10th.

Because the word 'severe' is written against the solar storm entries in my log for September 15, 16 and 18, there was little surprise when an

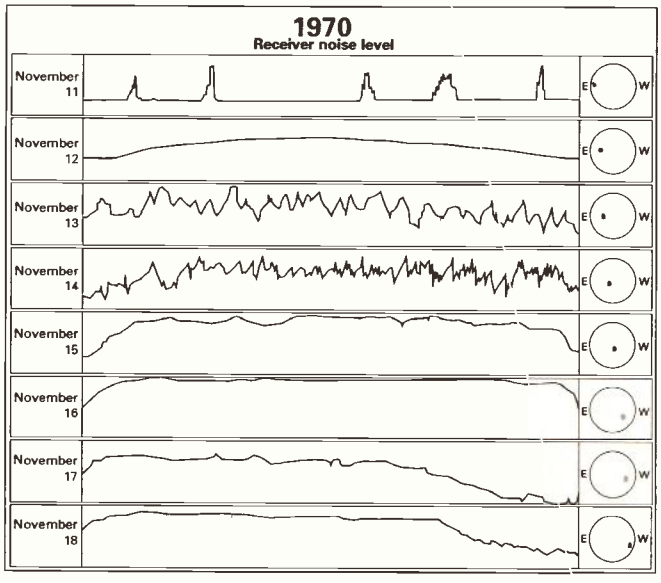

Fig. 5: Chart recordings for part of November 1970 taken by the radio telescope.

aurora, lasting several hours, manifested during the afternoon of the 15th. At midday on October 13, after several days of solar activity, signals from an OSCAR satellite took on an auroral tone as it crossed the North pole. This aurora ended around 1715 and during that event I again heard reflected signals from the East-European broadcasters. However, the reflection area for most of them seemed to be due North but toward the end of the aurora they were peaking in the North-East. This is a good example of how the movement of auroral ionisation can be plotted by radio.

The Familiar 'Hiss'

The following observation will emphasise the importance of monitoring the sound while a radio telescope is running. Around 0830 on August 22, 1976, I heard a very strong burst of solar noise on 28MHz which I duly noted in the log. I spent the rest of that day on exercise with the Air Training Corps and, as a signals instructor, I had a v.h.f. radio-telephone fitted in my car. In general, communications between all units operating on the South-Downs and back to our HQ were fine, but, at 1158, I was unable to hear the reply to my call because the incoming signal was obliterated by a sudden outburst of very strong noise. It was a good 10 minutes before our channel cleared and although I only had a rod antenna on my car roof, that familiar sound told me that the noise came from the sun. I checked my telescope's recording chart when I got home and found a spectacular trace of this particular solar burst which had lasted for 16 minutes on 136MHz. Later, a colleague told me that he heard it for about 30 minutes on 28MHz which again proves that solar radio noise can spread over a wide area of the spectrum. ■

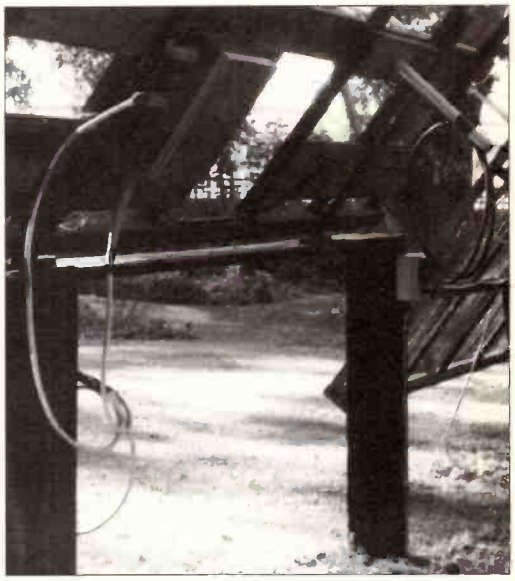

Fig. 6: The 136MHz to 26MHz convertor mounted behind the antenna array.

Radio Astronomy For The Amateur

At first sight, it might seem that anything to do with astronomy has little to do with amateur radio. However, like most sciences these days, there is a big overlap between the sciences, one to another, and this is certainly true with radio astronomy. Arthur Gee G2UK suggests that schools and clubs would find some interesting projects related to this subject.

You will find that many Radio Clubs have a Radio Astronomy item on their winter lecture program these days, which suggests that radio astronomy is steadily making its way into amateur radio. Readers of *Short Wave Magazine* will of course be aware of the connection through the regular articles by Ron Ham on Propagation.

The most obvious astronomical phenomena is, of course, the effect that the sun has on radio propagation. Sun spots, flares, coronal holes and the eleven year sunspot cycle. Quite a number of short wave listeners and radio amateurs and educational establishments do keep regular solar observations using quite elaborate equipment, but one does not have to have very hi-tech equipment to participate in these observations.

A practical system can be set-up by the amateur with the usual amateur radio equipment to receive the actual radio signals emitted from the sun. All one needs is a fairly simple radio antenna, a receiver to cover the frequencies around 136MHz and some recording equipment - such as a pen recorder.

The antenna can be of the Yagi type, easily home-built or obtainable from radio stores. Suitable u.h.f. converters for the 136MHz band are also readily available. For signals from the sun, a dish antenna is not necessary, though if one is available it would be very acceptable. A minimum dish size of about 2m diameter is advisable.

Such a set-up can also be used to receive radio signals from Jupiter, as these are very strong signals. There are, of course, very many other sources of radio signals in the Universe, but these are very weak indeed, compared with those from the sun and from Jupiter. Much more elaborate equipment is needed for these. Large antenna systems, pre-amplifiers, very sensitive radio receivers and elaborate recording systems are absolute necessities for receiving these signals.

Science Project

The sun's radiation provides a good constructional and science project for schools and radio clubs and also makes an interesting radio/astronomical demonstration for pupils and 'open days' for the public. They help to show that amateur radio has a useful educational side as well as being just a means of communication. For those interested in constructional and experimental projects, radio astronomy provides a wide field of interest.

What can one hear? An intense rushing sound, way above the background noise of the receiver, is an indication that you are 'on target'. Fed into a pen recorder, a trace will be recorded with peaks and troughs indicating the fluctuations of the sun's emissions. Nothing terribly exciting you may think, but it is interesting and exciting for those who want to try something new in their hobby.

The most difficult item of equipment needed is the pen recorder. You may be able to find one at a rally or other source of surplus equipment. A new one is very expensive! However, there was an excellent series of articles in this magazine on the construction of a very useful pen recorder. (May to September 1993.

A convenient kit of all the mechanical parts is available from the author of this series of articles. This would provide a very useful topic for school science projects, with construction of the antenna, radio equipment and pen recorder, from which useful and interesting recordings could be had. ■

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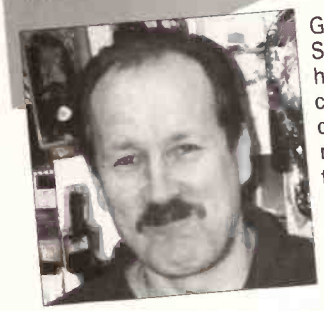

Graeme or "Mr Scanner Man" as he's known to his colleagues is a confirmed scanner nut. It is rumoured that there are monitoring facilities in almost every room of his home, including a scanner in the loo! Graeme is a licensed amateur and like most of the Lynch Mob has been involved with the hobby since his childhood. His forte is scanning products and their associated accessories. Give him a call today.

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Forecasting The Next Sunspot Minimum

As an active listener for over three decades ***D A Whitaker*** *has seen several solar cycles come and go. Here he attempts to apply some logic to the whole affair.*

As most avid listeners will know, Spring 1994 showed a marked drop in propagation conditions on the h.f. bands. This is by no means unusual at this time of the solar cycle. But having had six years of pretty good band conditions, this sudden drop seemed to hit everyone rather hard! So, lets see what has happened.

I have been a fairly active s.w.l. for over 30 years. But I have to admit I have found current falling conditions more dramatic than in previous solar declines. I therefore thought I would check for myself just how far the present sunspot cycle has reached. I have then attempted to pinpoint a month when the cycle will reach its minimum.

For past solar information I have taken actual solar flux numbers as recorded in various radio magazines and news sheets. By taking this data I have been able to establish the time when the flux reached its minimum.

Solar Flux

At this point, I had better explain what the term 'solar flux' means. This definition has again been taken from earlier radio magazines, to which I am grateful.

Solar Flux is a measurement of the noise the sun emits on 2.8GHz - a sort of 'S'-meter reading. We have always figured that this frequency was selected largely because of the availability of surplus 10cm radar receivers and antennas when these measurements began in 1946.

The solar flux figure ranges from a value of over 300 at the peak to below 70 at the bottom of the sunspot cycle. The flux varies almost as directly as the sunspot number.

A solar flux of 300 equates to a sunspot number of 365 and a flux of 67 is close to a sunspot number of zero. So, having given everyone an idea of what I am writing about, I shall continue!

As I write this article - in mid September 1994 the present solar flux has begun to level out at around 80. So, one may assume we could be seeing the bottom of the current sunspot cycle (number 22) shortly. Sorry folks, you are wrong! A sunspot cycle usually averages 11 years, but occasionally there have been cycles of 10 years (or, very rarely, even less).

In this cycle we saw it commencing its climb in the autumn of 1986. But prior to the previous cycle reaching its minimum, there had been almost two years of solar flux numbers averaging 75. This can be a long time when you have been used to hearing lots of DX on the h.f. bands.

Decline

To arrive at my assumption of the next sunspot minimum, I have extracted solar flux numbers for the years 1984, 1985, 1986 and 1987. These four years were the ones when the cycle 21 was in decline. I then extracted the solar data for 1993 until the present time.

The first half of 1984 saw the solar flux varying from 100 to 140. Then the decline started, which is very similar to what happened in the spring of this year. The last four months of 1984 had a solar flux count averaging 76. That was some drop!

1985 saw the flux averaging 75. I estimated that the previous sunspot cycle reached its bottom (or minimum) in June 1986. At that time, the flux was averaging just over 67. (Official statistics, however, claim that the minimum was two months later).

The following six months showed only a small rise in solar activity. In 1987, the new sunspot cycle started its upward climb, the average for the year being 85.

We now go forward to 1993 with the flux giving reasonably healthy numbers. It reached 142 in February but by September it had dropped to 85.

Coming to the current year 1994, January had a flux count of 115 with February just under 100. This was when the deadline in band conditions became obvious, and by March, it was averaging 91.

By April, it had dropped to 79, May became 80, June was 77, July 81, August 76 and September 78. With all this data extracted, it was time to calculate or guess(!) when the current sunspot cycle would reach its minimum. A pattern had developed between the latter half of 1984 and the beginning of 1994.

These were the years when the drop, or decline in solar flux was at its greatest. So it became reasonably simple, if that is the word, to calculate the number of months left before the last cycle reached its bottom.

As I stated earlier, I calculated the previous sunspot as taking place in June 1986. This would make another eighteen months from where are now until we reached the end of the sunspot cycle 22. Does anyone follow my logic? ■

My Forecast

So, here is my forecast - the minimum should be in March or April 1996. After April 1996, we should see a steady rise in solar flux numbers until the latter half of 1997. Then we will be off again to the very top, which could be around the turn of the millennium, ie. year 2000.

In conclusion, it seems the current sunspot cycle will travel approximately just under 10 years, which could be one of the shortest cycles we have ever had. For anyone who likes to follow the solar pattern and wishes to know for themselves when the current sunspot reaches its minimum, look for flux numbers in the 60s. August 1986 had 24 days in the 60s and September 1986 had 25 days. The lowest solar flux numbers were reached from June 24 to 30, July 2 and August 13, all with 66.

As you will have seen, most of the solar flux data has been calculated in the first place by averaging the daily numbers on a weekly basis and then on a monthly basis. Of course, there are days when the solar flux is higher than the average. But a graph taken of the years 1985 and 1986 show very few occasions when there had been any significant rises over the average.

I should add that the last complete sunspot cycle, number 21, was regarded as a typical cycle in relation to its predecessors. Had that not been so, comparisons with the present cycle 22 would have been invalid.

The Man Who Picked Up The Galaxy

Robert Newman tells the story of Karl Jansky and how he 'accidentally' discovered radio emission from space.

Infrared image of the central 150 light years of the Milky Way. Photographed in 1989 by Dr. Ian Gatley and Dr. Dick Joyce.
Courtesy National Optical Astronomy Observatories.

In 1928, a radio engineer named Karl Jansky was assigned to investigate static on radio telephone lines. In doing so, he accidentally discovered radio emission from space, and gave astronomers a tool with which to uncover a new picture of the universe.

Karl Jansky was born in Oklahoma, USA, in 1905. His father, Cyril, a professor of electrical engineering, was teaching there at the time. Later, the family moved when Cyril Janksy took a job at Wisconsin University.

Karl Jansky's early career closely paralleled that of his older brother. Karl excelled academically and took a degree in physics at Wisconsin. In 1928, after a year of postgraduate study, he applied for a job as a radio engineer with AT & T, at the Bell Telephone Labs in New York City.

The company medical, however, revealed that Karl was suffering from a kidney ailment, Bright's disease. Nevertheless, after taking into consideration Jansky's academic record and listening to persuasive words from his brother, Bell Labs decided to take him on.

Pinpointing The Source

Since the previous year, AT & T had run a short wave transatlantic radiotelephone service. Initially, it operated at a frequency of 60kHz, but the system was plagued by electrical interference. Customers complained about the constant hissing and crackling of static on the line - understandably at $75 for a three minute call!

Things were no better when the frequency was switched dramatically to 10-20MHz. So, the company set out to nail the problem once and for all.

A group of radio engineers headed by Harald Friis and C. R. Englund were given the job of pinpointing the sources of the static and minimising it. For this they needed their own directional short wave antenna, so they set to work building one at a field station in Cliffwood, New Jersey.

There, in August 1928, arrived Karl Jansky. Due to his health problems, his superiors had posted him to the rural field station instead of installing him at the main labs in polluted New York City. Thus, Jansky found himself investigating the short wave static problem only a few weeks after joining Bell Labs. He earned $35 a week.

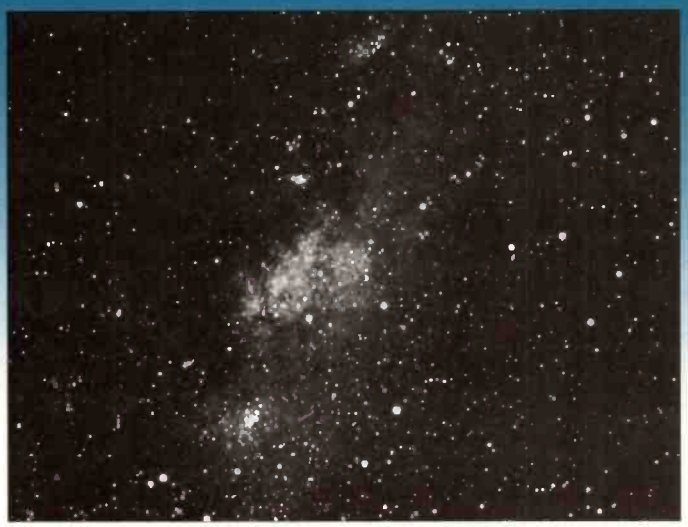
Getting To Grips

Jansky spent some time getting to grips with the technology of the job, never having taken engineering as a specialist subject. While learning the business, Jansky observed longwire static with a continuously rotating antenna, and helped adapt the idea to short wave.

The designing and building of the short wave receiver was a slow process. It was late in 1929 that the construction of the antenna began in earnest, to a design of E. Bruce, a member of the Cliffwood group. It was officially known as a Bruce array, but unofficially as the 'Merry-go-round'.

The antenna was designed to be two wavelengths long, though the exact dimensions were not finalised until Jansky had found a quiet band to listen to at a wavelength of 14.6m. It consisted of a wooden frame built of 50 x 100mm fir timber, 29m long and 13 feet high.

This frame supported nearly 121m of brass tubing, divided into two almost identical elements. Each element was crenellated into quarter wavelength sections and spaced from the other by a



Towards the centre of the Milky Way. *Courtesy National Optical Astronomy Observatories.*

quarter wavelength. The reflector, or passive element, was about 600mm taller than its counterpart.

The whole thing was mounted on four Ford Model T wheels and running around a circular track, and rotated continuously at three revolutions per hour, powered by a quarter-horse-power motor. The receiver shack was situated 90 yards away, connected to the antenna by copper pipe.

The design allowed the direction of the static source to be determined, as the array would pick-up only emission arriving roughly perpendicular to its length.

In early 1930, word came that the field station was to move a few miles south to a spacious new site at Holmdel, New Jersey. The Bruce array was dismantled, transported to the new location and reassembled in an ex-potato field. By August 1930 the antenna had been tested and debugged, and the static investigation could begin.

Mysterious Hiss

Studies began on the 14.6m wavelength, over a bandwidth of 26kHz. Initially however, only a small amount of static was picked-up. This state of affairs continued for some time, so Jansky stopped work on the problem when winter arrived and concentrated on other things, taking it for granted that '....there is practically no static in winter'.

When Jansky returned to the static in the following year, there was no shortage of the stuff, so he began to work out where it was coming from. By studying weather reports and noting in which direction the static was strongest, Jansky determined that part of the problem was caused by thunderstorms.

There were two distinct components, one the result of nearby storms, the other the result of distant ones, radio emission from which was bouncing off the underside of the ionosphere. In the background though, was a mysterious hiss.

In his August 1931 work report, Jansky described it as 'a very steady hiss-type static, the origin of which is not yet known'. A look at the records collected by the receiver revealed that the hiss seemed to be coming from a definite part of the sky, which appeared to move as the earth rotated.

In his January 1932 work report Jansky wrote that the interference '....changes direction continuously throughout the day, going completely around the compass in 24 hours'. He was intrigued, and finding the source of the hiss became his pet problem.

Jansky immediately suspected that the radio emission was coming from the sun, and referred to it as 'sun static'. Even when study of his results revealed that the source was initially at his strongest at night, Jansky still believed that the sun had something to do with it. He could think of nothing else that would case static that varied in a 24-hour cycle.

Complications arose when Jansky discovered that the peak did not recur every 24 hours exactly, but reappeared around four minutes earlier each day. The source was completing a circuit of the sky in 23 hours, 56 minutes.

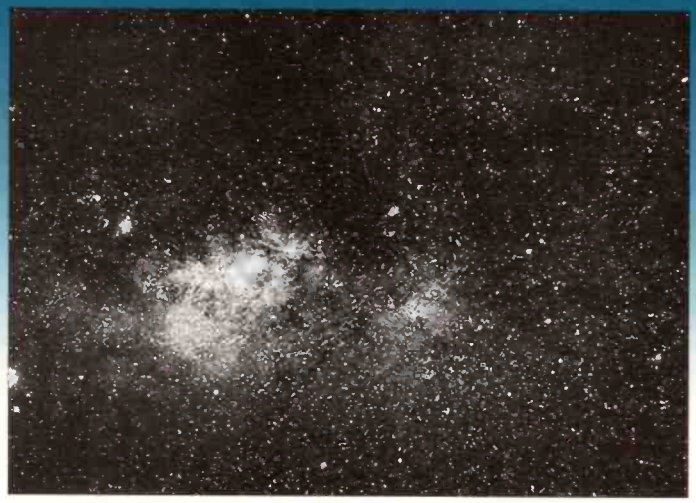
To an astronomer, this would have been a dead giveaway, as the earth takes about 23 hours, 56 minutes to rotate once with respect to the stars. A radio source lying outside the solar system would therefore reappear in the same part of the sky approximately four minutes earlier than the previous day. Jansky however, was no astronomer, and did not yet appreciate the significance of his results.

In June 1932, Jansky and his colleagues suffered a pay cut and reduction to a four day week as a result of the Depression, but the Holmdel field station and the short wave antenna survived and Jansky continued his work. By this time, perhaps due to his training in physics rather than engineering, Jansky was the only member of the group with a significant interest in the background hiss.

On 31 August, there was a convenient eclipse of the sun visible from Holmdel. Jansky was very interested to see if this interruption in the sun's radiation would affect the intensity of the static, but he observed no detectable change.

After a while, Jansky's

Optical view looking towards the Galactic Centre. *Courtesy National Optical Astronomy Observatories.*



Wide-angle view of our Galaxy looking towards the Galactic Centre.
Photograph by D. F. Malin.

supervisor, Harald Friis told him to write up his findings in a paper, which appeared in the December 1932 edition of the *Proceedings of the Institute of Radio Engineers*. In this paper, Jansky mentioned that 'hiss-type static', but noted its cause as unknown. The big breakthrough was about to be made, however.

The Discovery

At about the time his first paper was published, Jansky was asked to plot an entire year's worth of data by George C. Southworth, an AT & T employee who was studying 'diurnal changes in earth's currents'. When Jansky did so, he was struck by the fact that his mysterious radio source had shifted a total of exactly 360° with respect to the sun over a period of precisely twelve months.

He noted that, at the start of the twelve month period, the source would be coincidental with the sun, would steadily get four minutes further ahead of it every day, until at the end of the twelve months it would again be coincidental. Jansky might have suspected the truth at this point, but confirmation may well have come from A. Melvin Skellett, a friend of Jansky's who was also a radio engineer with Bell Labs and a graduate astronomy student.

Skellett may have pointed out that, bearing in mind that the earth takes one year to orbit the sun, during which time the stars remain effectively fixed, an extraterrestrial radio source outside the solar system would behave exactly as Jansky's was doing.

Jansky was euphoric. He was now absolutely convinced that he had made an earth shattering discovery. Radio emission from space was something previously unknown. He immediately began to work out where in space the mission was coming from.

Analysing his results gave Jansky a rough idea of where the source was in space, but things were complicated by the large area from which the radio waves were coming, plus the fact that the main antenna could not measure the height about the horizon of the sources. Jansky tried using other antennas at the site for this, but without success.

He did manage to work out that the emission was coming either from the constellation of Hercules - the direction in which the solar system is moving - or from Sagittarius, the direction in which the centre of the Galaxy lies.

Jansky also had the problem of explaining how the hiss could be picked-up, even when the source was below the horizon. He came up with the idea that diffraction was responsible.

Media Celebrity

Jansky wrote up his results in a paper dryly entitled *Electrical Disturbances of Extraterrestrial Origin*. Harald Friis had vetoed a more eye catching title and forced Jansky to use qualifications like 'apparently' and 'seem to'. He was wary of Jansky making claims which might turn out to be wrong.

The paper was presented at a meeting of the International Scientific Radio Union in Washington DC in April 1933. It attracted only a small, unenthusiastic audience of old radio engineering professors and Bureau of Standards engineers.

Jansky was surprised and disappointed at the lack of interest from astronomers. Things were no different when the paper was presented again in Chicago, two months later.

Karl Jansky was unlucky in this respect. His discovery came at a time when most astronomers were unable or unwilling to follow up his work.

They were just beginning to undertake extensive photographic studies with big telescopes. It was exciting and time consuming work and few astronomers had time for a fledgling field of unproven usefulness like radio.

Besides, not many of them knew much about it or how to make sense of Jansky's data. Worse still, it was the time of the Great Depression and university astronomy departments simply weren't willing to spend money employing radio engineers without being certain it was worth doing.

Strangely enough, much greater interest came from the mass media. When Bell Labs issued a press release outlining Jansky's discoveries in May 1933, a front page story appeared in the New York Times. Next day, the hiss from outer space was heard live on an NBC radio broadcast via a link to Jansky's antenna.

There were also more newspaper reports in other parts of the world. The young radio engineer had become something of a media celebrity.

Drive & Determination

It wasn't enough for him, however. Jansky tried to get through to the astronomical community by writing an article for *Popular Astronomy*, a well read magazine of the time. This did have some effect when it was seen by astronomers Fred Whipple and Jesse Greenstein, who came up with a theory which attempted to explain how radio emission came about.

Unfortunately, when they discovered their calculations to be incorrect, what little enthusiasm there was from the scientific community subsided. Despite this, Jansky's drive and determination remained high, and he continued his investigations.

During the rest of 1933, he attempted to study the nature of emission at different frequencies. The main antenna was capable only of working within 10% of its optimum 20.5MHz, and no change in signal strength over that range was found. Other antennas at the site were used to study assorted frequencies, but Jansky found that he couldn't usefully compare results from different instruments.

In his August 1933 work report, Jansky suggested that the radio emission in fact came from the whole of the Galaxy, not just part of it. By October, he had worked out the details of the theory.

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The Man Who Picked Up The Galaxy

He knew that the Galaxy was disc-shaped and that the solar system lay inside the disc, about halfway out from the bulging nucleud. Radio emission should therefore come from a distinct band around the sky (visible as the Milky Way) and be strongest from the direction in which the centre of the Galaxy lay, as there were more stars in that direction than anywhere else. (In reality, the emission came from clouds of gas surrounding the stars, but the effect was the same).

This accounted for Jansky's findings neatly. There was now no need to explain how emission could be picked-up when the source was below the horizon - there wasn't a single source at all.

It was from here on that Karl Jansky's work on extraterrestrial radio fizzled out. Due to the lack of interest from astronomers, Friis not surprisingly considered the 'star static' to be of little importance, and not worth spending company time on.

He told Jansky to stop work on it and to investigate other aspects of short wave static. Janksy reluctantly complied. He was not one to cause trouble, but he found the new work less interesting and less likely to attract publicity.

Serious Study

Things looked up in the autumn of 1934 when the Director of Research at Bell Labs used some of Jansky's findings in a lecture, and described them as 'the most interesting discovery in recent years'. This prompted Friis to ask Jansky to write another paper, which he did.

In it, Jansky described his theory on how the shape of the Galaxy was responsible for the variation in strength of the signal. But again, there was a dispiriting apathy in the astronomical community. Perhaps more astronomers would have been interested if Jansky had drawn up a contour map of the intensity of the emission, but it never seemed to occur to him.

Jansky was permitted to do some more serious study of the phenomenon in 1936, when extraterrestrial static was found to be the limiting factor of useable signal strength. He wrote another paper, but thereafter never returned to the subject. During the war, Jansky worked on a system which could track and identify German U-boats by intercepting their short wave radio transmissions.

Slow Development

There were a few other people interested in radio astronomy, however. Most notable among them was Grote Reber, a radio engineer who, in 1937, built a dish antenna of the type suggested by Jansky in his backyard. It was the first purpose-built radio telescope and for almost ten years, Reber was the only radio astronomer in the world, even he only an amateur.

Despite his remarkable spare time efforts, which included making a radio map of the sky, Reber's work remained unappreciated for some timer. But then, as in many other fields of science and technology, the Second World War changed everything.

During the war, engineers on both sides worked flat out to improve radar and radio communications. When peacetime returned, radio technology had taken a big leap forward from pre-war days.

On top of this, universities in America could now afford to hire radio experts, many of whom had nothing to do after the scaling down of military projects. Radio astronomy, after many years of neglect, finally began to take off. Karl Jansky lived just long enough to see his original work begin to bear fruit. He died of a stroke in 1950, aged 44.

Usefulness of Radio

The usefulness of radio to astronomers stems from the fact that the radio picture of the sky doesn't look much like the optical one. Some objects which are bright optically are faint in radio wavelengths, while some objects which are powerful radio sources have no detectable visual output. This allows astronomers to better understand the nature of the objects concerned.

Radio has a wide range of applications in astronomy. It can be used to study the centre of our galaxy, as radio waves easily pass through the clouds of dust which obscure our optical view of the galactic nucleus. It can also enable astronomers to roughly determine the structure of the Galaxy by picking up 1.3GHz emission from enormous clouds of hydrogen gas.

But, perhaps most important of all, radio telescopes can pick-up weak emission from all over the universe - the echo of the big bang - giving astronomers a look at how the universe evolved in its early stages.

Jansky's Contribution

Luck certainly played a part in Jansky's discovery. The antenna built for the static investigation happened to be just the kind of thing needed for the detection and study of extraterrestrial emission. It was sensitive, had fairly good directivity and by good fortune operated at around the frequency at which the galactic radiation is strongest.

In addition, the investigation itself involved a methodical gathering and study of results. This enabled Jansky to notice the phenomenon and pin down the source.

On top of that, the sun was on Jansky's side. During the early thirties it was going through the minimum of its 11 year cycle of activity and wasn't doing much on the frequency Jansky was studying. (This was why Jansky didn't detect the sun with the antenna). Had the cycle been at its maximum at the time, strong radio bursts from the sun and disruptive ionospheric effects would have made the results far more difficult to understand).

On this foundation of luck must be added Karl Jansky's great resolve to find the course of the interference. When other members of his group lost interest in the hiss, Jansky's curiosity drove him on.

This effort went largely unrewarded. Karl Jansky never received any scientific award, even when the significance of his work was becoming apparent. He did, however, have a scientific unit named after him. The amount of power received in a radio telescope from an extraterrestrial source is measured in Janskys! ■

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The Active Nomad is the ideal accessory for the scanner user who likes to travel a lot. Lightweight, compact, easy to use, it incorporates a Garex wideband pre-amplifier (25MHz - 1GHz) to maximise reception, together with a built-in filter to reduce troublesome medium and short wave signals.

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Short Wave Magazine Special Offer Price is £24.95 plus £1.00 P&P.

Overseas readers please enquire as to price and availability.

Please use the Order Form on page 83

Kieth Hammer & Garry Smith, 17 Collingham Gardens, Derby DE22 4FS, England.

DX Television

Sporadic-E reception was possible on November 5 and 6. The reception on the 5th was very unusual consisting of Canal Plus audio only on channel L2 (49.25MHz) for several minutes! An opening to Spain occurred around noon on the 6th with various stations coming through on channels E2, E3 and E4. An opening to central Europe occurred on the 27th with signals from DRS (Switzerland) on Channels E2 and E3, ORF-1 (Austria) E4, ARD/ZDF (Germany) on Channel E2 and RAI UNO (Italy) on IA and IB. The 28th produced signals from Spain on Channels E2 and E3 around noon. Other Band I activity throughout the month was confined mainly to Meteor Scatter activity on channels E2, R2 and E4.

Tropospheric reception occurred in early November with several Benelux stations being receieved. During the afternoon of November 6, strong French Canal Plus signals were evident on all channels throughout Band III.

Reports

Tim Bucknall (Cheshire) saw RTE-1 and Network-2 from the Kippure (Dublin) transmitter on November 2nd. The Channel E transmission was by far the strongest (in colour) but the Channel H signal was much weaker.

Stephen Michie (Bristol) received several German stations during November 6 including ARD-1 on Channels E6 and E32, plus the FuBK test pattern from Nederland-2 on Channel E27 with the identification 'Zender Lopik'. Many French stations were evident too, including 'M6' on Channel L5. Moving further across Europe, Stephen comments that the present opening sequence of TV Slovenia (**Fig. 1** and **Fig. 2**) is identical to the former 'TV Ljubljana' one.

Riccardo Mariotti (Italy) has no free channels available at u.h.f. because of the numerous private stations and relays operating throughout the country. Band I and III is not so much a problem and Croatian TV can be received most of the time with watchable quality in Band III on channel E11 (**Fig. 1**).

Reijo Siivonen (Finland) has been involved in DX-TV reception for over ten years using various multi-system TV sets. A Hungarian-made f.m. tuner allows the reception of the OIRT f.m. band (66-73MHz) via Sporadic-E. During settled weather periods in the summer months, Swedish TV is receivable at Reijo's location at Rauma on Finland's west coast. Unfortunately, the signals are almost non-existent between December and March.

Tom Crane (Essex) has noticed a curious phenomenon on Italian Channel IA. The three main Band I RAI UNO transmitters are Monte Nerone (53.740MHz), Monte Cammarata and Monte Caccia (both on 53.760MHz). Most of Tom's reception occurs on these frequencies and Monte Nerone is easy to identify using a scanner. Occasionally a strange noise similar to air bubbling through water has been noticed on 53.760MHz with the scanner set to a.m. reception. Tom believes that this may be two carriers of comparable strength beating together producing the low frequency bubbling sound. Have any other scanner users noticed this strange effect?

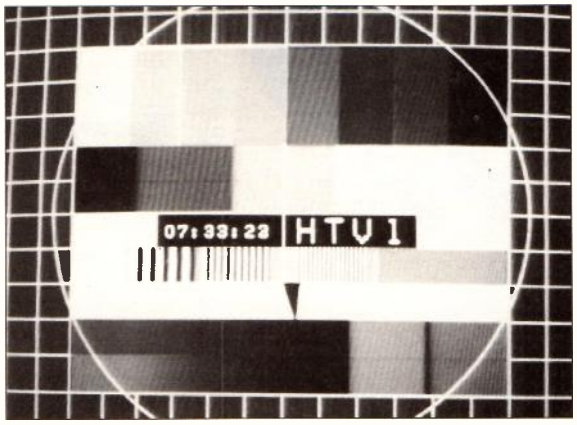
Lt. Col. Rana Roy (India) has received an unusual station on several occasions recently. It transmits a white cross-hatch pattern on Channel E8 and it is usually present when there is no other signal. There is no identification and the signal comes in from the north-west, so presumably it originates in Pakistan. Recently, the state's third network 'Doordarshan-3' was re-launched via a 1kW transmitter in Delhi. The station lacks popularity and companies are not interested in advertising.

Stretched Test Cards

Most DXers will by now have seen test patterns in the 16:9 format. The Netherlands are using a stretched version of the Philips PM5544 for some Ned-2 transmissions. Incidentally, in Belgium the 16:9 version has replaced the PM5544 on a permanent basis. BRTN-1 transmissions now take place throughout the night with text pages being shown.

Regional Testcards

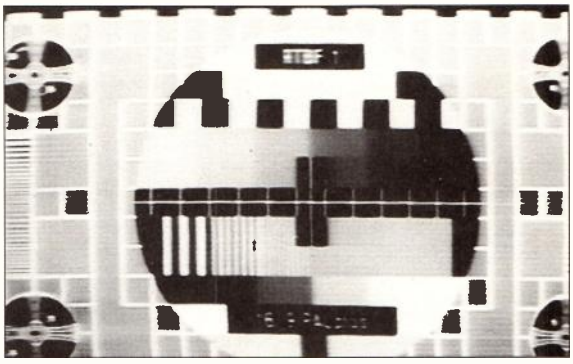
The unusual electronic test pattern with 'Nordland' identification (**Fig. 6**) was seen on Channels E2, E3 and E4. The Nordland area lies mid-way up the coast and includes the three main Band I transmitters



Croatian 1st Network FuBK test card.

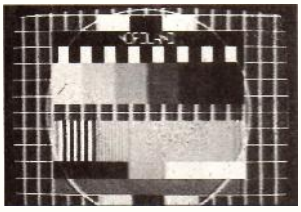
TV Slovenia opening caption received by Stephen Michie (Bristol).

Part of TV Slovenia's animated opening sequence.



A stretched PM5544 from RTBF-1 (Belgium) The identification is 'RTBF-1' at the top and '16:9 PAL plus' in the lower black rectangle.

Portuguese identification caption via Sporadic-E from Lousz (Channel E3).



Norwegian regional test card from 'Nordland'.

Steigen (E2), Hemnes (E3) and Hadsel (E4). Whether it was simply a one-off broadcast we don't know but NRK obviously have the facilities for regional test transmissions.

Winter-Time DXing

Anyone who commenced TV DXing last summer will realise that propagational conditions during the winter months can be bleak to say the least. Usually, sustained Sporadic-E openings can be relied upon until late August or the first week in September, then a noticeable lack of reception occurs. This is more noticeable to the enthusiast using basic antennas such as an indoor dipole because it excludes all but the stronger openings which may occur.

We know from experience that many new enthusiasts don't become involved in the hobby until late summer and the lack of signals can be most off-putting. What do DXers do all winter?

Sporadic-E reception is possible all year round but it occurs predominantly throughout the summer months, i.e. May through to September. Reduced activity occurs during most years in the autumn with occasional openings matching those experienced during the summer. Often there are strong openings in late December/early January where reception can last for hours. Meteor-shower activity can occur at anytime but signals last only briefly, so you have to be quick off the mark to identify the pictures. The most productive showers for TV DX during the winter are the Quadrantids (Jan 3-4th) and the Geminids (Dec 13-14th). During these showers, propagation is possible on frequencies throughout Band III.

Tropospheric reception can be as enjoyable as Sporadic-E and openings can occur at any time of the year. Signals are stable so there is the added bonus that whole programmes can be watched unlike Sporadic-E reception where you don't know whether the Russian ballet dancer will suddenly be replaced by a raging bull from Spain!

Tropospheric reception is associated with anticyclonic weather conditions and sometimes these can last for several days at a time. Reception tends to diminish during the day but evening and early morning periods can provide local-level signals for most enthusiasts. Round-the-clock transmissions in Europe mean that rare channels can be DXed throughout the night while the 'BBC' and 'Channel 4' transmitters are off the air.

During a typical opening, DXers in central England can receive French, Belgian and Dutch signals. An improved opening provides additional signals from Germany, Denmark and sometimes Sweden and Norway. 'Super' openings can include Poland, the Czech Republic, Switzerland and Austria. Tropospheric reception from stations along the north coast of Spain are possible mainly in southern England; there have even been reports of Basque transmissions on channel E35 being received as far north as Lancashire. DXers along the Scottish east coast can expect plenty of Norwegian, Swedish and Danish reception thanks to the sea path and lack of other transmitters *en route*.

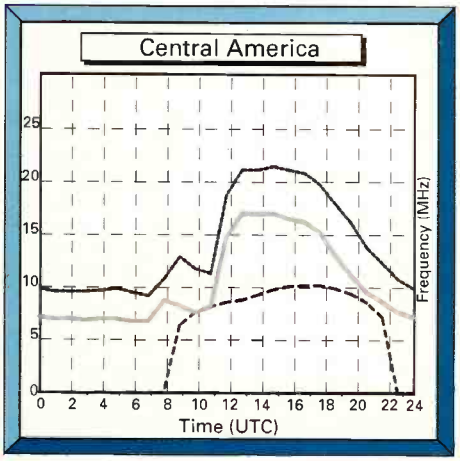
With tropospheric reception, more attention needs to be paid to antenna efficiency and although many enthusiasts do remarkably well using loft antennas for Bands III and u.h.f., an outdoor system is recommended.

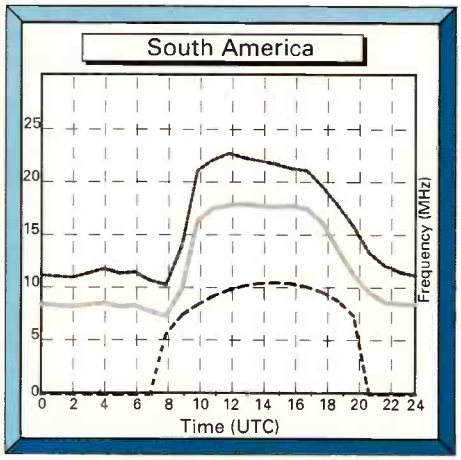
Please send DX-TV reception reports, equipment news, off-screen photographs and general information as soon as possible to the column head address.

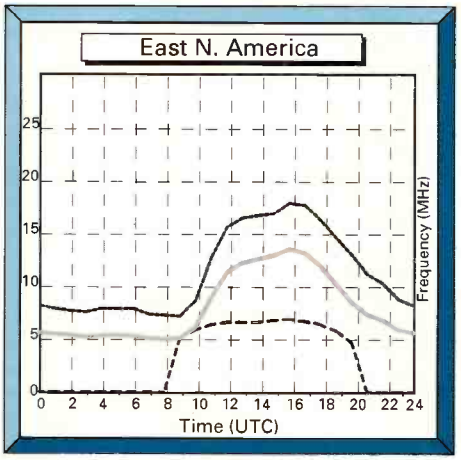
Jacques d'Avignon VE3VIA

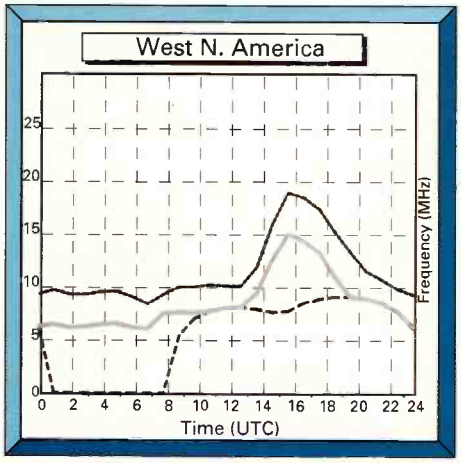
World Propagation Forecasts February

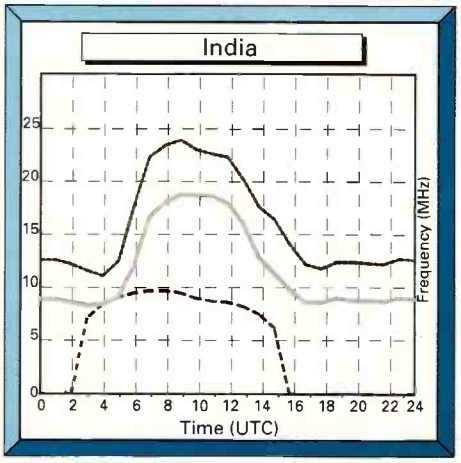
Circuits to London

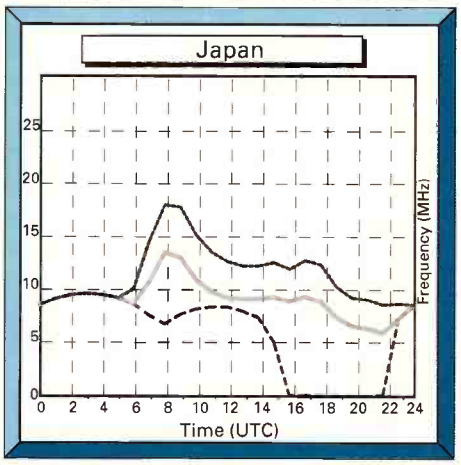


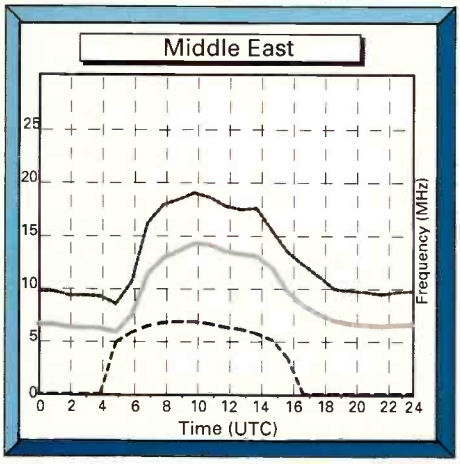


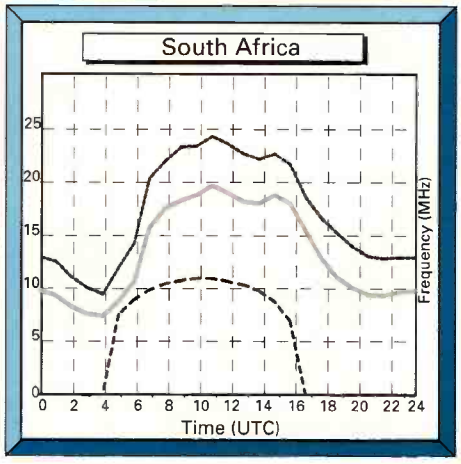


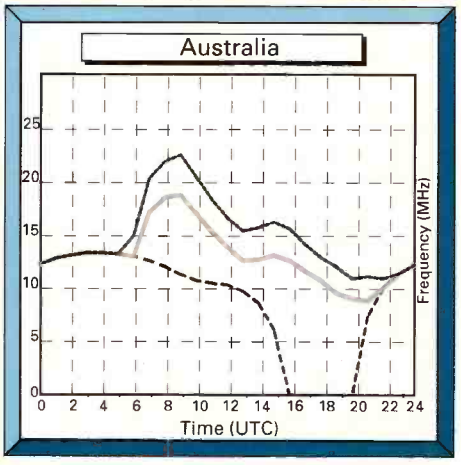












How to use the Propagation Charts.

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

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

Lastly, the upper dashed line, represents the maximum usable frequency (MUF) a 50% probability of success for the path and time.

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

Good luck and happy listening.

Propagation Extra

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

Ron has provided two barometric pressure charts for this issue, **Fig. 1** covers the month of November 1995, **Fig. 2** covers December 1995. In future each chart will cover one calendar month.

Fig. 1: Barometric pressure chart for November 1995 taken by Ron Ham at Storrington, E. Sussex.

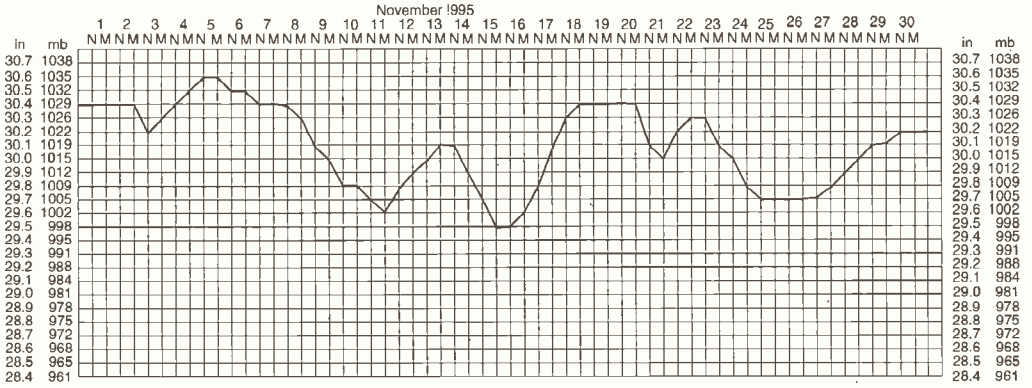
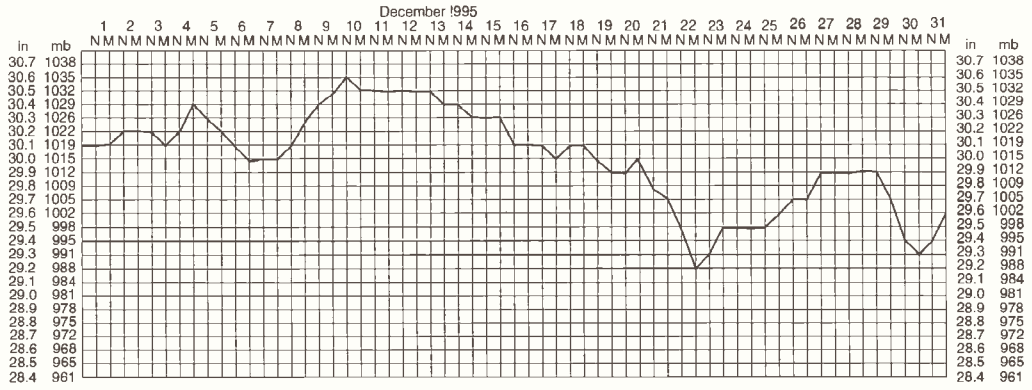


Fig. 2: Barometric pressure chart for December 1995 taken by Ron Ham at Storrington, E. Sussex.



Roger Bunney, 33 Cherville Street, Romsey, Hants SO51 8FB

Satellite TV News

The latest from the Clarke Belt

Mid December and snow falls across the UK, early by normal British Winter standards. The snow has also fallen rather more thickly in the Balkans as the United States peace keeping troops arrive en-mass in an attempt to maintain a wintery calm between the Serbs and Croats. President Clinton too, has been on hand with a mid December visit to Europe including Northern Ireland, Eire and Germany - co-inciding with the signing of a Yugoslavian peace treaty in Paris. As expected, the satellite air waves have been very busy with all manner of outgoing news packages, live 1 and 2-ways, etc. Both NBC and CBS news featured live inserts and links from the snow clad front-line (links are live announcer bridges between a programme item finishing and a new (next) item starting) using several satellites such as Orion 1 @ 37° West; Intelsat K @ 21° West and Eutelsat II F3 @ 16° East (Tusla). One such interesting satellite 2-way was between President Clinton (Paris) and the CBS news reporter in Croatia (this satellite link unknown), feeding back into the 'States on another bird for inclusion into the main programme make-up, in turn linked back into Europe via Intelsat K and a further uplink from the London Teleport onto Astra for Europe-wide distribution, a total of four satellites to bring the programme as an Astra Sky News offering, using undoubtedly an Immarsat 'phone line terminal for general comms. from the ground-Stateside in Yugoslavia!

More domestic perhaps but important within the sporting arena was the UEFA football draw, December 17th at Birmingham's International Convention Centre and carried via Telecom 1C on the 12.605GHz vertical transponder, with various interviews and foreign reports into the European networks late afternoon. England drew to battle with her old enemy Scotland in the 1966 European Championships June 15th next.

Julian Redwood (Christchurch, Doreset) comments on several good news feeds, November 20th with Shuttle Landing operations - the final Bosnian Peace meeting had 'feeds were all over the place' including an unusual sighting of the 45° West PAS-1 bird carrying Bosnian talks in NTSC (525-line) at 11.67GHz and in PAL (625-line) at 11.64GHz. Several transponders on Orion-1 also carried Bosnian activity in analogue, but more recently Julian comments on fewer Orion feeds visible, most likely having opted into the digital domain. Unless you're fortunate enough to own a digital receiver, can tune exactly to the specific frequency and also select the correct bit rate - all you'll see is a screen full of snow! The advent of digital transmission presents a serious challenge to the satellite enthusiast and only when we can gain access to reasonably priced equipment can we assess how easy - or otherwise - digital DXing will be...

Several readers have commented on a very weak 525-line NTSC signal on the 21° West Intelsat K which if you've a big enough dish, say upwards of 1m, can be be identified as Dubai at 12.725GHz vertical. **Ian Waller** (Lincoln Satellite) suggests this is from the US spot beam, the UK is perhaps enjoying a spurious side lobe from this particular antenna. Ian's C-Band activities of late have been quiet, Sky were taking a South African test match cricket feed into the UK via the 34° West Intelsat 603 and one interesting observation was a camera pan around the J'burg ground and catching sight of a BT dish about 1.5m, presumably a digital uplink antenna. The analogue cricket feed lasted but one day and 'disappeared', probably into digital! To sidetrack at this time, a friend recently spent seven weeks (Oct-Nov-Dec) in India working with the OB unit covering the India v NZ cricket series for ESPN. Uplinking was engineered by Cyprus based 'Newsforce' who previously had pioneered digital SNG. The Indian uplink used a collapsible 1.8m C-Band dish, the total digital uplink equipment package weighed one tonne which was transported around India in a Russian transport 'plane as 'hand baggage'! The satellite engineer commented that previously a 3.5m dish and much higher power would have been needed to achieve the same signal/noise performance.

Near neighbour **Bandula Gunasekera** (Colombo) has just returned from the Bombay satellite exhibition and saw many dishes, receivers, LNBs and other hardware though mainly for C-Band use. Prices of components was very low, the show must have resembled the early UK satellite shows of the mid 1980s since low cost manual receivers are very popular in India. The JcSAT satellite is now testing at 128° East though only a single test signal has been received. (An Austraian newsletter comments that JcSAT-3 has been received in New South Wales using a 3m dish, a Palcom low threshold receiver at 11.525GHz). Bandula comments on the heavy fighting between the Sri Lankan Army and Tamil Tiger Guerrillas near Colombo and in the North. An oil refinery was hit and caught fire in Colombo and fighting continues. The Sri Lankan army has its own video unit and footage is uplinked back to Sky News and the World's media. He feels the Tamil Tiger problem is escalating both there and around the World.

Further into the Orient and **Alan Smith** writes in again from Chonburi, Thailand having just returned there from the UK, only to find a completely dead C-Band receiving system, the 25K noise LNB had died through rain ingress, a 23K replacement has been fitted. He is also receiving excellent C-Band PAS-4 signals including the new Sony TV offering in Hindu. Odd to report that CNN via Palapa B3P encrypted back in the Summer but Alan reports it's now back in the clear. I read that BT have now opened a UK uplink facility at Martlesham, Norfolk to access the PAS-4 bird, a very low catch in the SE sky. BT have both a 13 and 16M dish in use with 2-way traffic into S.E. Asia and India. The installation cost over £3 million!

A pleasure to hear from an established and mature *SWM* reader - **Owen Jones** (Milton, Stoke on Trent) - who having moved to his present address found that a TVDXing aerial was out and he's been checking out the satellite scene using only a 60cm dish hand tracked from the window. To date Owen has logged nearly 70 different signals both programme and news feeds such as the Ukraine, Athens, New York, Tokyo Bangkok and oddly the 'RAC Chester'! This clearly shows even the most simple of equipment can be used for quite substantial reception catches.

It looks like good news for sat-zappers with mid-Summer reception, the new ArabSat 2A should fly into orbit at 26° East late July '96 and offer 22 C-Band and more important to us some 12 Ku-Band transponders, being followed up into the Clarke Belt 10 months later by ArabSat 2B at 30° East with a similar transponder loading. Already Bahrain TV and the Lebanese 'Future Vision' have signed up for high power Ku-Band capacity so hopefully more exotic signal potential!

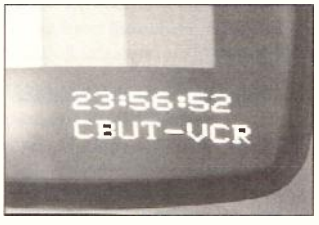
A SISLink satellite digital uplink truck used for SNG and general EFP work, this based on a VW Transporter chassis. *(courtesy Francis, SISLink).*

'AgVision' regularly features morning cattle auctions via Eutelsat capacity, often seen on II F3 16° East. Starts around 0830.

Bell Communications test card via Intelsat K @ 21° West on a Reuters lease transponder.

Rumanian TV is available nightly on Eutelsat II F3 - 11.575GHz vert.

Radio Caroline is still alive and well, heavily featured during the TESUG 'Satellite Festival' on Eutelsat 16° East.



Intelsat K offered a (UK) breakfast feed from CBUT Vancouver, BC, Canada recently with a 2-way interview, the first pan-American hop in C Band (4GHz) and the trans-Atlantic hop via 'K'.

Gerry Dexter, c/o SWM Editorial Offices, Broadstone

Bandscan

America

Caribbean Beacon, on the island of Anguilla, should be on short wave soon, if not already.

RAE, the government station of Argentina, has shifted 10kHz down from its former 15.345, for its European beam.

The Caribbean Beacon, a medium wave religious station on the island of Anguilla, is quite widely heard in North America running 200kW on its 1610kHz frequency. Now the Caribbean Beacon is adding a short wave outlet. This will give DXers and Short wave Listeners worldwide a chance to log a short wave broadcast station from Anguilla, the first such opportunity we've had in many years. Although the short wave facility is expected to be on the air soon - perhaps even by the time this reaches you, the station has not announced any schedule or frequency usage yet. Apparently there are still some matters to be settled with the Anguilla government. The first broadcasts, when they begin, will be in the form of tests.

United States religious broadcaster, the World Voice of Historic Adventism (WVHA), is operating at only half of its 500kW potential. The power reduction is part of an effort to save money. In another economy move the number of hours on the air have also been cut, down to just four. Prophecy Countdown, which operates the station, is running behind with its payments on the loan it took out to by the station from the *Christian Science Monitor*. Reports from various sources indicate that the station may have to be sold.

Ireland - By Way Of Indiana

North American s.w.l.s have long bemoaned the fact that Radio Telefis Eireann gave up short wave several decades ago, long before most active s.w.l.s even entered the hobby. This left the only short wave broadcast signals from Ireland to the occasional pirate broadcaster. Although that has not changed we are happy to see some signs of short wave interest from RTE. First there were a couple of special event broadcasts aired by RTE and carried on short wave over BBC transmitters, more or less as tests. And now RTE programming is being regularly aired short wave via religious broadcaster WHRI, Indiana. The schedule is mornings at 1000-1030 weekdays and 1100-1130 weekends on 5.065 and weekdays 1930-2000, Saturdays 2000 and Sundays at 2100 on 12160.

RTTY on VOA

Late last year the Voice of America was running test transmissions of digital data for listeners who had the equipment to pick up and decipher them. The tests were (perhaps still are) on 6.165 from 1315 to 2030, with 300 baud ASCII, 170Hz shift.

Down Mexico Way

The little Mexican short wave station, Radio Huayacocotla, which had been closed down by the authorities, ostensibly for several minor infractions of Mexico's broadcasting rules, has been allowed to return to the air. When conditions are particularly good it's being heard on 2390 around 0000. Beware of the Guatemalan station, La Voz de Atitlan, also on 2390, though recently reported just a fraction lower than the Mexican. The Guatemalan station tends to play a good deal of marimba music.

The government station Radio Mexico International is active just slightly below 5.985, as well as on 9.705. The schedule has two segments: 1300-1700 and 2000 to 0445. Some announcements are in English.

Table 1

870	Radio La Voz de la Esperanza, Voz Adventista	5.767	Estacion Soritor
		5.957	Radio Altura
		6.090	Radio San Miguel
4.154	Radio Naylamp	6.188	Radio Oriente
4.254	Radio San Andreas	6.204	Radio Cusco
4.461	Radio Norandina	6.233	Radio Superior de Naranjos
4.567	Radio Soledad		
4.606	Radio Ayaviri	6.281	Radio Huancabamba
4.750	Radio San Francisco Solano	6.420	Radio Imperial
		6.536	Radiodifusora Huancabamba
4.840	Radio Andahuaylas		
4.996	Radio Andina	6.628	La Voz de San Antonio
5.005	Radio Jaen	6.656	Ondas del Huallaga
5.015	Estacion Tarapoto	6.670	Radio Santa Monica
5.054	Radio Acobamba	6.726	Radio Satelite
5.246	Radio Cinco Mil Doscientos Sesenty y Cuatro	6.747	Radio San Ignacio
		6.755	Radio La Merced
		6.895	Radio Sensacion
5.253	Radio Ondas del Mayo	7.050	Radio La Voz de Santa Cruz
5.498	Radio Lajas		
5.620	Radio Ilucan	9.720	Radio Victoria

Peru

This nation continues to be the most 'radio-active' country in the Americas as far as shortwave broadcasting is concerned. There are dozens of short wave stations on the air from Peru. New ones come on the air almost every month, while others relocate to different towns, or disappear altogether. Here's a listing of recent Peruvian heard in North America. Reception in Europe demands some late night/early morning tuning. Most stations stay on the air until at least 0100, some as late as 0500 or even 0600. All frequencies listed in **Table 1** are slightly variable.

Argentina

A couple of Argentine broadcasters who don't use short wave directly can sometimes be heard via a point-to-point utility station, probably intended for Argentines in Antarctica and/or Argentine UN troops serving overseas. Weekends offer the best opportunity to hear these special relays. 20.276 l.s.b. sometimes carries the programming of Radio Rivadavia in Buenos Aires and occasionally that of Radio America, also. Rivadavia airs mostly sports programming while America's format is news. These broadcasts have been reported around 2000, as well as 1300, but they seem to be rather irregular.

Bolivia

Recent loggings from this country include the following (frequencies slightly variable):

4.549	Radio Tropico
4.649	Radio Santa Ana
4.682	Radio Paititi
4.702	Radio Eco San Borja
4.750	Radio La Cruz del Sur
9.625	Radio Fides

Operations Suspended

Radio Copan International, from Honduras, has suspended its operations temporarily. The station is upgrading from 1 to 3.5kW. and a new antenna system is also being installed. Perhaps these technical improvements will make the station more easily and widely heard. When it returns it will likely use a frequency in the 31 or 43 metre bands, rather than its former 15.675. In the interim programmes formerly relayed on the Honduran station will be carried by its sister station, WRMI in Miami, Florida.

Operations Resuming

The Guyana Broadcasting Corporation has been off short wave for some time but says it is planning to reactivate both of its high frequency outlets and, indeed, may have done so by now. The 49 metre band outlet, 5.950, is a very congested spot so it may require some careful listening during periods of good conditions, not to mention a reception 'window' when any co-channel stations are off the air. Better luck may be had with the 3.290 frequency in the early morning hours, UTC.

Latin American Miscellany

Colombian station Radio Mira has resumed activity on 6.015. Rarely reported Radio Esperanza, from Chile, is being noted at 0900 on 6.089. Another rare one is Radio Patagonia Chilena on 6.080, being heard around 0000.

Radio Miskut in Nicaragua, 5.770, is heard to sign off around 2345. This station has a new address: Evaristo Mercado Peres, Director, Puerto Cabezas R., A.A.N., Nicaragua.

Radio Nacional/RAE, Argentina, has dropped from 15.345 to 15.335, apparently to avoid interference. RAE has English to Europe at 1900 on this frequency.

HCJB decided to continue its upper sideband broadcasts on a 24 hour a day basis, on 21.455 (using just 1.5kW), but has dropped the other u.s.b. transmission which was on 15.540.

Surinam's only short wave station, Radio Apinte, is again being heard on 4.991 or a hair under, with light US pops to close down at 0400. This is probably a relay of their local f.m. station's programming.

Another frequency for Radio Havana Cuba's single sideband transmissions is 11.960 between 2200-2300, in English.

Another seldom-heard higher band South American is Radio Encarnacion in Paraguay, which has been noted with poor signals by some DXers around 0100 and later.

And finally, this from the medium wave scene: station WJDN in Elizabeth, New Jersey is to be the first station to make use of the new, expanded a.m. band in the United States. WJDN will operate with 10kW during the daytime and 1kW at night on 1660kHz.

That covers things for this time. We will have more in the May issue. Until then, good listening!

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

Amateur Bands Round-up

Listening to the Amateurs

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

Certainly - well, almost! - we are within a year of the end of the Sunspot Cycle, and the 28MHz band is dead.

Or is it?

During the CQ WW SSB Contest recently the solar flux was decidedly down, at 74, but against that the K figures were low at 1 or 0 for most of the contest period. A top-line UK contest station is known to have worked more than 100 countries during the contest weekend on 28MHz. Outside the contest period, I heard nothing other than the beacons. In other words, 28MHz is often useable even when it sounds 'dead'; if only a transmitting amateur were to try a CQ call he might scare up a contact with some exotic spot.

After all, if there is a path between stations A and B on 28MHz, and neither is on the band, no listener will hear a QSO. By the same token, if stations A and B are both only listening there is still no contact!

What sort of modes are about on 28MHz at the bottom of a sunspot cycle? All the v.h.f. ones, obviously, like Sporadic-E and the assorted tropospheric things, plus long-distance contacts using the F-layer, and near-European ones using scattering modes off the same layer. If DK0WCY for instance is saying that K is down to 0 or 1, have a listen on the band; if you have a transmitting ticket, a CQ is justified.

Letters

Philip Davies from Market Drayton writes for the first time in many moons with his offering for the Set Listening Period. During the CQ WW SSB contest weekend, then Philip gave himself six hours over the Sunday morning and afternoon for the SLP, while actually listening to the whole contest. Overall he heard 20 countries on 28MHz, 72 on 21MHz, 70 on 14MHz, 45 on 7MHz, 46 on 3.5MHz and 46 on Top Band. During the SLP, he was on 21, 28 and 14MHz. Some 30 QSOs were logged first starting at 0900 until 1141; 1212 saw a switch to 28MHz where some twenty contacts were logged by 1259. Back to 21MHz to log another twenty here before finally at 1349 turning to 14MHz until 1500 when the six hours were up. In terms of countries heard the SLP yielded 77. Not bad for the bottom of a sunspot cycle!

Ted Trowell sticks to c.w. these days; on 7MHz he found ZL1BVB, PY2ASF, ZL4OL, VK3MR, OY5IPA, ZB2AZ, all early in the morning, 7Z1AB around 1700 and ZB2FK at 2200. Turning to 14MHz, Ted tried around 1600Z and located EA9PY, EA8/DJ9HD, VE7NH, 7Z1AB, W7HQC, 4X1FC, CN2EME, W6CYX, and then around 1700 WJ6O, K7GE, VE7FJE, K7HK, VK6AUU and C56WW. 1000 on 18MHz yielded HS2TRI giving his QTH as Agra, 4J3P, while at 1500 TA2ZY, HK7AAG, PZ1DV, VP9MZ, N0TM, N6ZAE, 5N0/OK1MU, EA8CN, CN2EME, KE4USV and 9J2BO. On 21MHz noon-time served for VU2BK, and 1600 served up ZS6DM, PT7WX, PY2EYE, ZS4XJ, EA8IN, EL2NC, ET3BN, PP5AVM, PY2NZR, V26R, 7P8SR, PT2AZ, C56WW, YV1NX, KK7K, W0IAK, CE2LZR, K0FW, PY2PAH, PP6RL, FY/DJ0PT, EA8CN and P40E. Finally 24MHz, where EA7GS came through at noon, and EA8/DJ1OT around 1500Z. On 28MHz Ted noted that on occasions beacons were audible, but no signs of activity.

That infernal 59 report worries **Frank Lennon** from Hyde this month. I think it really started on c.w. years ago when a contest report of 599 could then be repeated as 5NN. Of late years the widespread adoption of computerised logging has meant that 59 or 599 has been put into the program, and is therefore universal.

Before we condemn this as wrong, let's think a mite; first the computerised logging systems themselves spit out duplicate contacts, and the hard copy is at least readable! Second, log-checking software exists, and computers with enough memory to accept all the floppy-disk logs sent in. The software can now check log against log, and pass all the acceptable ones. Where a dubious one is noted, it puts it up on the screen, for human consideration. Thus log-checking is no longer a matter of dredging through hundreds of good contacts to find the odd duff one, so much as a matter of concentrating on the duff ones to see why.

For the contest station itself, there is no doubt whatever that the computerised logs are always more accurate than hand-generated ones. So - we have to live with 59 and 599 reports! Another point here concerns the l.c.d. type of so-called 'S'-meter; I have one here that says my local repeater is '59+40' even if the antenna switch is turned to the other rig!

From Hyde in Cheshire, Frank Lennon writes to say he has now got a Kenwood R-5000 receiver and a Howes CTU8 a.t.u. Frank attacks another angle of the '9' question; this time just what constitutes S9. The usual thing seems to be around 50µV, though whether e.m.f or p.d. is never stated. Again, some people reckon 6dB to the S-point, some 4, some as low as 3; anyway the sensitivity will vary with age and between band and band. The meter won't move unless the signal is enough to overcome the a.g.c. delay. In practice, what it boils down to is that often one can obtain good copy from a signal that is won't move the meter.

The problem stems from sixty years ago, before S-meters were invented; signal strengths were given by description. The only use for the darned meter really is when Joe Bloggs up the road wants to check his latest mod has increased his signal strength. Top Band saw Frank log DL9SXX and G4VFU/MM one night, while on 3.5MHz he mentions VE1PZ, 5N0VV, K2RR, VK6APZ, KC4YM, W3HVQ, WD8MQY, YU8SA all evenings, plus JA7DRM and JA0JHA in the mornings. 7MHz was missed in favour of 14MHz; JA6YS, TF3HP, ZL3MWC, N7DD, VK4DNF, VK3EW, WA6BMG, WB6FDR, ZL1BD, W0KOC, N7DDC, N7ML, ZL2APW, VK2DPU, VU2DVP; 18MHz yielded J37F, W4AS, PJ8AD, N0APW and 21MHz AB5WG, ZS6YA, WP4U, 9J2CE and 9Q5TR, that left no report on 24MHz, and a lonely OSCAR carrying DL and LA on 28MHz around 1035 on October 18.

Burgess Hill in Sussex is the home of **Mr L. D. Bentley** and his Sangean 803A plus a.t.u. As the son of the house, aged 16 has just passed the NRAE, our correspondent has a small problem...if he fails the NRAE in his turn he'll be hounded out of the house by gales of laughter! On the receiver, reader Bentley found on 3.5MHz SP9FN and IK1PM, while 14MHz stumped up SM5LPO, UA6LA, a 4Z call from Israel not completely copied and SP2PIK. There were also various broadcast stations and some of the useful long-wave navigational beacons the latter giving a bit of Morse practice as well.

Taking the road to Barnsley we find **Colin Dean**; on Top Band he noted EA8AH, EA8EA, OH0MM, OY9JD, SV8CS and TK2C. For the 3.5MHz crop he logged AP2N, A92FZ, CO1/F5JYD, FM5DN, FR5DX, HB0/HB9AON, HC1XL, HI8ADT, JA1ELY, JY60MB, J69MV, KP4AH, OH0LQK, OY1G, PJ9B, TA2DS, VK2FPQ, YS1RRD, ZF8AA, ZL1HY, 3A2MD, 7X2BK. Up another band, and 7MHz provided CE8EIO, C6AFV, HP1XVH, TI4CF, UK8GK, VP5WW, ZC4DX, ZP5MAL, 4L1FL and 9Y4VU. Skipping Twenty Colin tried 21MHz, where he snagged CT9M, J55UAB, KG4SH, OD5NJ, PJ9T, SU2MT, VP5T, VE7GAS/VP9, V31DX, 6Y5DA and 8P9Z.

Working twelve-hour shifts means **Ian Whiteford** in Irvine, Ayrshire, misses quite a lot of the activity, so his monthly magazine copy is looked forward to. I might suggest to Ian that a subscription to RSGB's *DX News Sheet* would be useful too: write to **RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE** or phone **(01707) 659015** for the details. *DXNS* is put together early on Wednesdays to reach readers by Thursday morning, so it catches a lot that alas our longer lead-time misses.

Anyway, looking first at 14MHz, Ian notes 9Y4RM, NZ3N, N2TGZ, FH5GT, VE1CZ, KB2HQ, IT9DIZ in Sicily, KB2BF, KN0Z, VO1SE, A61AN, ZL2AGX, VK3LU, ZC6B, which I think Ian misread from ZC4B in making the fair copy, ZL2CX, K9JJR, TA2IG, WA3WG, AE2X, N6JV, KT7G, HV4NAC, OD5NH, N1ACVE2DC and PT7AZ. Next he looked at Eighty, where VK4BQL, VK2IET, JH1GNU, JA2ML, JA1CPX, JA5VQI, JA3IM, JA3CRO, JA1BUI, JH7PFF, JA2VPO, 3V8BB, KY1H, VO1DTM, VE1KC, VE1ZZ, 5B4AFB, W2GKG, K0TPF, FM5DP, PT7SJ, VK6ACY, JE4WKR, 9H1EU, 4U0ITU, JA6JPS and VK4BER, plus, on both bands lots of Europeans. Finally, 7MHz for VK6AO and VK2DD.

Here and There

Many of you transcribe a 'fair log' to send in to the column. Please do be careful to check the fair copy; a couple of what might have been **very** interesting calls had to be left out this month because of possible but, for me, uncheckable errors!

I hear that Marion Is, ZS8MI may well be active again in April. About the same time you can look out also for 5R8.

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

SSB Utility Listening

This month I'm going to cover a number of loose ends and small 'bits' of information that I've accumulated over the past year. As I type these words, Christmas is still a few weeks away, so I've no idea how last month's offer of 'Mystic Star' frequencies will turn out.

Portland

From the start of November 1995, the Royal Navy SAR 'rescue' helicopters at RNAS Portland in Dorset have been withdrawn, and replaced by a Bristow's Helicopters Sikorsky S-61 helicopter. The Royal Navy helo's used to use the callsigns 'Navy 172' or '173', or 'Rescue 172' or '173', and these callsigns are now a thing of the past. The replacement helicopters will probably use 'Coastguard' callsigns, similar to the ones used by the Bristow's flights at Sumburgh, Stornaway and Lee-on-Solent. As yet, nobody has sent any logs for this new service, has anyone heard them yet? On a similar subject, the RAF is just starting to take delivery of some new Sea King helicopters, which will be used to replace the last two flights of Wessex helicopters on SAR duties. Soon, the only Wessex helicopters on SAR missions will be the training unit at RAF Valley in North Wales.

Balloon

I came across a small snippet in a newspaper in early December concerning the plans of Richard Branson, of Virgin Records. He has already crossed the Atlantic and Pacific oceans by balloon, and now he plans to try and circumnavigate the globe non-stop. The article mentioned that he was planning to set-off from south-eastern England sometime in early 1996. In past balloon flight, they have maintained contact with their control centre in London via Portishead Radio. When they crossed the Atlantic, they were heard several times on 5.610MHz, and the TV programme which showed his flight across the pacific showed him using 5.610 and 11.214MHz; for the next few months I would recommend that you watch the news closely for details of the launch, and then listen carefully to Portishead.

More EAMs

John Parry writes from Cyprus, commenting on the recent notes about Emergency Action Messages (EAMs). He remembers hearing them in the early 1950's, with the signals coming from Lajes, Croughton and Sidi Slimane (Morocco, now closed). In those days, cryptic messages were very rare, and all signals were transmitted using a.m. in plain voice. John also mentions another network that he remembers from the past, and wants to know if it is still used. Does anyone remember the USAF 'Cemetary Network', or is it still operational? I have seen a listing of the frequencies in this net, but I have never had any success in hearing any signals. The network is thought to be used to pass EAMs to NATO and US forces in Europe. Finally, John mentions the RAF VOLMET broadcast from Cyprus on 4.730MHz at 15 minutes past each hour (H+15). This comes from the RAF station at Akrotiri using the callsign 'Cyprus Flightwatch'. He says that the broadcast now ends with a report of the weather conditions at various airfields involved in operations in Bosnia. The airfields are identified by their four-letter ICAO airfield codes.

Pirates

Rex O. from Cornwall writes with a long list of frequencies where he has heard Scottish fishing vessels. They seem to crop-up all over the bands between 2 and about 8MHz. They are very distinctive, as they have very heavy Scottish accents, and usually the sound of engines or generators running in the background. Some of the language used leaves a lot to be desired; one wag decided it was really the 'Scottish fisherman's swearing championships'! On one occasion Shanwick ATC responded to a fishing vessel thinking it was an aircraft.

Antennas

A few months back I mentioned a request from Bob Taylor who was looking for a way to run two receivers from a single antenna. Soon after the request appeared in print, Bob found a suitable piece of equipment from a firm in Yorkshire, but I'd like to thank all those who wrote in with suggestions and ideas. Perhaps I didn't make it quite clear in the original text, but Bob wants to run two receivers at the same time. I had quite a few letters showing designs for simple switch-boxes - but this means that you can only listen of one receiver at a time. From Bob's letter, it sounds like he found what he was looking for, maybe he can be persuaded to write in and give us a brief review of his new piece of equipment.

Bodo

A few months back I mentioned a request from 'down under' for any loggings of Bodo Aeradio. **Steve Rooney** writes in with a logging of Bodo during November (see the 'Traffic Log' below for more details). Bodo tends to be used by aircraft which are taking the polar routes from Europe to the Pacific, and according to my 'boys own' atlas, it is at 67°16'N 14°22'E - not a place I'd like to be at this time of year. Steve's logging just goes to show that even rare stations can still be heard with a little patience and luck. For the record, Bodo Aeradio operates on the following frequencies as part of the North Atlantic Track (NAT-D) system: 2.971, 4.675, 8.891 & 11.279MHz. They also have a few air/ground frequencies: 2.983, 4.666, 6.544 & 8.840MHz. Steve wishes Evan good luck in logging Bodo.

Traffic Log (all frequencies in MHz, u.s.b., all times in UTC)

5.622	(13/11, 22.30) 'BFC' working Sofia, in Bulgarian. This is Bulgarian Airlines LDOC, and 'BFC' should be airliner 'LZ-BFC'.
6.683	(29/10, 23.17) SAM 200 (a USAF C-20B a/c) working Andrews VIP ('Andy'). 'Andy' asked SAM 200 to QSY to F795 upper (an unknown freq., but can't be too far from 6MHz), but within two minutes they were both back on this frequency, unable to get good contact on F877. 'Andy' said to QSY to F877 upper, and they both made good contact on 4.721MHz.
6.754	(14/11, 22.44) J4P (probably 'Magic Ops' in Germany) working ' Magic 59'. '59 reported that they were 'on-station at nuco GGVG un-nuco, Bingo nuco VVKX un-nuco'. 'Bingo' is the term they use to indicate their minimum safe fuel load. '59 said that they would call again at 00.15 for weather at LGAD and LGSA.
6.760	(29/10, 22.05) Buchan ADRU working Y0B, who was some sort of RAF tanker aircraft (VC-10 or Tristar). They spoke about diverting Y0B's 'chicks' (interceptor a/c); Buchan wanted to know which airfield the 'chicks' would prefer, and Y0B said his chicks had enough fuel for another 30 minutes of exercise. This freq is 'AN' for the RAF.
8.891	(25/11, 12.19) Aeroflot 324 working Bodo Aeradio, passing their position as 77°59'N 012°19'E at FL 330, BJO at 13.00z, and next is 71°26'N 030° E. Iceland Aeradio repeated the report afterwards. 'BJO' is the NDB beacon at Bjornoya, which is better known as Bear Island.
11.059	(6/11, 08.04) Air Force 1 working Andrews VIP on their secondary frequency. Their primary frequency was F400 (6.728MHz), but they were suffering bad QRM. A few minutes later, they were joined by SAM 26000. This was President Clinton travelling to the funeral of President Rabin in Tel Aviv. In just over 24 hours, almost every SAM aircraft was heard on the 'Mystic Star' network - amazing!
11.175	(9/11, 07.57) Yokota GHFS with a 'Skyking' broadcast: 'For FAIRLY, OX2, time 57, authenticate AI' which was repeated twice.
11.181	(4/11, 13.20) PACAF 01 (a USAF C-135 VIP a/c) working MacDill GHFS, having just departed from Andrews AFB is Washington DC. They also tried calling Offutt GHFS and McClellan GHFS. At 13.39 they got a phone-patch to Hickam AFB Command Post (Hawaii), and reported their e.t.a. as 16.50 local.
13.242	(29/10, 21.12) Shark 89 working Albrook GHFS with a phone-patch to a ground station who '89 referred to as 'C O 1'. Their e.t.a. was 01.30z, and the ground station, who used the name 'Moonlit' asked '89 to call them on u.h.f. 226.4MHz.
16.363	(4/12, 10.00) Portishead Radio (GKT62) working yacht *Georgiano* on marine channel 1602, with a phone-patch to a wine-merchant on Gran Canaria, asking for some wine to be delivered.

Mug Shots

Having been involved in this column for a few years now, I was quite surprised to receive a request from a reader for a photograph of me to appear one month. I filed this away, thinking that the other columnists don't put their own photo's into their columns, so why should I be different. At the Martin Lynch open-day in West London during November, several photographs were taken of the *SWM* stand, including a few including yours truly. I was very surprised to see one of the photo's used in the January 1996 issue of *SWM*. Take a look at the bottom right corner of page 9; 'yours truly' is seen talking with **Paul Wey** of the *UK Scanning Report*; the person half-hidden on the very left is one of my regular readers, 'Tex'. The stand was supposed to be looked after by Kathy from the *SWM* office, but she was chatting-up Martin Lynch's salesmen at the time.

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

Airband


Sopwith S.E.5A? No! Currie Wot. Christine Mlynek

Homebuilt Tailwind Christine Mlynek

Piper PA-16 Christine Mlynek

It's interesting to follow the technical development of new aircraft types, but sometimes they end up being mentioned in accident or incident reports. In November (page 69) a flap problem on the B.747-400 was described. This prompted **Alan Burnett-Provan** (Wootton Wawen, surely where the South Stratford Canal runs in an aqueduct?) to ask about certification. In general, requirements for a C of A in the public transport category are exacting and rigorous. There really isn't the prospect of consistently dangerous aircraft being allowed to fly.

Some problems only appear after experience (and operating hours) have been gained with the aircraft. Occasionally, fatigue shows up many years later. That's why such stringent and regular checks are made throughout an aircraft's service life. When a problem does occur, the regulatory authority has to decide on the safety implications and experience counts when making a sensible decision. How dangerous is the problem and how likely is it to occur on other aircraft in the fleet? Depending on the circumstances, a decision is made to modify the affected part in so many flying hours or after a particular lapse of time; at the next scheduled maintenance; or immediately. Standard operating procedures might be varied in the meantime.

So I don't think they'd allow the aircraft to continue flying if it presented a real danger. Incidents usually appear in the *Air Accidents Investigation Branch (AAIB) Bulletin* but no information on this case has been published to date - I've just received the 12/95 issue. The AAIB are separate from the CAA so as to ensure that accident investigation is not biassed by the economic constraints that the CAA work under.

Information Source

First, send off for the *Airband Factsheet* (see below, under Frequency and Operational News). Then, if you're a beginner like **E. Payne** (Bishops Stortford, conveniently near Stansted?) have a look at what the *SWM* Book Store can offer (see back pages of this Magazine). May I suggest *Air Band Radio Handbook* and *Airwaves '95* for starters?

On choosing a receiver, there can be nothing better than the one that seems to suit you best - so try some and see! One point, though, is that it's convenient to be able to select a frequency instantly by typing it on the keypad. Not all the Realistic PRO series scanners that I've seen can do this - some require the frequency to be entered into memory first. Do check before buying.

You Write

E.D. Hoye (Macclesfield) has broken the ice by writing to a magazine for the first time ever. I'm honoured that my column was the one chosen to write to! Despite claiming to be in an uninteresting area, things can't be that bad up north as EDH reports F15Es from Lakenheath and U2 'spy 'planes' flying over. I'm not sure where the U2s are based now as Alconbury has closed.

Try as I might, I can't please everyone and **Mark Zee** (Waterford) has decided that 'Airband' doesn't cover what he wants. Sorry. Anyway, this would be a good opportunity to remind ourselves of what I'm trying to achieve. This column enables you, the reader, to ask questions that help to improve your understanding and enjoyment of all aspects of aviation. To understand airband radio procedures, you need to know what the pilot's up to at the time. Otherwise, it all just sounds like a string of meaningless technical jargon and numbers. The radio aspect, as Mark calls it, is simple: the aircraft is on a given frequency, if anyone were to tune in then there it would be. I can't write an interesting monthly column based on that one simple fact - it's the background information, that brings the subject to life, that you readers want to see.

Navigation aids, a.d.f. and s.s.r. are all radio aspects. Most of the other contents is covered by reader request: for example, Red Arrows show dates appear by popular demand. I covered the above discussion on flap problems because readers wrote in about it. Much of my material is aimed at the 'armchair pilot,' which I'm sure we all are to some extent. Why should I mention slot times? Mark asks how many listeners have waited for a slot. Well, hands up - how many of you have flown as passengers on commercial routes? There's your answer!

There now seems to be some overlap between this column and 'Scanning' and 'SSB Utility'.'Generally, v.h.f. and navigation comes here, 'Scanning' overlaps the u.h.f. military side and 'SSB Utility' often mentions h.f. It seems to work.

In answer to Mark's questions about the North Atlantic, I did, in fact, cover this area and explained that there is no immediate plan to replace h.f. by satellite. I could have mentioned the reduced vertical separation trials (1000ft instead of 2000ft between flights above FL290), which Mark asks about, but I can't win because he also says he's not interested in operational matters! As far as reviews go, this Magazine often carries full articles on receivers. I can't review the Internet, not having sufficient funds to buy the equipment needed.

For the future, I intend to carry on answering your questions and printing your news snippets as you send them. Most readers seem happy with that, so why change?

Follow-Ups and Foul-Ups

More caption trouble! Page 68, December: note spellings of Partenavia and Yakovlev. Page 3, October: that impressive silhouette of a Lockheed Hercules was by Christine Mlynek. Must send the Art Editor on an aircraft recognition course!

Mac Line 01 (November page 68) isn't a Twin Squirrel after all. To prove it, **Robin Kemp** (Enfield) sent an article that appeared in *Flight International* (September 20-26, 1995, page 53). The London Fire Brigade's machine, G-LFBA, is in fact a Eurocopter BK.117C1, a higher-powered variant of the B1 helicopter. It's a twin, of course (both engines being coupled to the single rotor via a combiner gearbox). This type of machine is so new that McAlpine have needed to help with obtaining a C of A. As well as carrying fire brigade personnel and an underslung water-bucket, the rear hold can take pre-packed pallets of specialised equipment suited to the expected task. The helicopter enables a faster response by beating the London traffic jams.

Back to December, and **Chris Brenton** (Plymouth) adds to the list of v.h.f. London Mil frequencies (all MHz). North is 128.7 according to Aerad and **Retro** (Surrey). South has 135.275 according to Retro and Aerad, specified as east of airway B4 by *RAF Supplement*; also, 135.15 according to Chris, specified as west of airway A1 by RAF; finally, 133.3 reported by Chris.

The delivery of North Atlantic oceanic clearances is available via ACARS, the v.h.f. air/ground digital data system. Being digital it's more

accurate than humans having to copy and read-back the co-ordinates, says Chris. But, being v.h.f., it doesn't work over the Atlantic. Flights still need to report their full lat/long co-ordinates on h.f.

Frequency and Operational News

Two new reporting points have been established. Unless you know where they are, you won't know the location of aircraft when pilots report their positions. So, on B4 there's NELSA at N5351.80 W00210.85; on G1 they've created WOTAN at N5137.47 W00220.03. Plotting these points on your existing radio-navigation chart is easy as you just follow the airway until it intersects one of the latitude or longitude lines. *AIC* 100/1995 (from the CAA) describes the new points, Aerad chart *EUR/1* depicts both airways.

How do you contact Aerad to buy the chart? First send a stamped/addressed envelope to the Editorial Office at Broadstone (not to me!) and ask for the *Airband Factsheet* (now on Issue 3). This single A4 sheet tells you the addresses of suppliers who sell to the public by mail order. Then, ring Aerad for the latest price and send off cash with order. The information's easy to find if you know where to look.

Not many changes in *GASIL* 6 of 1995 from the CAA. The d.m.e. at Fairoaks has been installed and will have the ident FRK but is on test (ident TST) at present; response is on 1.122GHz. Jersey's 27 i.l.s. now boasts a d.m.e. with ident IDD and response on 1.001GHz. All i.l.s. idents begin with I.

Two LATCC frequencies were changed about a year ago and have confused **Joseph Lucas** (Crewe). 128.05 became 135.575 and 131.05 became 136.2MHz; problem solved. Have the London Mil frequencies changed, as described in December? **A. Harrison** (Chester-le-Street) says that 231.625 and 264.825MHz operate in parallel for the Pole Hill/Irish Sea sector, so don't give up on the old frequencies. From his location, A.H. has a good view of several airways (such as UA1, UA2 and UB4) on which he finds high-flying military aircraft. Then there are AWACSs doing touch-and-goes at Newcastle.

In the London Control Zone, the Special VFR facility (119.9 or, out of hours, Heathrow Approach 119.725MHz) allows VFR flights in to the Class A regulated airspace. Times for 119.9 are usually 0630-2230 weekdays or 0900-2230 Sundays/public holidays (all u.t.c.). In December, **Edward Dicken** asked where the controller actually sits. I last saw the control position near the top of the Heathrow tower, but it's now on the ground floor. Approach is actually at LATCC - all part of the Central Control Function plan. Thanks for filling in the details to **Michael Hockley** (Abingdon). In answer to Retro, also in December, all helicopters in the Zone work the same Special VFR frequencies.

While on the subject, Michael updates us with Heathrow's current frequencies. Initial North-East: 119.725 (as above), Initial South: 134.975, Initial North-West & standby frequency: 135.125, Final Approach 127.525MHz.

Chris Brenton offers two new Plymouth Radar frequencies: 369.925 and 379.85MHz.

Christmas Quiz

Unfortunately last month's quiz photo was cropped in such away that it was almost impossible to identify. To give you all a fighting chance I have included the whole photo this month. If having seen it, you think that you can improve on your entry, please re-submit. The better of your two attempts will be the one that counts. I've extended the deadline until March 15.

Could You Help?

To complete a project, **Jim Beacon G1JBG** (11 Durrants Path, Chesham, Buckinghamshire, HP5 2LH) wants to obtain the radio-magnetic indicator and the antennas for a Marconi ADF370. Contact Jim direct if you can help.

Thanks for all your Christmas greetings. The editorial time machine means that I'm writing this before the festive season and you're reading it just before February!

The next three deadlines (for topical information) are February 16, March 15 and April 12. Replies always appear in this column and it is regretted that no direct correspondence is possible. Genuinely urgent information/enquiries: 0181-958 5113 (before 21:30 local please).

Abbreviations

AIC	Aeronautical Information Circular
a.d.f.	automatic direction finder
B.	Boeing
C of A	Certificate of Airworthiness
CAA	Civil Aviation Authority
d.m.e.	distance measuring equipment
FL	flight level
ft	feet
GASIL	General Aviation Safety Information Leaflet
GHz	gigahertz
h.f.	high frequency
i.l.s.	instrument landing system
LATCC	London Area & Terminal Control Centre
MHz	megahertz
s.s.b.	single sideband
s.s.r.	secondary surveillance radar
u.h.f.	ultra high frequency
u.t.c.	universal co-ordinated time
VFR	Visual Flight Rules
v.h.f.	very high frequency

John Griffiths, c/o 22 Ffordd Beibio, Holyhead, Gwynedd, North Wales

Scanning

Pretty full mail bag this month - lots to talk about, as usual!

First, something that was brought to my attention by **'Yorkshireman'** and concerned with a BBC Radio 4 programme called *You and Yours* broadcast sometime in November of 1995. I apologise for the delay but this is the first opportunity I've had to place the piece. Apparently, interception of a doctor's conversation was made via a local GP service - where a doctor was paged to use his radio for patient details. The follow-up is that a woman patient was then bothered by malicious telephone calls. The programme then hosted an interview with Greater Manchester Police and a member of The Federation of Communication Services - a Mr. David Savage - who declared that the DTI **should now make sale or possession of scanners illegal.** Manchester Police suggested a scanner had been used to intercept the radio link.

Mr. Savage's interview brought certain aspects of this out of concern to each of us. He stated that scanners were used by nosy parkers and air band enthusiasts and that these same people could **intercept and interrupt transmissions**. Noting this, I would state clearly here that there is **NO scanner on the market able to interrupt a transmission.** However, Mr. Savage clearly states that whilst movements in telecommunications are currently shifting towards digitised transmission - and therefore more secure nets - it will take time to come to the fore. He goes on to say scanners are widely available and that his organisation thinks it should now be a **criminal offence** to own and use one. They are, he said, actively lobbying the DTI to this end.

This disturbs me. A recent letter by a **Mr. GA** some time ago clearly illustrated that a lunatic fringe exists within scanning. I condemned them then and I still do - and would also like to go on record as saying that the vast majority of users are sensible people who see this as a hobby and would not dream of drawing attention to it.

What's more, feel that the BBC could have at least got the definition of scanner users right rather than allowing what is a one-sided argument to go out on air. Mr. Savage sounded hesitant, and I felt he did not really know the area he was talking about. His qualification is that he belongs to the organisation named previously and of which little is known . I most certainly haven't heard about them before this. This bothers me. They have quite a powerful position - and we do not. Is this fair? I don't think so. To balance the debate out would the BBC research team ask, next time, for the opposing side of the argument? Let's face it; listening for many of us - for the vast majority at least - is a hobby that is personal. Mr. Savage is, I believe, scare mongering and is not qualified to do that. Yes, scanners can be used for criminal activities but so can cars. Does this then mean that car owners must be considered potential ram raiders?

'Yorkshireman' also goes on to state that many daily papers also carry scare mongering stories concerning scanners. He quotes a story that suggests owners of scanners can clone mobile 'phone numbers, using them to defraud service users. Again, not, our type of scanner! It would seem the press love the sensationalism involved here but forget that a scanner can be the name for many things - not just a radio! It looks, to me, that we are in for a rough ride ahead and it is here I urge all of you to do something when the time comes. What? We'll see - but do adopt the motto of the Boy Scouts and 'Be Prepared'.

Rumours abound from various sources that the **Black Cat Aviation Group** is suffering some sort of crisis and has, apparently, gone bust. Having read the last issue of the club magazine I note, sadly, that hardly anyone is writing in. It could therefore be the reason for the crash. I also think that BCAG should have written to everyone involved and mentioned their position. I'm sure we'll find out in due course. It is very sad when something that should be of interest to us all loses support.

Frank from Kingston upon Hull asks for the address of *The Scanning Report* edited and produced by **Paul Wey** and **Carl Ashby**. Once again, I cannot fault this piece of work and would suggest that writing to the address below will help: **Paul Wey, Editor 'UKSR', 2 Icknield Way, Baldock, Hertfordshire SG7 5AJ.**

Eddie from Scotland writes with some gen heard during a recent exercise up north. This around Lossiemouth, Buchan and Rosehearty Range. Eddie tells me most aircraft traffic is associated with the offshore oil industry but that there is plenty of milair activity likewise. He quotes listening to an exercise over the Shetland Basin and catching all sorts of 'Pilot speak'! I envy you being that close to the area, Eddie, and in fighter country. Here it's mostly transport!

October ' 95's issue asked for confirmation of frequencies and I'm grateful to **Mike Beaumont** for correlating and identifying the following:

Base	Mobile	User
441.1500	426.2500	Air Call Birmingham Airport
453.1250	459.6250	Orchards Security Coventry
455.5375	460.5375	Gnd Ops/Fire Ch. Coventry
455.7375	461.0375	Gnd Ops/Fire Ch. Coventry
455.8000	455.8000	Baggage/ Freight Handlers
456.5250	462.0250	Birmingham Airport

Mike also sent me a list with other frequencies on but these are freely available and therefore of limited use. However, should they answer any query then I will file them for use. Thanks Mike.

Bargain Antenna

Tracey Gardner G5VU has information requested by **Dave Howarth** on building a log periodic. He suggests that you try *ARRL Antenna Handbook* and also *HF Antennas for all Locations* by Les Moxon. These are available from the *SWM* Book Store. He also goes on to suggest that Sandpiper Communications (01685) 870425 may well be able to help. Tracey goes on to say that an antenna covering 100-1000MHz is available for around £50!

Tracey also says he is using his at the moment on the local packet BBS - so proof is in the pudding that it works. Tracey also suggests that you try Anchor Surplus of Nottingham. They carry an enormous range of ex-military radio gear and, having parted with £50 for an EMCO horn antenna, Tracey has subsequently found out that it was manufactured for the measurement of e.m.c., and had a gain of 6dB at 200MHz, rising to 10dB at 2GHz, and will handle a p.e.p. of 800W!

In conversation with EMCO, Tracey discovered the antenna has a price list of $4995.00 - and discloses that EMCO were extremely surprised to hear he'd bought one for just $75! Proving - once again - that there are bargains to be had out there!

P of Yorkshire writes with something to interest Fire Brigade listeners. He suggests that frequencies published by many with regard to mid v.h.f. band are link frequencies. That is, only those directly under the link will hear anything as it is a point to point system. Far better, it is suggested, to listen to frequencies within the 70MHz allocation, which is a base relay. **P** also identifies the frequency of 251.625 as coming from the Trimmingham and Rothwell from London Mil East. Also, that LJAO changes may well take a little while to come through so you are reminded - if milair is your thing - to listen to both new and old frequencies for the time being. **P** also throws light on some frequencies in the December issue, namely:

313.000 London Mil Discrete.
122.750 Danger Area Activity Information Service (DAAIS) - at Crowden, Donna Nook. Pembrey, Rosehearty, Tain and Wainfleet ranges and also on Salisbury Plain.
275.400 Middle Wallop Radar.
233.800 Lon Mil Clacton Sector new allocation. Replacement for 264.475 but this still in use.
370.075 Luechars Radar.
262.975 Lon Mil.
357.475 Brize Norton Op's. Exercise 'Brilliant Foil' involving French AF tankers under callsign 'Total' that were tactical a/c calls.

The USAF in Europe, by the way, use whatever frequency they can get

on! This from **P** as well who says that Lon Mil have been heard asking USAF pilots to clear and leave the frequency for legitimate users!

Fire Brigade news after December's column request for assistance.

70.585 should read 70.5875 - Hampshire Ch. 2. Greater Manchester Ch. 3.

70.610 should read 70.6125 - Surrey and Dyfed.

70.635 should read 70.6375 - East Sussex and South Yorkshire.

70.760 should read 70.7625 - East London, Also West York's in f.m.

70.835 should read 70.8375 - Kent and Cumbria.

70.895 should read 70.9000 - Hertfordshire, also Lancs Ch. 2 in f.m.

71.000 should read 71.1000 - Oxfordshire (NOT Thames Valley) and Humberside Ch. 1.

71.135 should read 71.1375 - Bucks and North Yorks Eastern Area.

The scribe is probably using 5kHz steps to search. Almost all Home Office frequencies are in 12.5kHz steps, particularly down the lower end of the v.h.f. band, u.h.f. tends to use 25kHz spacing. However, the new Police and Brigade allocations at the u.h.f. end are changing to the p.m.r. step standard of 12.5kHz.

My thanks to **P** for the input - and for the interesting letters. Keep 'em coming.

Meanwhile, back here at the shack, things are going well. The addition of my new antenna has allowed me to free up both sets so that each has a dedicated antenna. The VT-225 is on the newly purchased air band vertical, while the AOR AR2000 occupies the Scanmaster Base. I've since come to the conclusion the AoR is slightly deaf on air band but, then again, the '225 is dedicated and performs well above what I would have expected. Work on h.f. is still going on, with REACH and other organisations still being pulled in really well since the filter has been added to the Sangean ATS-803A. This is a brilliant little h.f. set in case you're in the market for one, and with the Howes filter and a Global a.t.u. attached - running to a long wire hoisted near vertical up a convenient tree behind the garage - it's a star! Typical h.f. work involves listening to places like Offutt. Andrews and - of course - Croughton as they chip in with the aircraft. All very interesting, all very rewarding!

That brings me neatly to the end of the piece for this month. Please remember to use the new address at the column masthead for mail. If you write to the old one, no worries. It'll be forwarded on.

My thanks again to all of the contributors - regular and otherwise. In the meantime, 73s and catch you down the log sometime soon.

VT-225.

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- GOTO function
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- All-view 12
- Backlighting

Garmin 40/45

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- Reverse routes
- NMEA output
- External aerial
- Easy menus
- Multitrak 6
- Zoom maps
- 20 hrs battery
- Weatherproof
- MOB function

Magellan 3000

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- 200 waypoints
- Rolling road
- Simulator mode
- COG, XTE
- NMEA output

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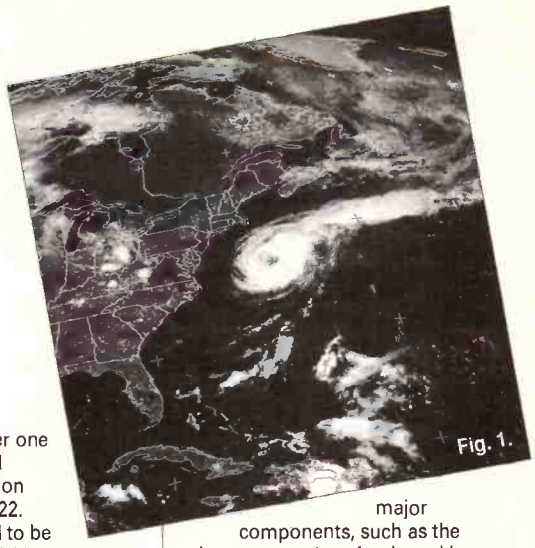
Fig. 1.

On a damp, mid-December morning, while watching NOAA-12 deliver a miserable image scenario of cold easterlies onto my computer, I received a call from **Gordon Griffin** from New South Wales in Australia, telling me that his air conditioning unit was helping him to keep pleasantly cool in the heat-wave! Gordon told me that there are many interested followers of WXSAT operations in Australia, and looking at recent bulletins from NASA, I know that the country has an active commitment to space activities. Even amateur groups are active in the field of rocket launches, as readers may recall reading in this column some months ago. Gordon's associates are developing software and he has promised to send me a copy for checking out.

Current WXSATs

The CIS WXSAT METEOR 3-5 has continued normal operations, transmitting visible-light only, on 137.85MHz. During December it made south-bound passes over Britain during the day, so we heard the sudden start of transmissions triggered by sunlight. Those readers who may have only recently started monitoring the WXSATs can hear this happen quite dramatically by watching the satellite's footprint on a computer, using a suitable satellite predictions program. Within seconds of the METEORs entering sunlight, the a.p.t. comes on and the scanner springs to life.

The two NOAA WXSATs (12 and 14) show just how low the level of daylight illumination is during northern winter. Even without a WXSAT receiver, using a conventional radio scanner tuned to 137.62MHz for NOAA-14 around mid-day, one can hear the satellite transmitting the a.p.t. (picture) as it travels northbound over Britain. As it approaches more northerly latitudes (near Scotland) its sound changes dramatically when the under-illuminated visible-light sensor information is replaced by an infra-red image. The content of the latter gives a higher frequency component to the a.p.t. sub-carrier and this is easily heard, even by an untrained ear! Those who have never tuned to the WXSATs might care to try this any day of the week.


Fig. 2.

METEOSAT - 1691 and 1694.5MHz

There are now two METEOSAT spacecraft in operation : METEOSAT-5 (the currently operational WXSAT) and METEOSAT-6 (the backup or standby satellite). From time to time the latter is operated to test additional software necessary to correct for an on-board image anomaly. These test transmissions are those that can cause some interference to transmissions from METEOSAT-5 to those WEFAX users using small dishes.

Two previous satellites in the series, METEOSATs-3 and 4 were removed from geostationary orbit in November, having come to the end of their operational lives. Removal is done using thrusters to raise the height to what is called a 'graveyard' orbit, where old, former geostationary satellites can be 'parked' so that they do not physically obstruct active satellites.

Other Geostationary Changes

The American GOES (Geostationary Operational Environmental Satellite) WXSATs are also involved in the changing WXSAT scene. The GOES-9 spacecraft has been drifting toward its next operational position at 135°W (GOES-W), moving a little under one degree per day, and scheduled to arrive on station on January 22. GOES-7 is expected to be switched off around 11 January, as GOES-9 approaches. Routine GOES-9 WEFAX operations are not expected to begin until mid-January. Here in Britain we cannot receive direct images from GOES-9. My thanks to **Jamison Hawkins**, GOES Product Manager at NOAA/NESDIS, for this information.

EUMETSAT

A new era started in early December when EUMETSAT took responsibility for the operation of the METEOSATs from ESA's European Operations Control Centre. Hand-over was marked by a ceremony held in the new headquarters of EUMETSAT in Darmstadt, when the Director General of ESA, the chairman of EUMETSAT Council, its Director and ESA's Director of Operations, introduced one of the most advanced meteorological satellite ground systems in the world. This new system enables EUMETSAT to concentrate on meteorological satellite operations, while ESOC continues the operation of ESA's scientific and development programme satellites.

The EUMETSAT Council decided in 1990 that a new ground segment should be developed for METEOSAT. The new team was given intensive in-house training on the system throughout the summer in readiness for the hand-over. Some of the staff and contractors were previously employed operating the METEOSAT ground segment at ESOC where many techniques of meteorological satellite control and data processing were pioneered.

ESOC is the satellite control centre of ESA, and has controlled over 30 ESA satellites and operated 14 satellites for national agencies. Thanks to advanced modern technology, it can control over 15 satellites simultaneously. The EUMETSAT ground segment is based on a central facility in Darmstadt with other major components, such as the primary ground station based in Fucino, Italy, and its back-up in Weilheim in Southern Germany. My thanks to **Gordon Bridge**, the METEOSAT Programme Manager, for this information.

Readers' Letters and Pictures

Correspondent, **Des Thompson G8SBU** of Exmouth, told me about his role at RAE (Farnborough) in the Space Department, where he supervised the inspection of 'break-up units' and explosive bolts for the Black Knight (a British rocket developed during the 1960s, then abandoned) and other projects. All re-entry heads were recovered at Woomera (Australia) for return to RAE for tests and evaluation. Des told me that Woomera was unique, having a 1750 mile range, the retrieving of re-entry rocket items being possible, rather than these items being lost at sea - as was usual at other ranges.

Lester Jones of West Kirby monitored hurricane Felix during summer last year and sent several images on disk, collected from METEOSAT-5's retransmissions of GOES-E images, **Fig. 1** shows the hurricane when off the east coast of the USA.

Kurt Feller sent me a disk containing a dramatic image - see **Fig. 2** - showing a NOAA picture of Europe with sun-glint catching a series of rivers and lakes. The original image was rather dark because of the conditions, so I have enhanced it for the sake of clarity in this publication. Sun-glint is a feature of spring and autumn WXSAT images, where the sun is reflected off water surfaces into the satellite sensors.

Dr Martin van Duinen sent several excellent pictures from Holland where he monitors both a.p.t. and h.r.p.t. from the NOAAs. He uses a Hansen h.r.p.t. system, about which I am afraid I have no information. Martin kindly sent a selection of image printouts from which I just had to include **Fig. 3**, a NOAA-10 (note that!) high resolution picture of Scotland taken on July 25. Also included were several OKEAN and SICH images, prompting Martin to ask how one might differentiate

Fig. 3.

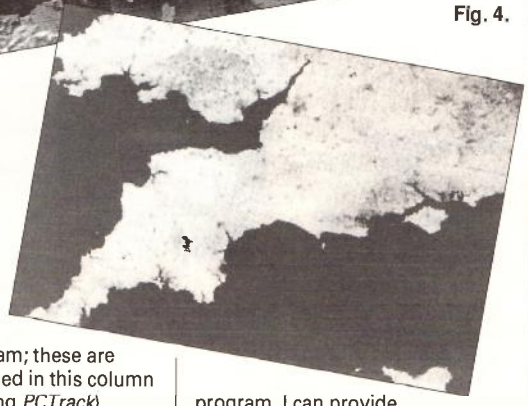

Fig. 4.

between images from the two CIS oceanographic satellites? I would suggest that the first method involves correlating the times of passes using a good satellite predictions program; these are regularly mentioned in this column (my favourite being *PCTrack*). Using current Kepler elements, identification in real-time is then obvious. Identification of recorded data requires more planning! If the image includes a 'time' indicator (the numbers sometimes included in the telemetry) then these can be decoded - I shall cover that on another occasion.

A further method requires identification of the scene and a comparison of the tracks covered by the two satellites. Both appear to be able to provide similar picture content, whether visible, radar or microwave, or some combination, so the time of data acquisition is important for satellite confirmation. Another picture from Martin will be included in a future edition.

Another European reader, **Peter Schoen** of Germany, has sent high resolution pictures taken with his h.r.p.t. system. How excellent they are! His antenna is located in the backyard, surrounded with houses, so that data reception starts at about 10° elevation, though Peter comments that this also acts as a wind break, enabling him to track during strong winds. He tracks the dish manually. Like Martin, Peter's results are superb - see **Fig. 4** that shows my neck of the woods - so I shall include further pictures in a future edition. He also has an a.p.t. system, fed by a crystal-type receiver, and decoded and enhanced using the JVFAX software.

Pictures for Beginners

Several correspondents, including **B. Parylo** of West Yorkshire, have enquired about the possibility of obtaining some images on disk in order to see what is currently obtainable from the different WXSATs. I am putting together a selection of images on to a standard HD 3.5in disk. If any reader would like a copy, please send an HD (1.44MB) disk, together with an s.a.e. and 50p coin (or equivalent), and I shall send it by return. If you also need a display program, I can provide one - for the PC only I'm afraid.

WARC 1995 - WXSAT Frequencies

A previous edition of 'Info' mentioned the meeting known as WRC-95 (World Radio Conference-1995), concerning the allocation of radio frequencies to utility operations, that could have all but destroyed the meteorological facilities used by the 137 and 1690MHz bands.

Three major WXSAT issues were dealt with at the WRC:

- a Brazilian proposal to expand use of the 137-138MHz a.p.t. band by eliminating the protection WXSATs have in part of the band;
- a US proposal to introduce other utilities into the 401-404MHz band, used by data collection platforms (DCPs) transmitting to ARGOS, GOES and other WXSATs;
- Brazilian and Canadian proposals to eliminate the interim protection given to WXSATs in the 1675-1710MHz band until compatibility studies are complete. This last band is used by both h.r.p.t. and WEFAX.

The result: all three proposals failed. The 137MHz proposal was withdrawn after being widely criticised by other delegations. For the 1675-1710MHz proposals, the ITU (International Telecommunications Union) was asked to study the matter with a view to action being taken at WRC-97 (the next meeting). My thanks to **Rick Emerson** for providing access to this information.

NOAA-K Launch Date

I monitor the published launch dates for future satellites using a number of sources on the Internet. Occasionally these dates are inconsistent, as recently happened with dates given for the launch of NOAA-K. Enquiries brought further information from **Jonathan Smith** of the Satellite Sounding Group at the Meteorological Office, in Bracknell. A recent NESDIS Polar Orbiting Environmental Satellite weekly report gave the launch date as 1 August 1996, or rather, that this is 'the revised overall launch readiness date for NOAA-K'. Other sources, such as the Space Calendar, give 29 December 1995 - hence my enquiry. Much depends on the status of NOAAs 12 and 14. NOAA-K could be launched as early as 1 April, but expect the launch to be later than that.

Future Launches

For readers who are interested in having advance information on launches, those currently scheduled include the following:

January 11 - Shuttle STS-72, *Endeavour*, Space Flyer Unit Retrieval.

February 22 - Shuttle STS-75, *Columbia*, Tethered Satellite System (TSS-1R)

March 1 - Astra 1F Proton Launch (Russia).

Help for Amiga Users

A letter from **G. Bickerton** of Northumberland responds to a previous request in this column for information about space-related software for the Amiga computer. He refers to the Amiga Amateur Radio User Group; write to: **Bob Perks G0LBQ, 120 Cranes Park Road, Sheldon, Birmingham B26 3ST.**

Shuttle Monitoring

Many readers have enquired about Shuttle monitoring; **Peter Wade** and **Richard Keen** are two of several who have successfully achieved this. Not all Shuttle passes come over Britain, but when they do, Richard suggests that for direct reception you try 145.84MHz during a pass, particularly when there are amateur radio operators on board.

Frequencies

NOAA 14 a.p.t. on 137.62MHz; NOAA 12 a.p.t. on 137.50MHz; NOAA beacons on 136.77 and 137.77MHz; METEOR 3-5 (or 2-21) uses 137.85MHz; OKEAN-4 and SICH-1 use 137.40MHz occasionally and METEOSAT WEFAX on both 1691.0 and 1694.5MHz.

He heard astronauts chatting with earth-bound hams on two occasions, and on a nearly overhead pass on Friday November 17, he heard Russian being spoken on 130.165MHz, while they were still docked.

Richard also saw the *Atlantis*-Mir complex come over just five minutes before sunrise, looking quite bright at magnitude -3 (for the non-astronomically minded, minus three is almost as bright as planet Venus). Using his 3in telescope, at 30x, he could clearly see two objects ('like a double star, but one object was roundish and the other flatter'). All in all, a good day for shuttle watching/listening. Richard lives in Colorado, USA, about 30 miles north-west of Denver, in the Rocky Mountains at about 3000m elevation.

Mike Gibson wrote from Saltash to tell me of his success monitoring transmissions from Shuttle *Columbia*, relayed from WA3NAN. He found the frequency 14.295MHz (20m band) to be useful, and also monitored *Atlantis* during its link with MIR, using the same frequency. **Leif Lindeskov** also reports hearing the Shuttle on this frequency 'a few times every day' from home in Denmark.

Following many requests from readers, an extra page has been added to the Shuttle pack collection. It now includes a total of eight sides of A4 giving the entire Shuttle manifest - up to the last currently scheduled launch on 4 December 2003, and includes a summary of the abbreviations used in the official manifest. A list of all known Shuttle re-transmission frequencies used by amateur stations throughout the USA is given, as well as the actual frequencies used by the Shuttle itself, and many of those used for NASA and USAF projects. A FAQ (frequently asked questions) on monitoring the Shuttle is included, and finally, by popular request, notes on how to obtain NASA Causeway passes to watch a Shuttle launch.

Two years ago **C. Wileman** of Bideford enquired of the Kennedy Space Centre and obtained a launch pass to watch a Shuttle launch. He describes it as an experience he will never forget. This launch pass information was provided by Australian folk to whom credit is given in the pack. Two colour graphics are included and one or two more may be added. Please enclose at least 50p as well as an s.a.e. when requesting this pack.

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Decode

All the Data Modes

N. McCathie of St Peter Port writes asking for help in using his Sony ICF-SW7600 receiver for utility listening. He is fortunate in having access to a 486 computer, so the easiest way to get started is to use *HAMCOMM* and *JVFAX* software with a ready-built interface such as that available from Pervisell. The interface simply plugs into the computer's serial port with the 3.5mm jack plug connected to the receiver. The connection point at the receiver will depend on the specific model in question but I always recommend using a line or tape out jack if at all possible. This connection is best because it provides a steady output signal that's not effected by the setting of the volume control.

In a few cases you may find that the output level from the tape or line output of your receiver may be too low for your decoder. You will than have to use the external speaker or headphone connection. This has two disadvantages:

a) it usually cuts off the internal speaker and

b) you need to carefully set the volume control level.

The first problem can at least be partly overcome by using what's known as a 'Y' connector. This comprises a 3.5mm jack that splits into two 3.5mm sockets. One of these can be used to connect your decoder whilst the other can be used to feed an external speaker. If you still want to be able to separately control the speaker volume you could either use a speaker with a built-in volume control or fit a simple volume control yourself.

Andrew Cooke of Grimsby also has a few problems getting started. He is concerned about interference and wonders if it would be possible to record RTTY signals as a .WAV file for later playback into *HAMCOMM* or similar decoding packages. Whilst it is feasible to record audio on hard disk you would have to pick a sampling rate that provides a compromise between record quality and available disk space. The real problem comes when you try to feed to recovered signal into *HAMCOMM* as you won't be able to run your playback software and *HAMCOMM* at the same time! The only solution would be two computers. You can of course use more conventional recording systems to store Utility signals, but don't expect very good results unless you use a good quality recorder. Most decoders don't respond well to the speed fluctuations commonly found in the cheaper recording systems.

Amiga FAX & SSTV

I've just received details of a new German FAX and SSTV package for Amiga computers that could well be of interest to utility listeners. The new system comes from MSoft and is known as Amiga *ScanMate*. Although initially designed for the amateur market it also makes an excellent receive-only system. The SSTV modes provided are very comprehensive and include all the latest variants. Of particular interest is the new *ScanMate* high definition mode that supports a resolution of 320 by 512 pixels.

For FAX reception, *ScanMate* features all the standard drum speeds, i.e. 60, 90, 120, 240 and 360 r.p.m. along with IOCs of 204, 288 and 576. The maximum resolution of the FAX modes is 1024 x 1024 pixels. FAX operation is further supplemented with a built-in 64 event timer that can be programmed with day, time and reception parameters. This is particularly helpful for unattended reception of late night/early morning FAX charts.

Another very useful feature is the provision of slant correction for FAX images. Whilst most FAX systems provide slant correction that can usually only be activated during reception. The *ScanMate* system allows correction after the image has been received.

If there's a secret ingredient with the *ScanMate* system it's in the special d.s.p. interface. Rather than use conventional audio filters the systems has its own built-in processor to handle the signal conditioning. This interface also supports software switching between up to three receivers or transceivers.

The system requirements are an Amiga computer with 1Mb RAM (AGA 2Mb), DOS 2.0 or higher and a hard disk. If you're also thinking of using the *ScanMate* from transmission you will also need a VLab video digitiser.

The current prices for the *ScanMate* are DEM448 for a single transceiver version, DEM598 for three transceivers or DEM698 for the three transceiver version plus an a.m. option for satellite reception.

For more details contact **MSoft** via **Michael Strecke, Brabanter STR.5, D-50674 Cologne, Germany**.

PIAB Bonn Schedule

Here's the latest schedule for this station received on December 1st 1995.

Time (UTC)	Area	Freq (MHz)	Callsign
0645-0845	Europe	7.916	DGG91L2
0830-1030	Mid East	13.4386	DGN43H1
0830-1030	Africa	18.7042	DGS70H5
0830-1030	Africa	13.5709	DGN57L1
1345-1445	Europe	7.916	DGG91L2
1600-1800	Asia	9.3619	DGJ36L1
1600-1800	Asia	7.916	DGG91L2

The QSL address for PIAB is; **Pressure und informanipulationsanstalt dieser eurer Bananenrepublik; Welckerstr. 11; D-53113 Bonn, Germany**.

Korean News

Brian Webb in Thousand Oaks California has sent in a good press photo that he received from KCNA Pyongyang in North Korea on December 9 at around midnight. The station callsign was HMF52 and the operating frequency was 11.4761MHz with an IOC of 288 and 60 r.p.m. drum speed. Can anyone explain the photo - it looks very old, but was probably taken recently.

Balanced Interface

One of the many interference cures to pass through this column is the use of a microphone transformer to isolate the receiver from the computer. An alternative system that will help reduce what's known as common mode interference is to employ a balanced feed between the receiver and computer. This system may well be particularly beneficial for those using portable receivers for utility monitoring. **Gordon West** of Olney has written this month with just such a suggestion. His design, see **Fig. 1**, uses the balanced input of a 741 Op-Amp to create a new interface.

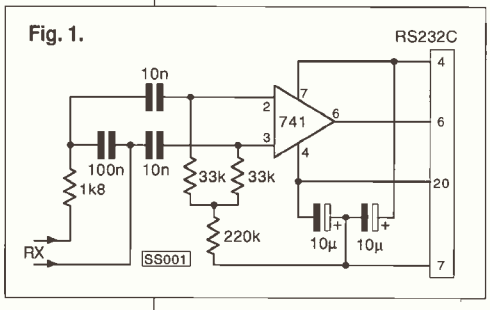


Fig. 1.

As you can see the circuit is very simple and Gordon has built the prototype on a small piece of Veroboard that is mounted inside the 25-way D-type connector. You may be able to further improve the design with a faster op-amp such as the popular LF-351. If you have any neat interface designs please drop me a line with the details.

Demon ROMPS

Yes I'm afraid there's yet another buzz-word for Internet users. Demon Internet are one of the major UK suppliers of Internet services to the general public and have built-up a substantial network. However, they have in the past been criticised for network overload and not providing local call access throughout the UK. Demon have now tackled both these problems through a new link-up with Mercury Communications.

Whilst their earlier network was supplied through Energis it soon became clear that Energis would not be able to expand their network fast enough to meet demands from Demon customers. It was this that triggered Demon to supplement their network with links into the Mercury network. At the same time they have chosen to move away from the term vPoPs (virtual Points of Presence) to ROMPs (Regionally Organised Modem Pool).

At the time of writing there were three active ROMPs serving various regions of the country. However, the important point about ROMPs is that they provide access to the Demon network at local call rates from anywhere in the UK. This provides a significant cost saving for users, especially if you time your calls to take advantage of BT's 1p per minute Weekend Rate. For more information of local access numbers, contact Demon at URL **http://www.demon.co.uk/dispatches** Alternatively you can phone Demon on 0181-371 1000.

Shareware CD-ROM

Although I don't usually mention general computer software in this column, a recently received CD-ROM warrants mention. In the past couple of years I've looked at lots

UT96- sorted by Freq.

File Search Edit Help

Freq.	Callsign	Station	Country	Modulation	Details
6330.0	LZW 34	Varna R	BUL	CW/RTTY	SITOR
6330.0	XSG	Shanghai R	CHN	RTTY	
6330.5		coast stations, channel		RTTY	QSX 6284.5 kH
6331.0	worldwide	coast stations DSC frec		RTTY	QSX 6312.5 kH
6331.5	worldwide	coast stations DSC frec		RTTY	
6332.0	worldwide	coast stations DSC frec		RTTY	
6333.5	XSZ	Dalian R	CHN	CW	
6334.5	UFM 3	Nevelsk R, FE	RUS	CW	
6335.5	DZI	Bacoor R	PHL	CW	
6335.5	IGJ 43	IN Augusta	I	CW	
6335.5	VFF	CCG Iqaluit, NWT	CAN	CW	
6336.3	MTO	RN Rosyth	G	RTTY	ITA2 75 Baud
6337.0	CBV	Valparaiso R	CHL	CW	
6337.0	EDG 2	Madrid R	E	CW	
6337.0	PKG	Banjarmasin R	INS	CW	
6337.0	PKP	Dumai R	INS	CW	
6337.0	UCE	Arkhangelsk R	RUS	CW	
6338.6		Berlin	D	RTTY	VFT ARQ-E 72
6339.5	ZLO 3	RNZN Auckland	NZL	CW	
6340.5	F2C	Aasab R	FRI	CW	

1996 Super Frequency List.

Readers Special Offers

Here's the latest list of reader' special offers. Whilst I do my best to return orders promptly, please allow up to two weeks for delivery.

IBM PC Software(1.44Mb disks):
Disk 1 (Order Code DK1) - JVFAX-7.0, HAMCOMM 3.0 and WEFAX 3.1
Disk 2 (Order Code DK2) - DSP Starter plus Texas device selection software.
Disk 3 (Order Code DK3) - Ultrapak 4.0 and NuMorse
Disk 4 (Order Code DK4) - Mscan 1.3 and 2.0
Printed Literature:
Beginners Utility Frequency List (Order Code BL)
Complex Signals Utility Frequency List (Order Code AL)
Decode Utility Frequency List (Order Code DL)
FactPack 1 Solving Computer Interference Problems (Order Code FP1)
FactPack 2 Decoding Accessories (Order Code FP2)
FactPack 3 Starting Utility Decoding (Order Code FP3)
FactPack 4 JVFAX and HAMCOMM Primer (Order Code FP4)
FactPack 5 On the Air with JVFAX and HAMCOMM (Order Code FP5)
FactPack 6 Internet Starter (Order Code FP6)

For the printed literature just send a self-addressed sticky label plus 50p per item (£1.50 for four, £2.50 for 7 and £3.00 for 9). For software send £1.00 per disk (£1.75 for 2, £2.50 for 3 or £3.00 for all 4) and a self-addressed sticky label (don't forget I provide the disk!).

of shareware CD-ROMs packed with potentially useful programs and data. However, I usually find that there is very little information supplied regarding what the various programs are supposed to do. The only option being to waste lots of time installing them to check them out. Not so with the *Best of British* CD-ROM supplied by The Thompson Partnership.

This CD contains a host of useful programs, including the *Geoclock* grey-line predictor. What sets this apart from the rest is the excellent browser that lets you scan through the available programs, view screen shots and read comments on the programs function and system requirements. Where the program could be run from the CD there was a software button provided to do this. If you decided you liked the program another button click started an automatic installation process. Overall an excellent collection of software very well presented. Just to complete the picture the CD-ROM costs just £5.00 plus VAT and is available from **The Thompson Partnership, Lion Buildings, Market Place, Uttoxeter ST14 8HZ**. My thanks to Steve Townsley for the supply of the review copy.

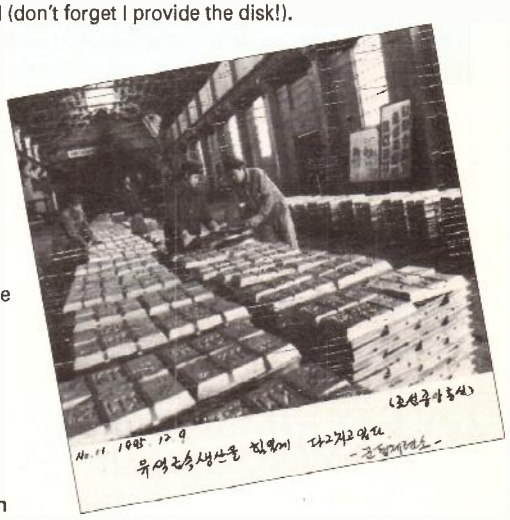
Klingenfuss News

This month sees two new releases from Klingenfuss Publications - *1996 Guide To Utility Stations* and the *1996 Super Frequency List CD-ROM*. Although the unfavourable exchange rates have hit the UK prices quite badly the *Guide to Utility Stations* remains the definitive and most up-to-date guide available. The latest version follows a very similar format to its predecessors, but with a few very worthwhile improvements.

The most noticeable change is the use of a much denser printing ink that makes the text very much easier to read. The review copy also appeared to have an improved binding that will go a long way to improve the life of these much used reference books. As far as the content goes, all the regular sections remained, including the popular FAX and press schedules.

The 1996 Super Frequency List on CD-ROM is much improved over last year's version. Gone is the restrictive frequency viewing and you can now browse a whole screen full at a time. You also have a wide range of search facilities so you can seek countries, frequencies, stations, languages, callsigns, times and modulation systems. For a CD-based system with no files downloaded to your hard disk the search and retrieval time were very good. Of course this can be improved still further if you have a high speed CD-ROM drive.

In addition to containing some 14500 frequencies from the *Guide to Utility Stations* the disk features 8500 entries for international short wave broadcasting services, 1000 abbreviations and 12820 formerly active utility frequencies. Although I would still like to see the software enhanced to facilitate the downloading of frequencies into the receiver, the current offering is very useful. The disk is only available for PCs running Windows 3.1 or later. For more information on these publications contact the *SWM* Book Store.



FAX received by Brian Webb.

NAVTEX Listings

This listing is a compilation of all the stations known to be assigned to alphabetic identifiers. Many of the European stations may well be receivable in the UK. My thanks to **Day Watson** for compiling the data.

ID	Station	
A	CROSS Corsen(Brest), Fr.	
A	Miami, Fl. USA.	
A	Novorossiysk, Russ.	
B	Bodo, Nor.	
B	Bermuda.	
B	Mariupol, Ukraine.	
C	Murmansk, Russ.	
C	Odessa, Ukraine.	
C	Sept-Iles, Qb. Can.	[In English]
D	Finisterre, Sp.	[On test poss. opernl]
D	Istanbul, Turk.	
D	Sept-Iles, Qb. Can.	[In French]
E	Samsun, Turk.	
F	Arkhangelsk, Russ.	
F	Horta, Azores.	
F	Antalya, Turk.	
F	Boston, Mass. USA.	
G	Cullercoats, Eng. UK.	
G	Tarifa, Sp.	
G	Kyneria, Cyprus	[Not approved by IMO]
H	Bjuroklubb, Swed.	
H	Iraklion, Crete.	
I	Izmir, Turk.	
I	Las Palmas, Canaries.	
J	Gislovshammer, Swed.	
J	Varna, Bulg.	
K	Kerkya, Gr.	
K	Boston, Mass. USA	[Ice reports only]
L	Rogaland, Nor.	
L	Limnos, Gr.	
M	Cyprus	
M	Casablanca, Mor.	[Planned]
N	Ismailia, Egypt.	
N	Portsmouth, USA.	
O	Portpatrick, Scot. UK.	
O	Malta.	
O	St. Johns. NS. Can.	
P	Netherlands CG, Neth.	
P	Haifa, Isrl.	[Planned]
Q	Split, Croatia.	
Q	Sydney, NS. Can.	[In English]
R	Reykjavik, Ice.	
R	Monsanto, Port.	
R	San Juan, PR.	
R	Rome, It.	[Planned]
S	Niton, Eng. UK.	
S	Sydney, NS. Can	[In French]
S	Augusta, Sicily.	[Planned]
T	Oostende, Belg.	
T	Cagliari, Sardina.	[Planned]
U	Stavsnais, Swed.	[replaced Tallinn]
U	Ancona, It.	[Planned]
U	Yarmouth, NS. Can.	[In English]
V	Vardo, Nor.	
V	Yarmouth, NS. Can.	[In French]
W	CROSS La Garde (Toulon), Fr.	
X	Cartwright, Nfld. Can.	
X	Palma, Majorca.	[Planned]

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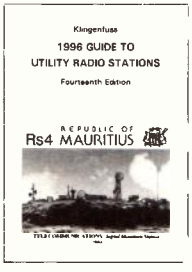

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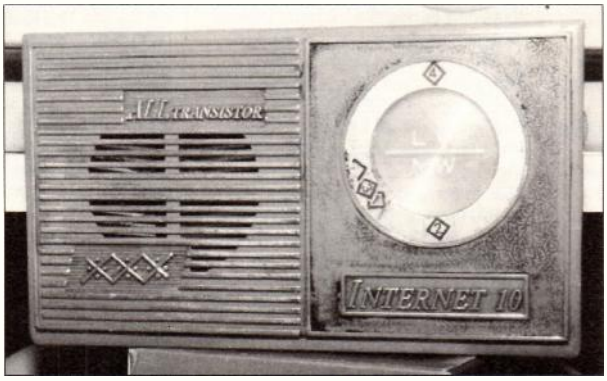
ShackWare

Some of the 30 or so computers in my shack.

Hello and welcome to the first *Short Wave Magazine* quarterly radio and computing column. Let me begin by apologising to all those who decry the inclusion of computers in their favourite magazine. To them I'd like to say that this column isn't devoted to the waxing and waning of the computer industry – the high street newsagents are full to bursting with magazines offering just that, and I heartily sympathise and agree with your objections.

What the column is about, are the issues which arise from the ever-deepening relationship between radio and computers and, specifically, about how a machine in the shack can help you to get the most from your hobby. In coming instalments I hope to review useful software and hardware, detail home-brew add-ons, explain how to access bulletin boards, the Internet and much more.

But let's start by setting the scene with a run down of what makes up my computer collection: an 040 Apple Mac, a 386 PC, an Atari ST, Archimedes A3000, and an Atari 8-bit, a Spectrum and Amstrad CPC (as well as other more obscure 8-bits such as the Oric 1, Atmos, and Dragon), several laptops including the Z88 and Tandy 102, and palmtops including the Psion Series 3 and Atari Portfolio. Is there anything among that lot you feel special affection for? Write and tell me about it.



Just to show that the Internet is not as modern as you might think.

My station consists of a Lowe HF-225, Sangean ATS-803A, an ancient Heathkit SW717, Vega VEF206 (plus other Russians), AOR AR1500, and a kit-built WXSAT receiver. A number of random wire antennas in a variety of locations around the garden give good service and they're routed through a home-brew a.t.u. that gives minimal selectivity but helps enormously with all the electrical noise from the computers! I'm afraid I'm a bit of a jack-of-all-trades when it comes to listening, and monitor everything from the broadcast bands to v.h.f./u.h.f. scanning, with data modes decoding, weather satellite monitoring and maritime beacons included in between. DCF54 is my all-time favourite utility station, and the commonplace but comforting Kremlin chimes my favourite sound on the broadcast bands.

Alternative Approach?

For many, the IBM PC and compatible is the computer of choice for the shack (and wisely so, given its level support), but there are lots of other machines – many available for just a few pounds at boot sales and the like, which can be used to good effect. I hope that this column will become a forum for those who – like me – derive a lot of fun from keeping 'obsolete' alternative micros in the front line, or who want to acquire a computer for basic tasks around the shack without spending a lot of money.

I have a special affection for the excellent Atari 8-bit machines, and I'll be mentioning them regularly in coming columns. There are, however, a number of other computers from yesteryear which, given the right software and a bit of tweaking, will rival systems costing many hundreds of pounds.

The Spectrum was particularly well supported with commercial software, and a flick through back issues of *SWM* shows output from the machine featured regularly. A good example was reader Jim Richardson's FAX submission in Mike Richard's 'Decode' column from October 1992. Jim decoded a transmission from US Navy station NAM on 9.318MHz and the result is an outstanding greyscale GOES image of America. The machine was running what must have been powerful decoding software from Technical Software, and the company's advert in the same issue lists a wealth of exciting radio-oriented packages for other 8-bit computers.

The Commodore 64 and BBC B were also well supported, and there are others such as the CP/M-capable Amstrad CPC and PCW range for which everything from QSL databases to Yagi calculators can be found.

Ironically, the ultimate in alternative computing is probably an early example of what's popular today. My own 386 PC for example, is powerful enough for all kinds of useful work. It's a PS/2 machine complete with poorly-supported MCA expansion slots, but it cost just £35! The machine has 2Mb of RAM, VGA graphics, bus mouse port and so on. It runs JVFAX and Hamcomm (including the latter's 'scope and tuning functions) like a dream.

If your wad stretches to a Pentium-based machine, fine, but a no-frills shack workhorse will cost tens rather than thousands of pounds and reward you with competent performance. So while news and reviews of the very latest in radio-related hard and software for the Mac and IBM PC are very important, there'll be space here for the old 'uns.

Software exchange

Tracking down radio-oriented software is difficult enough for even devoted computer enthusiasts with IBM PCs – for those to whom computing is a secondary pursuit the task is often impossible – especially if they own a Mac, Atari ST, Archimedes or the like. That's why I'd like to start a 'software exchange' scheme that will make available items of hard to find public domain and shareware software.

There'll be no charge for this service short of basic disk (or cassette!), postage and packaging costs. Alternatively, a blank formatted disk and an s.a.e., and the service will be entirely free.

What is required however, is software. That is, if you've tracked down a particularly rare shareware APT decode package for the Oric 1 or Atmos for example, send it in and, via the column, I'll make it available to anyone who wants it. In that way, we can all make full use of the computers in our shacks.

And Finally...

While I own around 30 computers from almost as many manufacturers, I can't claim to be expert with all of them. If you feel able to offer help, or have a selection of radio-oriented hints and tips, particularly for the more obscure machines, why not share them with the rest of us? Drop me a line, your input will be greatly appreciated.

Until next time,
good listening.

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

LM&S

Long, Medium and Short Waves

Since the earliest days of 'wireless' listeners have sent reports on reception to broadcasters. In return they received confirmation (QSL) by card or letter.

A growing number of broadcasters are reluctant to respond in that way. They now want your opinion of their programme(s) as well as an honest SINPO rating.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless otherwise stated, all logs were compiled during November.

The transmitter at Saarlouis, Germany on 183kHz (2000kW) was 'off air' on some nights during November, so **Simon Hockenhull** (E.Bristol) used the opportunity to listen for others on or near the frequency. On 180 he heard a faint foreign language transmission, which may have come from the TRT 2000kW outlet at Polatli, Turkey.

Whilst checking the band at 2200UTC on November 19 **Fred Pallant** (Storrington) picked up a broadcast in Italian from Radiotelevisione Italiana (RAI) via their 10kW outlet at Caltanisseta, Italy on 189. He rated the transmission SINPO 23342. The sky waves from that station were also received after dark by **Paul Bowery** in Burnham-on-Crouch.

Unusual conditions were sometimes present during daylight and reception was then exceptionally good. **George Millmore** (Wootton, IoW) was surprised by the strength of some signals he received at 1015 on November 23 - Topolna, Czech Rep on 270 was a potent SIO555, Raszyn, Poland 1018 was SIO444 and Minsk, Belarus 279 was SIO333. An unidentified transmission under R.Monte Carlo via Roumoules on 216 (1400kW) was heard during daylight by Simon Hockenhull.

Medium Wave Reports

During November a dramatic improvement in the propagation at night of m.w. transmissions over transatlantic paths was evident. Favourable conditions were observed during the early hours of November 6, 10 & 11 by **Harry Richards** (Barton-on-Humber); 6 & 19 by **Robert Connolly** (Kilkeel); 10/11 by **Eric Duncan** (St.Andrews); 11 & 23 by Paul Bowery; 17 & 24/25 by **Roy Patrick** (Derby); 20, 22, 25 & 26 by **John Slater** (Scalloway, Shetland); 22-26 by **David Edwardson** (Wallsend); also by **Richard Reynolds** in Guildford.

Eric Duncan compiled his list between 2330 and 0130 on the night of November 10/11. He says "I hope we can have more nights like this one before the sunspots appear in large numbers!" David Edwardson listened for about an hour each night (Nov 22-26) and heard twenty seven stations, but only twelve could be identified. He described the conditions as "fantastic".

In the reverse direction the broadcasts from Kvitsoy, Norway (1200kW) on 1314 reached E.Canada. They were heard surprisingly clearly at 0410 on the 25th by **Alan Roberts** in Quebec. On two evenings they could be received with an ordinary portable set!

The broadcasts from some stations in Asia, the Middle East and N.Africa were also received here after dark - see chart. Early in the month David Edwardson logged All India Radio via Nagpur (1000kW) on 1566 as 24542 at 2306. The Egyptian Radio 10kw outlet at Matruh on 1593 was heard at 0253 by Paul Bowery on the 17th - it rated 24333. The same programme was being carried by the 500kW Santah transmitter on 864. Good reception after dark from many of the stations in Europe, Scandinavia, Russia and the CIS was also reported. Over in Newry, **Eddie McKeown** picked up the sky waves from the Bayerisher Rundfunk 0.2kW outlet at Hof on 520, which rated 35132 at 0045.

While searching the band during the afternoon for the ground waves from distant local radio stations **Sheila Hughes** (Morden) encountered interference due to the early arrival of sky waves from some stations in Spain. In Leicester, **Andrew Stokes** has found reception of Viva 963 to be quite good until dusk, when the sky waves from the 600kW Pori transmitter in Finland cause severe co-channel interference.

Short Wave Reports

Owing to the solar sunspot minimum the **25MHz (11m)** band will be unusable for broadcasting in 1996.

The conditions in the **21MHz (13m)** band are unstable, but during favourable periods reception from some areas has been good. R.Australia's broadcast to Asia via Darwin on 21.725 (Eng 0630-1100) has often reached the UK clearly. It was rated 43333 at 0900 by **Bernard Curtis** in Stalbridge; SIO344 at 0930 by **Kenneth Buck** in Edinburgh; 44444 at 1005 in Morden; 45444 at 1045 by **Tony Hall** in Freshwater Bay, IoW.

Also logged during the day were Slovak R.Int via Rimavska Sobota 21.705 (Eng to Australia 0830-0857) 25432 at 0844 by **Tim Allison** in Middlesbrough; DW via Julich? 21.680 (Eng to S.E.Asia 0900-0950) 24222 at 0916 by **Rhoderick Illman** in Oxted; UAER, Dubai 21.605 (Eng to Europe 1030-1055) 25333 at 1055 in E.Bristol; R.Portugal Int 21.720 (Port to Africa 0900-1100) 33443 at 1055 in Kilkeel; UAER, Dubai 21.605 (Eng to Europe 1330-1355) 54353 at 1333 in Newry; BBC via Limassol, Cyprus 21.470 (Eng to E.Africa 1300-1700) 24442 at 1444 in Storrington; BBC via Ascension Is 21.660 (Eng to W/E/S.Africa 1100-1700) 34433 at 1646 by **John Eaton** in Woking; WYFR Okeechobee, USA 21.745 (Eng to Europe 1600-1700?) 33333 at 1630 by **Thomas Williams** in Truro; Monitor R.Int via WSHB 21.640 (Eng to E.Africa 1600-1800) 15331 at 1730 by **Darren Beasley** in Bridgwater; HCJB Quito, Ecuador 21.455 (Eng, u.s.b. + p.c.) 25422 at 1823 by **Gerry Haynes** in Bushey Heath.

Unreliable propagation conditions have also been evident in the **17MHz (16m)** band. The broadcasters using this band during the morning include R.Japan via Yamata 17.810 (Eng to S.E.Asia) 35553 at 0610 by **John Parry** in Larnaca, Cyprus; R.Australia via Carnarvon 17.715 (Eng to Asia, Pacific 0100-0900) SIO243 at 0832 in Woking; R.Tunisia Int via Sfax 17.500 (Ar, Fr to N.Africa 0700-?) 44444 at 0909 in Newry; DW via Rwanda 17.800 (Eng to S/E.Africa 0900-0950) 24333 at 0933 in Oxted; R.Portugal via Sines? 17.680 (Eng to Africa? 1000-1200 Mon-Fri) SIO222 at 1029 by **Ted Walden-Vincent** in Gt.Yarmouth; AIR Delhi 17.387 (Eng to Pacific areas 1000-1100) 23322 at 1031 in Bridgwater; BBC via Ascension Is 17.830 (Eng to W/C.Africa 0730-2100) 42442 at 1105 in Kilkeel; R.Pakistan, Islamabad 17.895 (Eng to Europe 1100-1120) 55555 at 1112 by **Chris Shorten** in Norwich; DW via Meyerton, S.Africa 17.765 (Eng to W.Africa 1100-1150) 35333 at 1113 in Bushey Heath.

Those noted after mid-day were Israel R, Jerusalem 17.545 (Heb [Home Sce rly] to Europe, N.America 0800-1700) 45554 at 1208 in Wallsend; Voice of Russia 17.860 (Eng WS) 54554 at 1225 by **Stan Evans** in Herstmonceux; Voice of Russia 17.840 (Eng WS) 44333 at 1310 in Truro; R.Romania Int, Bucharest 17.745 (Eng to Europe 1300?-1400?) 45444 at 1346 by **Michael Griffin** in Ross-on-Wye; RFI via Moyabi, Gabon 17.560 (Eng to M.East 1400-1500) 35543 at 1430 by **Ross Lockley** in Galashiels; DW via Antigua, W.Indies 17.765 (Ger to ? 1200?-1700?) 34443 at 1458 by **Ted Harris** in Manchester; Africa No.1, Gabon 17.630 (Fr to W.Africa 0700-1600) 44444 at 1505 by **George Tebbitts** in Penmaenmawr; WYFR Okeechobee, USA 17.760 (Eng to Europe, Africa 1700-1945) 44444 at 1800 in Morden and 35443 at 1930 by **Eric Shaw** in Chester; Monitor R.Int via WSHB 17.510 (Eng to Africa 1800-2000) 35443 at 1920 in Middlesbrough.

Good reception from some areas has been noted in the **15MHz (19m)** band. During the early morning UAER Dubai 15.435 (Ar, Eng to F.East 0415-0600) was 45554 at 0535 in Larnaca, Cyprus; R.Kuwait via Kabd 15.495 (Ar to M.East, N.Africa 0400-1305) SIO322 at 0617 in Gt.Yarmouth; R.Australia via Darwin 15.245 (Eng to Asia, Pacific 0200-0900 [Sports Sce 0100-0630 Sat]) 24322 at 0654 in Bushey Heath; R.Japan via Moyabi, Gabon 15.165 (Eng to Europe, M.East, Africa 0700-0800) 32332 at 0725 in Herstmonceux.

Later, AWR via Slovakia 15.620 (Eng to Africa 0900-1000) was 55555 at 0900 by **Clare Pinder** in Appleby; BBC via Ascension Is 15.400 (Eng to W.Africa 0730-1130) 42233 at 0910 in Stalbridge; BCC via Pali, Taiwan 15.125 (Chin to C.Asia 2100-1700) 54544 at 0932 in Guildford; China R.Int via Russia 15.440 (Eng to Europe 0900-1055) 33222 at 0940 in Morden; Voice of Greece, Athens 15.650 (Gr, Eng to Australia, Europe 0800?-0950) 54325 at 0950 by **Robert Frost** in Felixstowe; AIR via Aligarh? 15.050 (Eng to N.E.Asia 1000-1100) 44444 at 1030 in Galashiels; BBC via Limassol, Cyprus 15.575 (Eng to M.East, W.Asia 0930-1500) 35433 at 1051 in Middlesbrough; Voice of Malaysia, Kajang 15.295 (Mand to S.Asia 1030-1230) 24332 at 1100 in Scalloway; R.Australia via Darwin 15.530 (Eng to S.Asia 1100-1300) 44434 at 1105 in Freshwater Bay and 33433 at 1230 in E.Bristol; BBC via Masirah Is, Oman 15.310 (Eng to S.Asia 1000-1500) 33443 at 1120 in Kilkeel.

After mid-day VOIRI Tehran 15.260 (Eng to S.Asia 1130-1230) was 22322 at 1205 in Bridgwater; R.Finland via Pori 15.400 (Eng to N.America 1230-1300) 54344 at 1256 in Norwich; RDP Portugal 15.200 (Port to USA 1200-

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	H*
153	Donebach	Germany	500	A,B,C,D,E,F*,G,H,I*,J
162	Allouis	France	2000	A,D,E,F,G,H,I,J
171	Nador Medi-1	Morocco	2000	H*,J
171	Kaliningrad	Russia	1000	A,C,F*,G,H*,J
177	Oranienburg	Germany	750	A,B,G,H*,J*
183	Saarlouis	Germany	2000	A,D,E,F,G,H,I,J
189	Caltanissetta	Italy	10	A*,H*
198	Droitwich BBC	UK	50	A,D,F,G,I,J
207	Munich	Germany	500	A,B*,C*,F*,G,H,I,J*
216	Roumoules RMC	S.France	1400	A,C,D,E,F*,G,H,J
225	Raszyn Resv	Poland	?	A,C,D*,F*,G,H,I*,J*
234	Beidweiler	Luxembourg	2000	A,D*,E,F,G,H,I*,J
234	Grigoriopol	Moldova	1000	A*
243	Kalundborg	Denmark	300	A,C,D*,E,F,G,H,J
252	Tipaza	Algeria	1500	A,D*,G*,H*,J*
252	Atlantic 252	S.Ireland	500	A,D,F,G,H,I,J
261	Burg(R.Ropa)	Germany	200	A,B,D*,E,F*,G,H,J
270	Topolna	Czech Rep	1500	A,C,F,G,H,I*,J*
279	Minsk	Belarus	500	A*,D*,E,F*,G,H,I*,J*

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

Listeners:-
(A) Paul Bowery, Burnham-on-Crouch.
(B) Ted Harris, Manchester
(C) Simon Hockenhull, E.Bristol.
(D) Sheila Hughes, Morden.
(E) Rhoderick Illman, Oxted.
(F) Eddie McKeown, Newry.
(G) George Millmore, Wootton, IoW.
(H) Fred Pallant, Storrington.
(I) Tom Smyth, Co.Fermanagh.
(J) Andrew Stokes, Leicester.

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof-Saale (BR)	Germany	0.2	K*
531	Ain Beida	Algeria	600	B*,D*,L*,Q*,R
531	Leipzig	Germany	100	F*,K*,L*,R
531	RNE5 via ?	Spain	?	K*,L,R
531	Beromunster	Switzerland	500	B
540	Wavre	Belgium	150/50	B,J,K*,L,R
540	Solt	Hungary	2000	B*
540	Sidi Bennour	Morocco	600	K*,L*,Q*
540	Vitoria(EI)	Spain	10	R*
549	Les Trembles	Algeria	600	B*,K*,L*,R*
549	Thurnau (DLF)	Germany	200	A*,B,F*,K*,L,R
558	Espoo	Finland	100	L*
558	Rostock(NDR)	Germany	20	K*
558	RNE5 via ?	Spain	?	B*,K*,L*,Q,R*
567	Tullamore(RTE1)	Ireland (S)	500	B,H,J,K*,L,R
567	RNE5 via ?	Spain	?	B*,K*,L*,R*
576	Muhlacker(SDR)	Germany	500	A*,B*,F*,K*,L,R*
576	Barcelona(RNE5)	Spain	50	B*,K*,L*,R*
585	Paris(FIP)	France	8	B,J,L,R*
585	Madrid(RNE1)	Spain	200	B*,K*,L*,Q*,S*,R*
594	Frankfurt(HR)	Germany	1000/400	A*,B,F*,J,K*,L*,Q,R*
594	Oujda-1	Morocco	100	L*
594	Muge	Portugal	100	K*,L*,R*
603	Sevilla(RNE5)	Spain	50	K*,L*
603	Newcastle(BBC)	UK	2	Q
612	Athlone(RTE2)	Ireland (S)	100	B,L,Q,R*
612	Sebaa Aioun	Morocco	300	L*
612	RNE1 via ?	Spain	10	B*,K*,R*
621	Wavre	Belgium	80	B,J,K*,L,Q*,R,S*
621	RNE1 via ?	Spain	10	B*
621	Barcelona(OCR)	Spain	50	K*,L*,R*
630	Vigra	Norway	100	B*,K*,L*,R*
630	Tunis-Djedeida	Tunisia	600	D*,K*,L*
639	Praha(Liblice)	Czech	1500	B*,K*,L*,R*
639	RNE1 via ?	Spain	?	B*,K*,L*,R*
648	RNE1 via ?	Spain	10	K*,L*
648	Orfordness(BBC)	UK	500	B,F*,H,L,Q*,R,S*
657	Neubrandenburg(NDR)	Germany	250	B*,F*,R*
657	Napoli	Italy	120	B*,L*
657	Madrid(RNE5)	Spain	20	B*,K*,L*
657	Wrexham(BBCWales)	UK	2	B,I,K*,R
666	MesskirchRohrd(SWF)	Germany	300/180	F*,K*,L*,Q*,R*
666	R.Vilnius	Lithuania	500	K*
666	Lisboa	Portugal	135	B*,K*,L*,S*
675	Marseille	France	600	B*,K*,L*,S*
675	Lopic(R10 Gold)	Holland	120	B,H,J,K*,L,R
684	Sevilla(RNE1)	Spain	500	B*,K*,L*,R*,S*
684	Avala(Beograd-1)	Yugoslavia	2000	B*,K*
693	Tortosa(RNE1)	Spain	2	K*
693	Droitwich(BBC5)	UK	150	B,L,Q,R,S*
702	Flensburg(NDR)	Germany	5	B,F*,K*,L*
702	Monte Carlo	Monaco	40	B*,L*
702	Banska	Slovak Rep.	200	B*
702	Zamora(RNE1)	Spain	10	K*,L*,R*
711	Rennes 1	France	300	B,H,J,K*,L,Q*
711	Heidelberg	Germany	5	B*,F*
711	Laayoune	Morocco	600	L*
711	Murcia(COPE)	Spain	5	R*
720	Langenberg	Germany	200	B,F,L*,R*
720	Lisnagarvey(BBC4)	Ireland (N)	10	H,L,Q,R*
720	Norte	Portugal	100	B*,K*
720	Sfax	Tunisia	200	L*
720	Lots Rd,Ldn(BBC4)	UK	0.5	B,L,R
729	Putbus/Bergen(NDR)	Germany	10	F
729	Cork(RTE1)	Ireland (S)	10	B*,K*,L,Q
729	RNE1 via ?	Spain	?	B*,K*,L*,R*
738	Paris	France	4	B,J,K*,L
738	Poznan	Poland	300	B,K*,L*
738	Barcelona(RNE1)	Spain	500	B*,K*,L*,R*,S*
747	Flevo(Hilv2)	Holland	400	B,J,K*,L,R
747	Cadiz(RNE5)	Spain	10	K*,L*
756	Braunschweig(DLF)	Germany	800/200	B,F*,J,K*,L*,R*,S*
756	Bilbao(EI)	Spain	5	L*
756	Redruth(BBC)	UK	2	K*,L,Q*
765	Sottens	Switzerland	500	K*,L*,R*,S*
774	Sofia	Bulgaria	50	S*
774	RNE1 via ?	Spain	?	B*,I,K*,L*,R*
783	Burg	Germany	1000	B,F*,K*,L*,R*,S*
783	Miramar(R.Porto)	Portugal	100	L*
783	Dammam	Saudi Arabia	100	L*
792	Limoges	France	300	B*,L,S*
792	Lingen(NDR)	Germany	5	B,L*
792	Kavala(VOA)	Greece	500	G*
792	Sevilla(SER)	Spain	20	B*,K*,L*
801	Munchen-Ismaning	Germany	300	B,F*,K*,L*,Q*,R*
801	RNE1 via ?	Spain	?	B*,K*,L*,R*
810	Volgograd	Russia	150	L*
810	Madrid(SER)	Spain	20	B*,I*,K*
810	Westerglen(BBCScot)	UK	100	B,H,I*,J,L*,Q,R,S*
819	Batra	Egypt	450	G*,L*,M,R*
819	Toulouse	France	50	B*,K*
819	Trieste	Italy	25	B*
819	Warsaw	Poland	300	B,K*,L*
828	Hannover(NDR)	Germany	100/5	B,K*
828	Rotterdam	Holland	5	B,J
828	Oujda-2	Morocco	100	L*
828	Barcelona(SER)	Spain	50	R*
837	Nancy	France	200	B,J,K*,L,Q*,S*
837	COPE via ?	Spain	?	K*,L*
846	Rome	Italy	540	B,K*,L*,R*
855	Berlin	Germany	100	K*,S*
855	RNE1 via ?	Spain	?	B*,J*,K*,L*,Q,R*
864	Santah	Egypt	500	B*,L*,R*
864	Paris	France	300	B,J*,L
864	Socuellamos(RNE1)	Spain	2	L*
873	Frankfurt(AFN)	Germany	150	B,C*,F*,J*,K*,L*,R*
873	Zaragoza(SER)	Spain	20	B*,J*,K*,L*
882	COPE via ?	Spain	?	K*,L*
882	Washford(BBCWales)	UK	100	B,I,J*,L,R,S*
891	Algiers	Algeria	600/300	B*,K*,L*,R*
891	Huisberg	Netherlands	20	B,K*,L*
900	Brno(CRo2)	Czech Rep	25	K*
900	Milan	Italy	600	B*,J*,K*,L*,R*
900	COPE via ?	Spain	?	L*,R*
909	B'mans Pk(BBC5)	UK	140	B,L,R*
909	M'side Edge(BBC5)	UK	200	S*
918	Moscow	Russia	75	J*
918	Plesivec(Sloven'nR)	Slovenia	600/100	B*,K*,L*,R*
918	Madrid(R.Int)	Spain	20	B*,K*,L*,R*
927	Wolvertem	Belgium	300	B,J*,K*,L,Q*,R*,S*
927	Velke Kostolany	Slovakia	40	B*
936	Bremen	Germany	100	B,F,K*,L*,R*,S*
936	Venezia	Italy	20	B*,L*
936	RNE5 via ?	Spain	?	K*,L*,R*
945	Toulouse	France	300	B*,K*,L*,S*
954	Brno (CRo2)	Czech Rep.	200	B*,K*,L*,R*
954	Madrid(CI)	Spain	20	B*,J*,K*,L*
963	Pori	Finland	600	B,K*,L*,R*,S*
963	Paris	France	8	K*
963	Tir Chonaill	Ireland (S)	10	L*,Q*
972	Hamburg(NDR)	Germany	300	B,F*,K*,L*,Q*,R*
972	RNE1 via ?	Spain	?	B*,J*,L*
981	Alger	Algeria	600/300	B*,K*,L*,R*
990	Berlin	Germany	300	B,F*,K*
990	R.Bilbao(SER)	Spain	10	B*,J*,L*
990	Redmoss(BBC)	UK	1	K*
999	Schwerin (RIAS)	Germany	20	B*
999	Torino	Italy	20	B*
999	Madrid(COPE)	Spain	50	B*,J*,K*,R*
1008	Las Palmas(SER)	Gran Canaria	10	K*
1008	Flevo(Hilv-5)	Holland	400	B,J*,K*,L,R*,S*
1017	Rheinsender(SWF)	Germany	600	B,F*,H*,J*, K*,L,Q*,R*
1017	Rimavska Sobota	Slovakia	50	B*
1017	RNE5 via ?	Spain	?	B*,K*,L*
1026	SER via ?	Spain	?	R*
1035	Tallinn	Estonia	500	L*
1035	Milan	Italy	50	B*
1035	Lisbon(Prog3)	Portugal	120	K*,L*,R*
1044	Dresden	Germany	250	B,F*,K*,L*,R*
1044	Sebaa-Aioun	Morocco	300	L*,R*
1044	SER via ?	Spain	?	K*
1044	S.Sebastian(SER)	Spain	10	L*
1053	Zaragoza(COPE)	Spain	10	K*
1053	Talk Radio UK via ?	UK	?	B,L,Q,R,S*
1062	Kalundborg	Denmark	250	B,K*,L*,R
1062	R.Uno via ?	Italy	?	B*,R
1062	Norte	Portugal	100	K*
1071	Brest	France	20	L
1071	France-Inter via ?	France	?	R
1071	Lille	France	40	B,J,K*,S*
1071	Riga	Latvia	50	L*
1071	Bilbao(EI)	Spain	5	L*,R
1071	Talk Radio UK via ?	UK	?	R
1080	Katowice	Poland	1500	B*,I*,K*,R
1080	SER via ?	Spain	?	I*,K*,L*
1089	Krasnodar	Russia	300	K*
1089	Talk Radio UK via ?	UK	?	B,I*,L,Q,R
1098	Nitra(Jarok)	Slovakia	1500	B,K*,L*,R*,S*
1098	RNE5 via ?	Spain	?	K*,L*
1107	AFN via ?	Germany	10	B,K*
1107	Talk R.UK via ?	UK	?	B,L,Q,R
1116	Bari	Italy	150	B*,K*,Q
1125	La Louviere	Belgium	20	B,K*,L*,R
1125	Deanovec	Croatia	100	B*,R*
1125	RNE5 via ?	Spain	?	B*,J*,K*,L*
1125	Llandrindod Wells	UK	1	I,J*
1134	COPE via ?	Spain	2	B*,L*,R
1134	Zadar(Croatian R)	Yugoslavia	600/1200	B*,K*,L*,R
1143	AFN via ?	Germany	1	B,K*
1143	Stuttgart(AFN)	Germany	10	R*
1143	R.Due via ?	Italy	?	R*
1143	Bolshakovo(Mayak)	Russia	150	B*
1143	COPE via ?	Spain	2	B*,K*,L*,R
1152	RNE5 via ?	Spain	10	B*,L*,R*
1161	Strasbourg(Flnt)	France	200	B*,J*,K*,L*,R*
1170	Beli Kriz	Slovenia	300	B*
1179	SER via ?	Spain	?	K*,L*,R*
1179	Solvesborg	Sweden	600	B,H,J*,K*,L*,R*,T*
1188	Kuurne	Belgium	5	B,J,K*,L*,R
1188	Reichenbach(MDR)	Germany	5	F,K*,R*
1188	Szolnok	Hungary	135	B*
1197	Munich(VOA)	Germany	300	B*,K*,R*
1197	Virgin via ?	UK	?	B,H,J,L,R,S*
1206	Bordeaux	France	100	B,K*,R*
1206	Wroclaw	Poland	200	B*,J*,K*,L*
1215	Virgin via ?	UK	?	B,J,L,Q,R
1224	Vidin	Bulgaria	500	L*
1224	Lelystad	Holland	25	B,K*,M,R*
1224	COPE via ?	Spain	?	R*
1224	Virgin via ?	UK	?	J,L*,Q*
1233	Liege	Belgium	5	K*
1233	Virgin via ?	UK	?	B,H,J,L*,Q*,R
1242	Marseille	France	150	B,K*,R*
1242	Virgin via ?	UK	?	B*,R
1251	Marcali	Hungary	500	B*,K*,R*
1251	Huisberg	Netherlands	10	K*,L*
1260	SER via ?	Spain	?	K*
1260	Guildford (V)	UK	?	B,L,R*
1269	Neumunster(DLF)	Germany	600	B,F*,J,K*,L*, Q*,R*,S*
1269	COPE via ?	Spain	?	R*
1278	Strasbourg	France	300	B
1278	Dublin/Cork(RTE2)	Ireland (S)	10	B,J,L*,Q*,R
1287	RFE via ?	Czech Rep.	400	B*,K*,L*,R*
1287	Lerida(SER)	Spain	10	K*,L*,R*
1296	Kardzali	Bulgaria	150	L*
1296	Valencia(COPE)	Spain	10	B*,K*,L*,R*
1296	Orfordness(BBC)	UK	500	B*,K*
1305	Rzeszow	Poland	100	B*,K*,L*,R*
1305	RNE5 via ?	Spain	?	K*,L*
1314	R.Due via ?	Italy	?	B*
1314	Kvitsoy	Norway	1200	B,J*,K*,L*,P*,R*,S*
1323	Zyyi(BBC)	Cyprus	200	R*
1323	W'brunn (V.Russia)	Germany	1000/150	B,J*,K*,R*,S*
1323	Moskva	Russia	?	F,I
1332	Rome	Italy	300	B*,J*,K*,L*
1341	Lakihegy	Hungary	300	B*,K*,S*
1341	Lisnagarvey(BBC)	Ireland (N)	100	B,C*,I*,J*, L*,Q,R*,S*
1341	Tarrasa(SER)	Spain	2	L*
1350	Nancy/Nice	France	100	B,J*,K*,L*,Q*,R*
1350	Cesvaine/Kuldiga	Latvia	50	B*,K*
1359	Arganda (RNE-FS)	Spain	600	B*,J*,K*,L*,R*,S*
1368	Foxdale(Manx R)	I.O.M.	20	B,I*,L*,Q
1368	Krakow	Poland	60	B*
1377	Lille	France	300	B,K*,L,R*
1377	Ukraine	Ukraine	50	B*
1386	Bolshakovo	Russia	2500	C*,J*,K*,L*,S*
1386	R.Ned via B'shakovo	Russia	2500	K*,R*
1395	Lushnje(Tirana)	Albania	1000	B*,L*,S*
1395	TWR via Lushnje	Albania	500	C*,J*,K*,Q
1395	Lopic?	Netherlands	?	B,K*,M,R*
1404	Brest	France	20	B,K*,L,S*
1404	Ukraine(UR2) via ?	Ukraine	?	B*
1413	RNE5 via ?	Spain	?	K*,L*
1422	Heusweiler(DLF)	Germany	1200/600	B,F*,J*,K*,L*,R*,S*
1422	Valmiera	Latvia	50	B*
1431	Kopani	Ukraine	500	R*,S*
1440	Marnach(RTL)	Luxembourg	1200	B,C*,J*,K*,L,Q
1440	Damman	Saudi Arabia	1600	K*,R*,S*
1449	Squinzano	Italy	50	B*,J*,L*
1449	Redmoss(BBC)	UK	2	B*
1458	Lushnje(Tirana)	Albania	500	R*
1467	Chisinau	Moldova	50	G*
1467	Grigoriopol	Moldova	500	G
1467	Monte Carlo(TWR)	Monaco	1000/400	K*,L*,R*,S*
1485	AFN via ?	Germany	1	B*
1485	SER via ?	Spain	?	Q*
1485	Homs	Syria	10	S*
1494	Clermont-Ferrand	France	20	B,L*
1494	St.Petersburg	Russia	1000	C*,H*,K*,N*,Q*,R*,S*
1503	Stargard	Poland	300	L*
1512	Wolvertem	Belgium	600	B,H*,I,J*,K, L,N,Q*,R*
1512	Jeddah	Saudi Arabia	1000	B*,K*,S*
1521	R.Beijing	China	500	E*
1521	Kosice(Cizatice)	Slovakia	600	K*,L*,R*
1521	Duba	Saudi Arabia	2000	E*,Q*,S*
1521	R.Manresa(SER)	Spain	2	B*
1530	Vatican R	Italy	150/450	K*,L*,R*
1539	Mainflingen(DLF)	Germany	700	H*
1539	SER via ?	Spain	?	K*,R*
1539	Valladolid(SER)	Spain	5	L*,S*
1557	Nice	France	300	B,S*
1566	Mjadzel	Belarus	10	G
1566	Nagpur	India	1000	E*
1566	Sfax	Tunisia	1200	K*,R*,S*
1566	Odessa	Ukraine	7	G*
1575	Burg (DLF)	Germany	250	L*
1575	Genova	Italy	50	B*,K*,R*
1575	SER via ?	Spain	5	L*,R*
1593	Matruh	Egypt	10	B*
1593	Holzkirchen(VOA)	Germany	150	F*,G*,K*,L*
1593	Chisinau	Moldova	5	G*
1593	Miercurea Ciuc	Romania	14	G*
1593	Dnipropetrovsk	Ukraine	5	S*
1602	SER via ?	Spain	?	S*
1602	Vitoria(EI)	Spain	10	K*,L*,R*
1611	Vatican R	Italy	15	J*

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

Listeners:-

(A) Tim Allison, Middlesbrough.
(B) Paul Bowery, Burnham-on-Crouch.
(C) Bernard Curtis, Stalbridge.
(D) John Eaton, Woking.
(E) David Edwardson, Wallsend
(F) Ted Harris, Manchester.
(G) Gerry Haynes, while in Talgarth, Powys.
(H) Simon Hockenhull, E.Bristol.
(I) Sheila Hughes, Morden.
(J) Rhoderick Illman, Oxted.
(K) Eddie McKeown, Newry.
(L) George Millmore, Wootton IoW.
(M) Roy Patrick, Derby.
(N) Clare Pinder, while in Appleby.
(O) Harry Richards, Barton-on-Humber.
(P) Alan Roberts, Quebec, Canada.
(Q) Tom Smyth, Co.Fermanagh
(R) Andrew Stokes, Leicester.
(S) Norman Thompson, Oadby.
(T) Thomas Williams, Truro.

2000 Sat/Sun) 35553 at 1337 in Wallsend; WWCR Nashville, USA 15.685 (Eng to Europe 1100-2100) 44444 at 1520 in Penmaenmawr; Channel Africa via Meyerton 15.240 (Eng to C/W Africa 1600-1700) 55455 at 1600 by **Norman Thompson** in Oadby; Africa No.1, Gabon 15.475 (Fr to W.Africa 1600-1900) 35453 at 1632 in Woking; WYFR via Okeechobee, USA 15.566 (Eng to Europe 1600-1855) 43323 at 1745 in Truro; HCJB Quito 15.540 (Eng to Europe 1700-2000) 45444 at 1827 in Ross-on-Wye; RAE Buenos Aires, Argentina 15.345 (Sp, Eng, It, Fr, Ger to Europe, Africa 1800-2300) 24212 at 1900 in Newry; RNB Brazil 15.265 (Eng, Ger to Europe 1800-2020) 25443 at 1939 in Storrington; R.Nederlands via Bonaire 15.315 (Eng to S/E/W.Africa 1830-2025) 44444 at 1950 in Oxted.

Noted in the **13MHz (22m)** band during the morning were SRI via Sottens? 13.685 (It, Eng, Fr, Ger, Port to Australia, S.Pacific 0830-1100) 55555 at 0905 in Newry; R.Australia via Darwin on 13.605

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	A,C,I,L
585	R.Solway	B	2.00	B,C
603	Boss 603,Cheltenham	I	0.10	C,I,L
603	InvictaSG,Litt'borne	I	0.10	A,C,I
630	R.Bedfordshire(3CR)	B	0.20	A,C,E,F,G,I,L
630	R.Cornwall	B	2.00	B,C,I,K*
657	R.Clwyd	B	2.00	C,E,I,K
657	R.Cornwall	B	0.50	B,C,I
666	Gemini AM, Exeter	I	0.34	C,E,I
666	R.York	B	0.80	B,C
729	BBC Essex	B	0.20	A,C,I,L
738	Hereford/Worcester	B	0.037	C,E,F,I,L
756	R.Cumbria	B	1.00	B,C
756	R.Maldwyn, Powys	I	0.63	C,I
765	BBC Essex	B	0.50	A,C,F*,I,L
774	R.Kent	B	0.70	A,C,F,I
774	R.Leeds	B	0.50	B,C
774	3 Counties SG, Glos	I	0.14	C,I,L
792	Chiltern SG,Bedford	I	0.27	A,C,G,I,K,L
792	R.Foyle	B	1.00	C
801	R.Devon & Dorset	B	2.00	B,C,E,G,I,K
828	Chiltern SG, Luton	I	0.20	A,C,L
828	Magic 828, Leeds	I	0.12	C
828	R.WM	B	0.20	C
828	2CR CG, Bournemouth	I	0.27	C,I,L
837	R.Cumbria/Furness	B	1.50	C
837	R.Leicester	B	0.45	C,F,I,L
855	R.Devon & Dorset	B	1.00	C,I
855	R.Lancashire	B	1.50	B,C
855	R.Norfolk	B	1.50	A,C,F,I,L
855	Sunshine 855,Ludlow	I	0.15	A*,C,E
873	R.Norfolk	B	0.30	A,C,F,I,L
936	Brunel CG, W.Wilts	I	0.18	C,I
945	Derby (Gem AM)	I	0.20	A,B*,C,I,L
954	Gemini AM, Torquay	I	0.32	C,I
954	Wyvern, Hereford	I	0.16	C
963	Viva, Southall	I	1.00	A,C,I,L
990	R.Aberdeen	B	1.00	C
990	R.Devon & Dorset	B	1.00	C,I,K
990	Gt.Yks G, Doncaster	I	0.25	C
990	WABC, Wolverhampton	I	0.09	C,L
999	Gem AM, Nottingham	I	0.25	A,C,L
999	Red Rose G, Preston	I	0.80	B,C
999	R.Solent	B	1.00	A,C,F,I
1017	WABC, Shrewsbury	I	0.70	C,I,L
1026	R.Cambridgeshire	B	0.50	A,C,F,G,L
1026	Downtown, Belfast	I	1.70	B,C,K
1026	R.Jersey	B	1.00	C,I
1035	Country 1035,London	I	1.00	A,C,D*,H*,I
1035	R.Sheffield	B	1.00	C,L
1035	N.Sound, Aberdeen	I	0.78	C,H,J
1035	W.Sound, Ayr	I	0.32	C
1107	Moray Fth,Inverness	I	1.50	B*,C,H
1116	R.Derby	B	1.20	C,F,L
1116	R.Guernsey	B	0.50	A,C,F,G,I
1152	Amber, Norwich	I	0.83	A,C*,H*
1152	Clyde 2, Glasgow	I	3.06	C*,H,K
1152	GNR, Newcastle	I	1.80	C
1152	Lon.Newstalk,London	I	23.50	A,C*,I
1152	Pic'ly G,Manchester	I	1.50	B,C
1152	PlymSnd AM,Plymouth	I	0.32	C
1152	Xtra-AM, Birmingham	I	3.00	C,L
1161	R.Bedfordshire(3CR)	B	0.10	F,L
1161	Brunel CG, Swindon	I	0.16	C,I
1161	Gt.Yks, Hull	I	0.35	C
1161	Southern Counties R	B	1.00	A,C*,F,I
1161	Tay AM, Dundee	I	1.40	A*,C*,H
1170	Amber SGR, Ipswich	I	0.28	A,C*,H*
1170	GNR, Stockton	I	0.32	A,C*,H
1170	SCR, Portsmouth	I	0.12	C*,G,I
1170	Signal G,Stoke-on-T	I	0.20	C,H*,L
1170	Swansea Snd,Swansea	I	0.58	B,C,H*
1170	1170AM,High Wycombe	I	0.25	C*
1242	InvictaSG,Maidstone	I	0.32	A,C,G
1242	IoW Radio, Wootton	I	0.50	C,I
1251	Amber SGR,Bury StEd	I	0.76	A,C*
1260	Brunel CG, Bristol	I	1.60	A,C,I
1260	Marcher G, Wrexham	I	0.64	C
1260	SabrasSnd,Leicester	I	0.29	C*,L
1278	Gt.Yks G, Bradford	I	0.43	C
1296	Radio XL,Birmingham	I	5.00	C,I,L
1305	Gt.Yks G, Barnsley	I	0.15	B,C,L
1305	Premier via ?	I	0.50	A,C*,G*,H*,I
1305	Touch AM, Newport	I	0.20	C,I
1323	S.Coast R, Brighton	I	0.50	A,H*,I
1332	Premier, Battersea	I	1.00	A,C*,H*,I
1332	WGMS CG, Peterboro'	I	0.60	A,B,C,L
1332	Wiltshire Sound	B	0.30	C,I
1359	BreezeAM,Chelmsford	I	0.28	A,F*
1359	Mercia CG, Coventry	I	0.27	C,L
1359	R.Solent	B	0.85	C,I
1359	Touch AM, Cardiff	I	0.20	C
1368	R.Lincolnshire	B	2.00	C,F,L
1368	Southern Counties R	B	0.50	A,C,F,I
1368	Wiltshire Sound	B	0.10	C,I
1413	Premier via ?	I	0.50	A,C*,D*,G*,H*,I,K,L*
1431	Breeze AM, Southend	I	0.35	A,C*,G*
1431	210 CG, Reading	I	0.14	C*,I
1449	R.Peterboro/Cambs	B	0.15	A,C*,I,L
1458	R.Cumbria	B	0.50	B,C,H
1458	R.Devon & Dorset	B	2.00	C*,I,H
1458	Fortune, Manchester	I	5.00	C,K
1458	R.Newcastle	B	2.00	C,H
1458	Sunrise, London	I	50.00	A,C*,D*,E,H*,I,L
1458	Radio WM	B	5.00	C*,E
1476	CountySnd,Guildford	I	0.50	A,B*,C*,H*,I,J*,L*
1485	R.Humberside (Hull)	B	1.00	C*,F*,H,L
1485	R.Merseyside	B	1.20	C*
1485	Southern Counties R	B	1.00	A,C*,F,I
1503	R.Stoke-on-Trent	B	1.00	A*,B,C*,F*,H,I,K,L
1521	MercuryXtra,Reigate	I	0.64	A,C*,H*,I,J*,L*
1530	R.Essex	B	0.15	A,C*,F*,I
1530	Gt.Yks G,Huddersf'd	I	0.74	B,C*,H
1530	Wyvern, Worcester	I	0.52	C,E,I,L
1548	R.Bristol	B	5.00	C,I
1548	Capital G, London	I	97.50	A,C*,I,L
1548	City G, Liverpool	I	4.40	B,C*
1548	Gt.Yks G, Sheffield	I	0.74	C
1548	Max AM, Edinburgh	I	2.20	C*,H
1557	R.Lancashire	B	0.25	C
1557	Mellow, Clacton	I	0.125	A,C*
1557	Northants SG	I	0.76	C*,H*,L
1557	Sth Coast R, So'ton	I	0.50	C*,I
1584	KCBC, Kettering	I	0.04	C*,H*,L
1584	London Turkish R	I	?	A,C*,H*,I
1584	R.Nottingham	B	1.00	C*,F*,L
1584	R.Shropshire	B	0.50	B,C,F,I
1584	Tay, Perth	I	0.21	C*,H
1602	R.Kent	B	0.25	A,C*,F,I,L*

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

Listeners:-
(A) Paul Bowery, Burnham-on-Crouch.
(B) Robert Connolly, Kilkeel.
(C) Gerry Haynes, while in Talgarth, Powys.
(D) Francis Hearne, while in S.W.London.
(E) Simon Hockenhull, E.Bristol.
(F) Sheila Hughes, Morden.
(G) Rhoderick Illman, Oxted.
(H) Ross Lockley, Stirling.
(I) George Millmore, Wootton, IoW.
(J) Roy Patrick, Derby.
(K) Tom Smyth, Co.Fermanagh.
(L) Andrew Stokes, Leicester.

Transatlantic DX Chart

Freq kHz	Station	Location (UTC)	Time	DXer
		USA		
660	WFAN	New York, NY	0231	A,C,F
770	WABC	New York, NY	0000	D
850	WEEI	Boston, MA	?	C
880	WCBS	New York, NY	0033	C,D
1010	WINS	New York, NY	0205	B,C
1030	WBZ	Boston, MA	0050	D
1080	WTIC	Hartford, CON	?	C
1100	WWWE	Cleveland, OH	0830	H
1130	WBBR	New York	0130	C,G,H
1500	WTOP	Washington, D.C.	0035	A,B,C,D,G,H
1510	WNRB	Boston, MA	0045	A,C,E,G,H
1520	WWKB	Buffalo, NY	0845	E,H
1540	WPTR	Albany, NY	0000	E
1560	WQEW	New York	0117	A,C,D
		CANADA		
560	CHVO	Carbonear, NF	0803	D
580	CJFX	Antigonish, NS	0820	H
590	VOCM	St.John's, NF	0650	C,D,F,H
620	CKCM	Grand Falls, NF	0115	B
820	CHAM	Hamilton, ON	0055	B
850	CKVL	Montreal, PQ	0013	D
920	CJCH	Halifax, NS	0600	C,H
930	CJYQ	St.John's, NF	2332	A,B,C,D,E,G,H
940	CBM	Montreal, PQ	0033	A,C,D
950	CHER	Sydney, NS	?	C
1010	CFRB	Toronto, ON	2345	D
1210	VOAR	Mount Pearl, NF	?	C

DXers:-
(A) Paul Bowery, Burnham-on-Crouch.
(B) Robert Connolly, Kilkeel.
(C) Eric Duncan, St Andrews.
(D) David Edwardson, Wallsend.
(E) Roy Patrick, Derby.
(F) Richard Reynolds, Guildford.
(G) Harry Richards, Barton-on-Humber.
(H) John Slater, Scalloway.

(Eng, Chin to Asia 0900-1200) SIO211 at 1023 by **Philip Rambaut** in Macclesfield; Croatian R, Zargreb 13.830 (Cr, Eng to Europe 24hrs) 44444 at 1130 in Kilkeel; R.Austria Int via Moosbrunn 13.730 (Ger, Eng, Fr, Sp to Europe 0400-1800) 55444 at 1133 in Middlesbrough; Voice of Russia 13.785 (Eng WS) 44433 at 1150 in Herstmonceux.

Later, ISBS Reykjavik 13.860 (Ic [u.s.b.+ p.c] to Europe 1215-1300) 54444 at 1215 in Norwich; R.Nederlands via Flevo 13.700 (Eng to S.Asia, M.East 1330-1525) 33233 at 1410 in Truro; WWCR Nashville, USA 13.845 (Eng to E.USA 1400-0100) 54444 at 1600 in Penmaenmawr; WEWN Birmingham, USA 13.615 (Eng to N.America 1600-1800?) 45444 at 1642 in Woking; WHRI South Bend, USA 13.760 (Eng to E.USA, Europe 1500-2200) 35333 at 1755 in Bridgwater; VOA via Selebi-Phikwe, Botswana 13.710 (Eng to Africa 1630-1900) 15241 at 1845 in Chester; WEWN Birmingham, USA 13.695 (Eng to Europe 1800-2000) 34333 at 1920 by **Peter Pollard** in Rugby; RCI via Sackville 13.650 (Eng to Europe, M.East, Africa 2100-2230?) 25232 at 2139 in Bushey Heath; also RCI via Sackville 13.690 (Eng to Europe, M.East, Africa 2100-2230?) 35333 at 2138 in Bushey Heath.

There is much to interest the listener in the **11MHz (25m)** band. Good reception from some stations in Brazil was noted at the unusual time of 0900-0945 by **John Stevens** in Largs. They include R.Nac da Amazonia 11.780 (Port 0900-0200); R.Globo, Rio de Janeiro 11.805 (Port 0900-0330); R.Brasil Central, Goiania 11.815 (Port 0700-0300); also R.Bandeirantes, Sao Paulo 11.925 (Port 24hrs). Also received during the early morning were the BBC via Masirah Is 11.760 (Eng to M.East 0300-0915) rated SIO432 at 0348 in Woking; Slovak R.Int, via Velke Kostolany 11.990 (Eng to Australia 0830-0857) SIO444 at 0854 by **Francis Hearne** in N.Bristol; KTWR (TWR) Agana, Guam 11.665 (Chin to China 0900-1200) SIO222 at 0953 in Macclesfield.

During the afternoon, WYFR via VOFC Taipei, Taiwan 11.550 Eng to India 1302-1502) was 22222 at 1320 in Rugby; Polish R, Warsaw 11.815 (Eng to Europe 1300-1355) 54444 at 1330 in Ross-on-Wye; Voice of Vietnam, Hanoi 12.020 (Eng to F.East 1330-1400) 35233 at 1330 in Newry; Voice of the Mediterranean via Cyclops, Malta 11.925 (Eng, Ar to N.Africa 1400-1600) 54544 at 1425 in Herstmonceux; R.Australia via Carnarvon 11.660 (Eng to S.Asia 1430-1800) SIO344 at 1430 in Edinburgh and 45444 at 1607 in Freshwater Bay; R.Jordan via Al Karanah 11.970 (Eng 1500-1730) 54544 at 1530 in Galashiels; Vatican R, Italy 11.640 (Eng to Asia 1600-1620) 44444 at 1600 in Morden; RCI via Skelton, UK 11.935 (Eng, Fr to Europe, Africa 1400-1600) 34323 at 1600 in Oadby; R.Pakistan, Islamabad 11.570 (Eng to M.East 1600-1630) 34232 at 1622 in Bridgwater; RFI via ? 11.700 (Eng to Africa 1600-1700) 44444 at 1625 in Norwich.

Later, the BBC via Kranji, Singapore 11.750 (Eng to Far East 1100-1800) was 33333 at 1712 in Burnham-on-Crouch; BBC via Skelton, UK 12.095 (Eng to Europe, N/W.Africa 0400-2215) 54444 at 1745 in Penmaenmawr; R.Kuwait via Kabd 11.990 (Eng to Europe, N.America 1800-2100) 55555 at 1815 in Felixstowe; R.Nac da Amazonia, Brazil 11.780 (Port 0900-0200) 44534 at 2005 in Guildford; BBC via Ascension Is 11.835 (Eng to Africa 1930-2100) 44444 at 2040 in Stalbridge; R.Havana Cuba 11.705 (Eng to Europe 2100-2200) 33333 at 2100 in Appleby; R.Bandeirantes, Sao Paulo, Brazil 11.925 (Port 24hrs) 25542 at 2100 in Wallsend; R.Japan via Moyabi, Gabon 11.865 (Eng to Europe 2100-2200) 55544 at 2142 in Bushey Heath; AIR via Bangalore 11.620 (Eng, Hi to Europe 1745-2230) 25332 at 2220 in Chester.

R.New Zealand Int has been reaching the UK quite well in the **9MHz (31m)** band! Their broadcast to Pacific areas on 9.700 (Eng 0715-1206) was rated 35434 at 0850 in Middlesbrough; SIO433 at 0932 in N.Bristol; SIO233 at 1000 in Edinburgh; 22432 at 1020 in Galashiels; 22332 at 1120 in Kilkeel. R.Australia was noted on 9.580 from Shepparton (Eng to Pacific 0630-1600?) 43443 at 0829 in Bushey Heath; 9.510 from Shepparton (Eng to Asia 0730-0900) 34333 at 0840 in Rugby; 9.560 from Carnarvon (Eng to Pacific 1200-1430) 22222 at 1200 in Newry; 9.615 from Darwin (Eng to Asia 1100-1755) SIO333 at 1449 in Gt.Yarmouth. In Cyprus, 9.615 was 35553 at 1305.

Also heard during daylight were R.Vlaanderen Int, Belgium 9.925 (Eng to Europe 0730-0755) was 33333 at 0745 in Norwich; AWR (KSDA) Agat,

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	1736	F,G,H,I
2.325	ABC Tennant Creek	Australia	1738	F,G,H
2.485	ABC Katherine	Australia	1740	H
2.850	KCBS Pyongyang	N.Korea	2205	F,G
3.215	RRI Manado	Indonesia	1615	F
3.220	CPBS 1, Beijing	China	2142	F,M
3.220	KCBS Wonsan	N.Korea	1537	G
3.220	R.Kara, Lome	Togo	1936	C,H,L,M,R
3.223	AIR Simla	India	1535	F,H
3.230	SABC Meyerton	S.Africa	2000	A,C,L
3.240	TWR Shona	Swaziland	1821	H,L
3.245	AIR Lucknow	India	1533	F,G,H,U
3.250	R.Pyongyang	N.Korea	1608	G,H
3.255	BBC via Maseru	Lesotho	1925	C,H,L,R
3.260	Guizhou 1	China	2200	F,G
3.270	SWABC 1, Namibia	S.W.Africa	1938	A,C,H,M,R,U
3.290	SWABC 2, Namibia	S.W.Africa	2008	C,H,L,R,U
3.300	R.Cultural	Guatemala	0045	C,F,L
3.306	ZBC Prog 2	Zimbabwe	2123	A,C,H,L,M,R
3.315	AIR Bhopal	India	1730	F,G,H,L,M,U
3.316	SLBS Goderich	Sierra Leone	2122	H,M,U
3.320	R.France Int. via ?	France?	1931	H
3.320	Pyongyang	N.Korea	1611	F,G,H
3.320	SABC Meyerton	S Africa	2130	A,C,H,M,O,R
3.325	FRCN Lagos	Nigeria	2121	L,M,R
3.335	TWR	Swaziland	1950	C
3.335	CBS Taipei	Taiwan	2144	F,G,H,M,N,R
3.345	AIR Jaipur	India	0102	L
3.345	AIR Jammu	India	1718	F,G,H,M,R,U
3.345	Channel Africa	S.Africa	1921	H
3.356	R.Botswana	Gabarone	1921	C,H,R
3.365	GBC R-2	Ghana	2144	A,C,L,M,P,Q,R,U
3.365	AIR Delhi	India	1616	G,H
3.370	R.Tezulutlan	Guatemala	0010	C
3.375	R.Nacional S.Gabriel	Brazil	0015	C
3.377	R.Nacional, Mulenvos	Angola	0020	C
3.380	NBC Blantyre	Malawi	1739	H,L
3.815	Taiwan 1 Sc, Beijing	China	2135	F
3.905	RRI Banda Aceh	Indonesia	1605	F
3.915	BBC via Kranji	Singapore	1700	D,E,G,H,L,R
3.925	NSB (R.Tampa)	Japan	1200	S
3.930	Nei Menggu-Mo,Hohhot	China	2210	F
3.930	KBS Seoul	Korea	2210	F
3.940	PBS Hubei Wuhan	China	2200	F
3.945	AIR Gorakhpur	India	1514	H
3.950	Qinghai PBS, Xining	China	2355	C,F
3.955	BBC via Skelton	England	2000	C,E,L,Q,V,W
3.960	Xinjiang PBS, Urumqi	China	1540	F,G
3.960	R.Budapest	Hungary	1645	Q
3.965	RFI Paris	France	0030	C,D,L,Q,W
3.970	R.Korea via Skelton?	England	2130	L,S
3.975	R.Budapest	Hungary	2005	C,J,K,L,P,Q,W
3.975	RRI Surabaya	Indonesia	1600	F,R
3.980	VOA via Munich	Germany	2156	W
3.985	IRRS	Italy	2058	L
3.985	China R via SRI	Switzerland	2100	C,L,P,T,V,W
3.990	Xinjiang BS, Urumqi	China	1428	C,F,H
3.995	DW via Julich	Germany	2157	C,D,E,L,W
4.003	RRI Padang	Indonesia	1555	F
4.035	Xizang PBS, Lhasa	Tibet	1346	F,H,K
4.081	Ulan Batar 1	Mongolia	1540	F
4.330	Xinjiang BS, Urumqi	China	1545	F,G,H
4.450	R.Frontera, Cobija	Bolivia	2325	F
4.460	CPBS 1, Beijing	China	2115	E,F
4.470	R.Movima	Bolivia	2305	F
4.500	Xinjiang BS, Urumqi	China	1641	F,G,H
4.549	R. Dif.Tropico	Bolivia	2315	F
4.600	R.Perla del Acre	Bolivia	0255	F
4.650	R.Santa Ana	Bolivia	2315	F
4.735	Xinjiang, Urumqi	China	1429	C,F,G,H,R,U
4.747	R.Huanta 2000	Peru	2335	F
4.750	R.Bertoura	Cameroon	2153	R
4.750	Xizang BS, Lhasa	Tibet	1357	C,E,F,H,W
4.753	RRI Ujung, Padang	Indonesia	2105	F
4.755	R.Educ CP Grande	Brazil	0010	C,F
4.760	Yunnan PBS,Kunming	China	1550	A,C,F,H,R,U
4.760	AIR Port Blair	India	1519	C,F,H
4.760	ELWA Monrovia	Liberia	2038	H,P,R,U
4.760	TWR Manzini	Swaziland	0316	L
4.765	R.Integracao	Brazil	0015	C
4.765	R.Rural, Santarem	Brazil	2145	F
4.765	RRI Medan	Indonesia	1510	F
4.770	Centinela del Sur	Ecuador	0040	C
4.770	FRCN Kaduna	Nigeria	1951	A,C,G,L,M,R,U
4.775	AIR Guwahati	India	0130	C,F,H,U
4.775	R.Tarma	Peru	0305	F
4.783	RTM Bamako	Mali	2150	A,C,L,M,R,U
4.790	Azad Kashmir R	Pakistan	1441	F,H,R,U
4.790	R.Atlantida	Peru	2255	F
4.800	R.Nac Amazonas	Brazil	0000	A
4.800	CPBS 2 Beijing	China	1328	E,H,R,U
4.800	AIR Hyderabad	India	1523	F,H
4.800	LNBS Lesotho	Maseru	2042	C,H,L,R,U
4.805	R.Nac.Amazonas	Brazil	2205	C,F,R
4.815	R.Difusora, Londrina	Brazil	0025	C
4.815	R.diff TV Burkina	Ouagadougou	2134	A,C,M,R,U,W
4.815	R.Pakistan Karachi	Pakistan	1720	K
4.820	La Voz Evangelica	Honduras	2331	W
4.820	AIR Calcutta	India	1525	C,F,H
4.820	Xizang, Lhasa	Tibet	2350	E,F
4.825	R.Cancao Nova	Brazil	1616	E,R
4.828	ZBC R-4	Zimbabwe	1907	H,M,R,U
4.830	R.Botswana, Gaborone	Botswana	2136	C,H,L,M,R
4.830	China Huayi BC	China	1717	R
4.830	R.Tachira	Venezuela	0025	A,C,F,G,L,R
4.832	R.Reloj	Costa Rica	0815	F,G,U
4.834	R.Maranon, Jaen	Peru	2317	E
4.835	ABC-Alice Springs	Australia	0025	C
4.835	R.Tezulutlan, Coban	Guatemala	032	F
4.835	RTM Bamako	Mali	2010	A,C,G,K,L,R,U,W
4.840	Heilongjiang, Harbin	China	2130	F
4.840	AIR Bombay	India	1527	C,E,F,H,O,R,U
4.840	R.Andahuaylas	Peru	2300	F
4.845	RTM Kuala Lumpur	Malaysia	1437	F,H
4.845	ORTM Nouakchott	Mauritania	2006	A,C,L,M,R,U,W
4.850	AIR Kohima	India	0030	C,E,L
4.860	AIR Kingsway(Feeder)	India	1855	C,H,M,O,R,U
4.865	PBS Lanzhou	China	1438	A,B,C,F,G,H, K,O,R,W
4.870	R.Cotonou	Benin	1945	A,C,K,M,R,U
4.875	R.La Cruz del Sur	Bolivia	0255	F
4.879	R.Bangladesh	Bangladesh	1556	C,F,H
4.880	AIR Lucknow	India	0030	C
4.885	R.Clube do Para	Brazil	2155	A,E,F
4.885	KBC East Sce Nairobi	Kenya	2046	A,M,R,U
4.890	R.Port Moresby	New Guinea	1940	F,G,
4.890	ORTS Dakar	Senegal	0500	U
4.895	R.IPB AM C'po Grande	Brazil	0633	R
4.895	Voz del Rio Arauca	Colombia	0030	A,C
4.895	AIR Kurseong	India	1453	H
4.895	Pakistan BC	Pakistan	1734	F,H,R,U
4.900	V. of the Strait 2	China	1535	F,G,H,K,R,U
4.900	SLBC Colombo	Sri Lanka	1626	C,F,H,M
4.905	R.Relogio, Rio	Brazil	2130	F
4.905	R.Nat.N'djamena	Chad	2140	A,K,L,M,R,U,W
4.905	CPBS 1, Beijing	China	2125	E,F
4.910	RTG Conakry	Guinea	2000	Q
4.910	RRI Bukittinggi	Indonesia	1600	F
4.910	R.Zambia, Lusaka	Zambia	1949	R
4.915	PBS Guangxi, Nanning	China	1535	F,K
4.915	GBC-1, Accra	Ghana	2145	A,C,K,M,R,U,W
4.915	R.Cora, Lima	Peru	0755	U
4.920	R.Quito	Ecuador	0800	F,G,L,R,U
4.920	AIR Madras	India	1642	C,F,H,M,R,U
4.925	R.S.Miguel,Riberalta	Bolivia	2250	F,R
4.927	RRI Jambi	Indonesia	1630	F
4.931	R.Internacional	Honduras	0005	F
4.935	KBC Gen Sce Nairobi	Kenya	1910	C,M,R,U
4.940	V of Strait, Fuzhou	China	1505	F
4.940	AIR Guwahati	India	1724	C,H
4.945	R.Illimani, La Paz	Bolivia	2230	F
4.950	R.Nacional, Mulenvos	Angola	1813	H,R,U
4.950	AIR Jammu	India	1528	H
4.955	R.Nac. de Colombia	Colombia	2330	A,C,F,W
4.960	Hanoi 2	Vietnam	1430	H
4.965	R.Alvorada	Brazil	2152	E
4.965	Christian Voice	Zambia	2045	C,H,M,R,U
4.970	PBS Xinjiang	China	1631	F,G,H,R,U
4.970	R.Rumbos, Caracas	Venezuela	0025	C
4.975	R.Uganda, Kampala	Uganda	2020	A,L,M,R,U
4.980	PBS Xinjiang, Urumqi	China	1417	C,F,H,R
4.980	Ecos del Torbes	Venezuela	2209	A,C,F,G,L,M,R,W
4.985	R.Brazil Central	Brazil	0700	B,C,F,R,U
4.990	Hunan 1, Changsha	China	1440	F,H
4.990	AIR Ext.Service	India	0025	C,L
4.990	FRCN Lagos	Nigeria	1928	A,U
4.995	R.Andina, Huancayo	Peru	2240	F
5.005	R.Nacional, Bata	Eq.Guinea	2209	A,H,M,R,U
5.005	R.Nepal, Kathmandu	Nepal	1447	C,F,H
5.009	R.TV Malagasy	Madagascar	1751	H
5.010	R.Garoua	Cameroon	2025	C,R
5.010	Guangxi 2, Nanning	China	2305	F
5.010	AIR Thiru'puram	India	0025	C,F,U
5.015	EP do Namibe	Angola	2336	W
5.020	PBS-Jiangxi Nanchang	China	1445	C,E,F,H,R
5.020	Ecos del Atrato	Colombia	0315	F
5.020	Voz del Upano, Macas	Ecuador	2015	E
5.020	La V du Sahel,Niamey	Niger	2055	A,C,E,H,M,R,U,W
5.025	R.Parakou	Benin	2212	A,B,C,M,R,U
5.025	R.Rebelde, Habana	Cuba	0055	C,F
5.025	R.Uganda, Kampala	Uganda	1935	U
5.030	AWR Latin America	Costa Rica	2315	C,F,R
5.035	R.Bangui	C.Africa	2100	A,C,R,U
5.040	PBS Fujian, Fuzhou	China	1450	F
5.040	L.V. de Yopal	Colombia	0050	C
5.040	Voz del Upano, Macas	Ecuador	0006	E
5.045	R.Cultura do Para	Brazil	0020	C,L
5.047	R.Togo, Lome	Togo	2140	A,B,C,E,L, M,Q,R,U,W
5.050	GFBC Nanning	China	2209	E,H,M,U
5.050	Voice of the Strait	China	1550	F,R
5.050	AIR Aizawl	India	0050	C
5.050	R.Tanzania	Tanzania	1943	B,L,M,Q,R,U
5.055	Faro del Caribe	Costa Rica	1632	E
5.055	RFO Cayenne(Matoury)	French Guiana	0820	C,F,U
5.060	PBS Xinjiang, Urumqi	China	1640	C,E,H,R,U
5.065	R.Candip, Bunia	Zaire	1801	H,W
5.075	Caracol Bogata	Colombia	2240	A,B,C,K,L,Q,R,U,W
5.083	R.Mundo, Cusco	Peru	2230	F
5.090	Taiwan 2 Sce,Beijing	China	1442	F,H
5.125	Taiwan 1 Sce,Beijing	China	2135	F
5.131	R.Vis.2000 B'bamarca	Peru	2235	F
5.163	CPBS 2, Beijing	China	1450	F

DXers:-

(A) Darren Beasley, Bridgwater.
(B) Paul Bowery, Burnham-on-Crouch.
(C) Robert Connolly, Kilkeel.
(D) Bernard Curtis, Stalbridge.
(E) John Eaton, Woking.
(F) Jim Rdwards, Bryn.
(G) David Edwardson, Wallsend
(H) P.Gordon Smith, Kingston, Moray.
(I) Tony Hall, Freshwater Bay, IoW.
(J) Simon Hockenhull, E.Bristol.
(K) Sheila Hughes, Morden.
(L) Eddie McKeown, Newry.
(M) Fred Pallant, Storrington.
(N) John Parry, Larnaca, Cyprus.
(O) Roy Patrick, Derby.
(P) Clare Pinder, while in Appleby.
(Q) Peter Pollard, Rugby.
(R) Richard Reynolds, Guildford.
(S) Alan Roberts, Quebec, Canada.
(T) Chris Shorten, Norwich.
(U) John Slater, Scalloway.
(V) Tom Smyth, Co.Fermanagh.
(W) Andrew Stokes, Leicester.

Guam 9.530 (Eng to S.E.Asia 0900-1000) 54444 at 0952 in Burnham-on-Crouch; AWR (KSDA) Guam 9.370 (Chin, Eng to Asia 1000-1500) 35433 at 1055 in Bridgwater; KHBN, Palau 9.965 (Fil, Eng, Hin, Ur to Asia [Eng ident 1100]) 35433 at 1100 in Chester; R.Norway Int, Oslo 9.590 (Norw [Eng Sun] to Europe 1300-1330) was noted as SIO222 at 1300 by **Tom Smyth** in Co.Fermanagh; Voice of Turkey, Ankara 9.445 (Eng to Europe, USA 1330-1430) 45333 at 1348 in Ross-on-Wye; RCI via Skelton, UK 9.555 (Eng to Europe, Africa 1430-1500) 33333 at 1454 in Manchester; AIR via Aligarh? 9.910 (Eng to S.E.Asia 1530-1545) 43432 at 1535 in Herstmonceux.

After dark, R.Tirana, Albania 9.740 (Eng to Europe 1930-2000) was 43333 at 1940 in Scalloway; R.Nederlands via Madagascar 9.605 (Eng to S/E/W.Africa 1730-1930, E/C/W.Africa 1930-2025) 42332 at 1950 in Oxted; R.Bulgaria, Sofia 9.700 (Eng to Europe 2000-2100) 33333 at 2000 in Stalbridge; Voice of Indonesia 9.525 (Eng 2000-2100?) 43233 at 2020 in Truro; R.Cairo via Abis 9.900 (Eng to Europe 2115-2245) 44444 at 2130 in Appleby; R.Cancao Nova, Brazil 9.675 (Port 24hrs) 45454 at 2141 in Woking; AIR via Delhi? 9.910 (Eng to Pacific areas 2045-2230) 33232 at 2200 in Oadby; AWR Alajuela, Costa Rica 9.725 (Eng to C/S.America 2300-0100) 33222 at 2320 in Morden; R.Nac del Paraguay 9.735 (Sp 0800-0400) 35543 at 2325 in Wallsend; Voice of Turkey, Ankara 9.445 (Eng to USA 2300-0000) 44444 at 2330 in Penmaenmawr; R.Rumbos, Caracus, Venezuela 9.660 (Sp 24hrs) 25533 at 2342 in Guildford.

The occupants of the **7MHz (41m)** band include R.Diff TV Congolaise via Brazzaville 7.105 (Fr 0600?-1100) rated 45544 at 0647 in Burnham-on-Crouch; KTBN via Salt Lake City 7.510 (Eng to N.America 0000-1600) 21331 at 0750 in Chester; WJCR Upton, USA 7.490 (Eng to E.USA 24hrs) 34333 at 0820 in Scalloway; RFPI Costa Rica 7.385 (Eng 24hrs) 44434 at 0833 in Rugby; R.Australia via Carnarvon 7.240 (Eng to Asia 0900-1200) 24331 at 1052 in Oxted; R.Thailand via Ulanthani? 7.295 (Eng to Europe 1900-2000) 53433 at 1948 in Bushey Heath; Israel R, Jerusalem 7.465 (Eng to Europe, N.America 2000-2030) SIO333 at 2000 in Co.Fermanagh; Monitor R.Int, via WSHB 7.510 (Eng to Europe, Africa 2000-0000) 23332 at 2030 in Bridgwater; AIR via Aligarh? 7.410 (Hi, Eng to Europe 1745-2230) 44444 at 2039 in Newry; WYFR via Okeechobee 7.355 (Eng to Europe, Africa 2000-2300?) 32233 at 2100 in Stalbridge; WEWN Birmingham, USA 7.425 (Eng to N.America 2000-1400) 22222 at 2305 in Kilkeel.

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