

FOR THE  
RADIO LISTENER

# short wave magazine

March 1994 £1.90 ISSN 0037 - 4261



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Airband, Scanning, Junior Listeners, SSB Utility Listening, Propagation, Amateur Bands, Long, Medium & Short Waves, Satellite TV Reports, Weather Satellites and more.

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# short wave magazine

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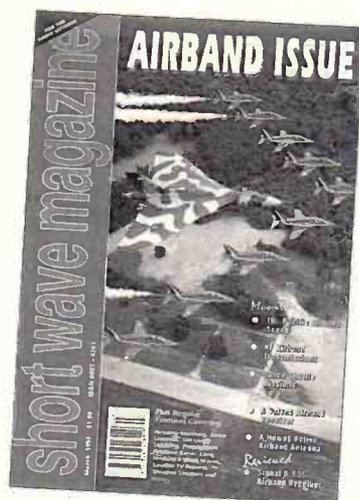
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#### Cover:

This month's cover picture illustrates our airband theme and shows the RAF's Red Arrows flying in close formation with Avro Vulcan XH558. Crown Copyright photograph by Sgt. Rick Brewell ABIPP.



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# good listening

## SWM SERVICES

### Subscriptions

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

### Components for SWM Projects

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

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

### Back Numbers and Binders

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

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 (0202) 659930. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Poole (0202) 659950.

# editorial



*Dick Ganderton*  
G8VFF

In a couple of the regular columns this month you will find the columnist mentioning some errors that have crept into their columns recently. All the columns have an avid following and most of the columnists are continually asking me to give them more space. For various reasons - the need to try to keep a balanced issue and the costs involved in producing a viable magazine are two that spring to mind - this is not possible.

The columnists do a marvellous job in collating your views and compiling a monthly column to strict deadlines. The columns are as up-to-date as modern technology will allow, so it is no good expecting to see reports from readers that are only a few days old when the magazine goes on sale - it takes almost two weeks to print and distribute, let alone put it together!

It is also unreasonable to expect the Editorial Staff to be conversant with every technical term used in each subject covered. So, for example, when a columnist's spell checker runs amok and creates what appear to be sensible, if unusual, technical terms, you will need to bear with us. We try to get corrections into the next available issue.

Occasionally, a columnist mentions a group or useful contact and omits to give the address. When this happens we usually try to add the information from our records. Some groups, however, seem to think that we are not worthy of being kept informed of changes in contact names and addresses. If your group falls into this category, please add *Short Wave Magazine* to your regular mailing list.

Dick Ganderton G8VFF

## letters

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

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

Dear Sir

I am a scanner and s.w. enthusiast and have noticed an increase in the use of c.t.s.s. on a lot of frequencies, and I wondered if I could get hold of a circuit drawing for a variable frequency c.t.s.s. decoder or could you possibly do an article on the subject?

Also, a humorous tale to amuse your readers and quite true. I think that this story may be very familiar to s.w. listeners who have a shack in the garden, that is the continual chirping of birds in the trees. Only my birds are getting very good at emulating short Morse stations callsigns for instance GKTW62, which to a starling or sparrow might be

mistaken as a love call from a female sparrow.

I often wondered why I kept hearing this callsign even when the rig is switched off. When the c.w. is on, the shack roof becomes the local bird international airport.

Steve Caw  
Warwick

*An interesting letter from Mr Caw (real name!). I have heard starlings imitating electronic telephone "warbles", but this one is new. I wonder if it could pass the Morse test. Just an idea - perhaps you could train a parrot to make those repetitive CQ calls needed when contest operating! - Ed*

Dear Sir

Re: SWM Jan 1994, Single Transistor Reflex. I wanted to construct this, and wrote to Maplin for the parts. They tell me they do not stock BF254 and do not have a suitable equivalent. Neither do Cirkit.

Can anyone please let me know where this transistor can be obtained or an equivalent which is stocked by the main suppliers.

Thank you.

W. Caley  
London

*Sorry! - we should have checked! We don't know of a stockist for the BF254, but we believe a BF494 (stocked by Maplin - order number: QQ19V) will work in this circuit. - Ed*

Dear Sir

With reference to the article in SWM, Jan 94, project, Building The Acorn 1, R. A. Wilson, page 24. He states that PM Components of Gravesend can supply the valve type 955 at a very modest cost. This same company quoted me £4.50 for the 955 and £2.50 P&P plus 17.5% VAT, total, £8.23.

Langrex Supplies in Croydon, quoted me for the same valve, £3.50 plus £1.00 P&P plus 17.5% VAT, total, £5.29, a saving of £2.94. It pays to shop around!

A. Dippie  
Northumberland

Dear Sir

In the December 1993 and January 1994 issue of SWM, there were articles on restoration of an R1155a aircraft radio by Mr Miller.

I also have an R1155 which I would like to work on, starting off with a power pack of which I would like to know more about. I need a circuit diagram and information as to where I can obtain components to construct one, I have quite a bit of electrical knowledge having worked in this field all my life.

Do you think that you could help by either putting me in contact with Mr Miller or by an article in the magazine.

Dennis Pell  
Northants

*If any reader would like to write a suitable article it will be considered for publication. - Ed*

# letters

## Dear Sir

I am writing in reply to the letter from A. Webb from Gwent regarding his musical Discone, I have had a very similar experience. My Discone is mounted on a 6 metre steel mast, fixed to the side of my house with 450mm stand-off brackets.

The first night after installation was disturbed by a constant tone (my musical wife tells me it was G-sharp). The problem was the eight rods vibrating at their natural resonance in a steady wind. This tone was transmitted, via the mast and mounting brackets, to the side of the house which in turn acted like a sounding box. The effect was similar to a tuning fork being struck and the base held against a table.

The solution is simple and inexpensive. Go down to your local fishing tackle shop and purchase a reel of 10-15lb nylon line. Tie the end of the line to the bottom of one of the downward pointing elements. Wrap the line around the mast once and move onto the next element, keeping tension on the line so that the elements are held in position, but not unduly bent.

I carried out this modification 18 months ago and although I live in a very exposed position, I have had no recurrence of the 'musical Discone'. As an additional insurance I have isolated the mast from the U-bolts on the mounting brackets, the top 70mm of an old wellington boot wrapped around the mast works fine.

There appears to be no deterioration in signal strength, and the Nylon 'stays' are not visible from the ground.

Congratulations on an excellent and informative magazine.

**S. P. Winfield**  
**Leeds**

## Dear Sir

Reference *Short Wave Magazine*, February 1994 and a letter from A. Webb, Gwent. This letter takes me back many, many years when, as a Police Officer, I was sent to investigate a 'ghost' in a dwelling house. Maybe my 6'6" height contributed to this, but I went alone.

On arrival, residents and neighbours, to say the least, were very disturbed. The resident, a newcomer to the area was said to have bought the 'haunting', a screaming 'banshee scream' reduced to a 'howl and hum'. Fortunately, it was summer time and at daylight I returned and yes, there it was, a multi-element TV aerial which howled and hummed to wind velocity and direction. I suggested elements be daubed with a bitumastic rubber solution and the mounting tube filled and sealed with (local product) 'sandust'. As a result, the 'ghost' disappeared and Police Public Relations which (in those days) were good, improved.

**Ray Williams**  
**Lincs**

*These are just two of many letters giving similar solutions. Other readers pointed out that closing the ends of support tubes also reduced 'singing'. Now if I could only stop the pigeons and sparrows roosting on the antenna system ... (I know - use an imitation owl!) - Ed*

## Dear Sir

I was pleased to read last year that Aberdeen's excellent local radio station North Sound Radio was to benefit from a new f.m. transmitter, replacing an old Granite Hill 600W installation, located at the topographically advantageous TV site at Durriss using a much increased power of 10kW, vertically polarised.

North Sound Radio was kind enough to send me details of the new site, which they hoped would be on the air at the beginning of January 1994.

I would be very interested indeed to see some reception reports from listeners around North East Scotland, and beyond, as to how the new signal from Durriss is performing.

The official new service area should, I gather, extend from Aberdeen to Peterhead, Turriff down to Ballater, Breckin, Forfar and Montrose, but I would expect reception to be possibly well beyond perhaps in Perth, Fife, Edinburgh even down the coast south of Dunbar. Their transmissions are on 96.9v.h.f./f.m.

P.S. How is the new Classic FM main station at 'Angus' performing compared to the Forfar site?  
Their frequency is 100.1MHz v.h.f./f.m. serving Tayside.

**M. Smith**  
**3 Charlecote Gardens,**  
**Streamside,**

## Dear Sir

Have any other readers had any problems with the RSGB novice course? This is my story so far.

At the beginning of June 1993, I rang the RSGB enquiring about the novice course. A few days later a letter arrived informing me to contact the Senior Instructor for my area. I left a message on his Answerphone. Two weeks later, no reply, so another message was left on his Answerphone.

A week later the Senior Instructor rang me, took a few of my details and then explained briefly about the course. He then said that he would ring me as soon as a place was available, which would be in about two months time.

Four and a half months later, a third message was left, and within a few days he rang me back, but gave no real answer as to why things were taking so long.

He did say that he passed on my details to another instructor closer to me, and he should have rung me by now. At this point, I offered to have the course run at my house if any others in the area were interested, and if it would help speed things up a little.

It has been almost seven months since my first enquiry and I'm still no nearer to starting a course. I do appreciate that it is organised and run on a purely voluntary basis, and there is no doubt there is a huge waiting list and very few instructors willing to give up their time.

But, I do think that almost seven months is a little long to wait! Especially when I was told originally that I would have to wait about two months. Have any other novices had similar experiences or am I just unlucky?

Also, has anyone, who doesn't want a 'black box' transceiver, tried to find a manufacturer who makes a kit for 430MHz?

**J. Tiney**  
**Northants**

## Dear Sir

With reference to Lee Williams letter about his Russian DX catch on 7.105MHz, I think he possibly heard Radio Dnestr International, operated by separatists in the Snestr region of Moldova, which broadcasts in English to the Americas from 03.30 to 04.00UTC Saturdays to Thursdays on 7105kHz.

The probable address for this station is 25th October Street 45, Tiraspol, Pridnestrovge, Via C.I.S.

**Tony Vaughan**  
**Hants**

## Dear Sir

I have read with interest the recent correspondence in your 'Letters' section regarding problems with computer back-up in portable communications receivers. However, I note that no reference has been made to the Sony 2001D receiver. I have regularly experienced incorrect frequency display on a.m. or complete locking up of all controls when tuning to relatively low frequencies on a.m., on switching on the set after I had driven in my car, with the receiver packed away in the boot. The problem has never occurred when using the set at home.

The only way in which I managed to restore the receiver to correct functioning was to remove the main, and back-up, batteries and leave the receiver for a while, before refitting the batteries. I did notice, however, that I could improve the recovery period by earthing an appropriate point on the printed circuit board - not the most satisfactory arrangement!

Therefore, I suspected that it could be a build-up of static, following the travelling in the car, that was causing the problem. So, for the last few times that I have used the Sony in this manner, before switching on the power switch on the side of the receiver, I have connected the external a.m. aerial socket to a suitable earth, to ensure complete discharge of any build-up of static.

To date, this problem has not reoccurred, but I would be interested to know if any other readers have experienced this problem, and have they any further thoughts and advice that they can offer your readers.

**Peter J. Kay GW4GCB**  
**Clwyd**

# 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 26:** Tyneside Amateur Radio society are holding their eighth annual rally at the Temple Park Centre, South Shields. 18,000 sq. feet of floor space, all one level, direct access to the exhibition floor, ample car parking for exhibitors and visitors, comprehensive catering and leisure facilities. Jack G0DZG on 091-265 1718.

**February 26:** The 9th Rainham Radio Rally is being held at a new and larger venue at the Rainham School for Girls, Derwent Way, Rainham, Gillingham, Kent. Junction 4 M42, well signposted. Traders, ample parking, Bring & Buy, refreshments. Admission £1, children under 16 free. Talk-in on S22. G7JBD on (0634) 365980.

**\*March 12/13:** The London Amateur Radio & Computer Show will be held at the Picketts Lock Centre, Picketts Lock Lane, Edmonton, London N9. Large trade presence, free parking, lectures and disabled facilities. Bring & Buy, special interest groups, talk-in on S22. (0923) 893929.

**\*March 20:** Norbreck Amateur Radio, Computing & Electronics Exhibition, Norbreck Castle Hotel, Queens Promenade, Blackpool, Lancashire. Extended free car parking with free shuttle service, novice licence details and demonstrations, Bring & Buy, competitions, refreshments, talk-in on S22. Doors open 11am (disabled entry with ramp from 10:45am) close 5pm. Admission £1.50, over-65s £1.00, under-14s free. Peter Denton G6CGF on 051-630 5790.

**March 20:** Tiverton South West Radio Club are holding their 1994 Mid Devon Rally at the Pannier Market, Tiverton. Doors open at 10am. Easy access, only minutes from junction 27 on the M5. Excellent free parking, two halls of trade stands, Bring & Buy stall and mobile snack bar. Further displays and full refreshment facilities in the club room bar which is open throughout the day. Talk-in on S22. G4TSW, Mid Devon Rally, PO Box 3, Tiverton, Devon.

**March 27:** Bournemouth Radio Society are holding their 7th Annual Sale at Kinson Community Centre, Pelhams Park, Milhams Road, Kinson, Bournemouth. Doors open at 10am. Talk-in from G1BRS on S22. Amateur Radio and Computer Traders, clubs and specialised groups. Admission £1 including free raffle ticket. Ian G2BDV QTHR on (0202) 866887.

**March 27:** Pontefract & DARS are holding their 14th Annual Components Fair & Spring Rally at the Carleton Community Centre, Carleton, Pontefract. Doors open at 11am, 10.30 for disabled. Bring & Buy, traders, bookstall, licensed bar and refreshments, Morse tests, tombola, traders, car boot spaces available, admission by prize programme, 3 prizes plus special draw for the ladies. G0NQE, QTHR on (0977) 677006.

## AVON

**RSGB City of Bristol Group:** last Mondays, 7pm. The Small Lecture Theatre, Queens Building, University of Bristol, University Walk, Bristol. February 28 - History of Portishead. Dave. (0272) 672124.

**Shirehampton ARC:** Fridays. March 4 - Wonderful world of weather satellites, 11th - Chat night, 18th - VHF test equipment (check your rigs emissions). Ron Ford G4GTD. (0272) 770504.

**South Bristol ARC:** Wednesdays. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. March 2 - 15m activity evening, 9th - Aviation video evening, 16th - First aid in home and resuscitation, 23rd - How about showing the club your Morse keys. For more information ring (0275) 834282 on a Wednesday evening.

## BEDFORDSHIRE

**Shefford & DARS:** Thursdays, 8pm. Church Hall, Amptill Road, Shefford, Bedfordshire. March 17 - Members activity night, 24th - Junk sale. Paul G1GSN. (0462) 700618

## DEVON

**Torbay ARS:** Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. March 5 - Annual dinner and dance, 18th - Monthly meeting. Peter G4UQD. (0803) 864528.

## ESSEX

**Vange ARS:** Thursdays 8pm, Barnstable Community Centre, Long Riding, Basildon, Essex. February 24 - AGM, March 3 - Junk sale. Doris. (0268) 552606.

## FIFE

**Dundee ARC:** Tuesdays, 7pm. College of Further Education, Graham Street, Dundee. March 1 - Lecture 'Viewing the bands - DIY panoramic reception' by Bill Wilson, Aberdeen ARS, 8th - Construction night, 15th - Lecture, 22nd - Construction night. GM4FSB, 30 Albert Crescent, Newport-on-Tay, Fife DD6 8DT.

**Dunfermline & DARC:** Thursdays, 7.30pm. The former RAF radio station, Outh Muir, located by the A823 Dunfermline to Crieff Road, one mile from the Knockhill Racing Circuit. February 24 - Construction evening - Top band DF equipment, March 3 - Ten-Tec night - A review of the Scout and other Ten-Tec rigs. Wallace Shackleton GM0GNT. (0577) 864050.

## GREATER LONDON

**Acton, Brentford & Chiswick RC:** 3rd Tuesdays, 7.30pm. Chiswick Town Hall, Heathfield Terrace, Chiswick, W4. March 15 - General awards and discussion. Colm. 081-749 9972.

**Edgware & DRS:** Thursdays, 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak. February 24 - Morse training evening, plus station on the air, March 10 - AMTOR, 24th - Morse training evening, plus station on the air. Rod Bishop. 081-204 1868.

**Wimbledon & DARS:** 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road SW19. February 25 - Desert island radio. 081-540 2180.

## HEREFORD & WORCESTER

**Bromsgrove ARS:** 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. March 8 - Talk RA relief expeditions, 22nd - Night on the air - Invitation to Scouts/Novices. Barry Taylor. (0527) 542266.

**Droitwich Spa ARC:** 1st Tuesdays, 8pm. Droitwich Community Hall. Many interesting evenings already booked. Jenny Read. (0905) 771571.

## HERTFORDSHIRE

**Hoddesdon RC:** Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. March 3 - Preparation for London Amateur Radio Show, 17th - Visit to Martin Lynch's shop in Ealing, 18th - Club annual dinner at The Chequers Inn, Wareside, Nr. Ware. John G70CI. (0920) 466639.

## KENT

**Bromley & DARS:** 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. March 15 - Antenna demonstration - Ian Daniels and Jim Burr. A Messénger. 081-777 0420

**Hilderstone RS:** Fridays, 7.30pm. Hilderstone College, St. Peter's Road, Broadstairs, Kent CT10 2AQ. March 4 - What brought me into amateur radio, 11th - Equipment sale, 18th - Practical evening, power supply 0-20V. (0843) 869812.

**Medway AR & TS:** Fridays, 7.30pm. Tunbury Hall Catkin Close, Tunbury Avenue, Walderslade, Chatham. February 25 - Club AGM, March 4 - Boxing contest (yes really), ladies welcome, 18th - G3GJW 'Smudge' Morse for better or worse? Gloria. (0634) 710023.

**West Kent ARS:** 1st and 3rd Fridays. The School Annex, Camden Road, Tunbridge Wells. March 4 - Informal meeting, 18th - Bring & Buy, 10% donated to club funds. John Taylor G3OHV. (0892) 664960.

## LANCASHIRE

**Preston ARS:** Thursdays, 8pm. The Lonsdale Sports & Social Club, Fulwood Hall Lane, Fulwood, Preston. March. Eric Eastwood G1WCQ. (0772) 686708.

**Rochdale & DARS:** Mondays, 8pm. Cemetery Hall, 470 Bury Road, Rochdale. March 21 - Talk 'Lego Bricks PC' by G3RIK. G7DAI. (0706) 376204.

## MERSEYSIDE

**Sefton ARC:** Fortnightly meetings at The Liverpool Prison Officers Club. Details from G4KIN. 051-531 0991 or G8YPL, QTHR.

## NORFOLK

**Norfolk ARC:** Wednesdays, 7.30pm. Formal meetings: University Arms, South Park Avenue, Norwich, Informal meetings: Hewett School, Hall Road, Norwich. March 2 - (formal) Safety in the shack by Arnold G3PTB, 9th - (informal) Night on air, construction ARP, Morse practice, club coach to Picketts lock, 16th - (formal) First h.f. NFD briefing, 23rd (special) The making of 'Anglia At War' by Richard Kennan. Sheila Snelling G0KPV. (0603) 618810.

## NOTTINGHAMSHIRE

**Mansfield ARS:** 2nd Mondays, 7.30pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. March 14 - Junk sale. Mary G0NZA. (0623) 755288.

## SHROPSHIRE

**Salop ARS:** Thursdays, 8pm. Oak Hotel, Shrewsbury. February 24 - A demonstration of FAX/SSTV by Clem G0ALV, March 10 - A construction/project discussion night by Terry G8DIQ and Paul G7LRB, 24th - A second construction night, advice and discussion, leading to the under a fiver construction competition. Sheila Blumfield G0SST. (0743) 361935.

## SOMERSET

**Wincanton ARC:** 1st & 3rd Mondays, 7.30pm. The Community Lounge, King Arthur's Community School, Wincanton, Somerset BA9 9BX. March 7 - CR100 & CR150 Receivers & early transmitters, 21st - Open evening. Dave G3ZXX. (0963) 34360 Or Andy G1FPW. (0747) 51381.

## STRATHCLYDE

**Milton of Campsie ARS:** 2nd Wednesdays, 7.30pm. Milton of Campsie Community Hall. Alan Foulis GM7PGT. 041-779 1444.

## WARWICKSHIRE

**Stratford-upon-Avon & DRS:** 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. February 28 - Surplus sale, March 14 - 'Something in the sky' by Ken Sheldon G4NIJ. Mr A Beasley G0CXJ. (0608) 682495.

## WILTSHIRE

**Trowbridge & DARC:** 3rd Wednesday, 8pm. The Southwick Village Hall, Southwick, Trowbridge. March 2 - Worked All Britain awards group talk by Ivan G3GKC, 16th - Open evening. Ian G0GRI. (0225) 864698.

# junior listener

By Jon Jones

## Spanish Tip

I'm still receiving letters from listeners following my comments on Spanish language transmissions in the January *Junior Listener*. The latest suggestion comes from **Tony Siemieniago** who lives near Swindon. He also has an interest in Spanish and finds Radio Madrid on 585kHz medium wave to be very reliable for evening listening. If you want to contact the station for programme details, the address is: Radio Nacional De España, Casa de la Radio, Prado del Rey, 28023 Madrid, Spain.

## Novice Start-up

It's not surprising to find that many new short wave listeners become drawn to amateur radio as a natural extension to their hobby. The latest to write is **C Yorke** from Liverpool. He would like to know a little more about the Novice Licence.

The licence was first introduced back in 1991 as an attempt to encourage people of all ages to take up amateur radio. One of the great things about the Novice Licence is that it gives you access to most of the major bands, albeit at low power. This latest licence also allows the operator to send messages from computer in addition to the more conventional Morse and voice transmissions. This means that the newcomer can really experience the whole range of amateur activities.

The licence also features a very well structured training programme designed to ensure that all those applying have a good basic grounding in radio and operating procedures. The training programme is organised by the Radio Society of Great Britain on behalf of the Radiocommunication Agency. These courses last about twelve weeks and involve around thirty hours of tuition. The course contains lots of practical work and you have the opportunity to build your own receiver and an audio amplifier. In addition to the electronics, the course teaches the student how to operate radio equipment safely.

Once the course has been

completed you receive a certificate that qualifies you to sit the Novice Radio Amateur Exam. These are held four times a year in March, June, September and December. The exam lasts about an hour and a quarter and comprises forty-five multiple choice questions covering the work previously completed on the novice course. With both the course and examination successfully completed you can apply for the Novice Licence. To help attract youngsters into the hobby the licence is free to anyone under the age of twenty-one. For everyone else it costs fifteen pounds.

Once you've got your licence you can transmit and receive Morse, telephony, RTTY and data signals on five h.f. bands and four v.h.f./u.h.f. bands. In all cases the maximum transmitter power is three watts. Although this doesn't sound a lot, by careful choice of antenna, frequency and time of day you can work around the world. The great benefit of this low power working is that it forces you to think before you transmit. If you are to make best use of your three watts you have to make sure you have a clear frequency and your antenna is perfectly matched to your transceiver.

If you would like some more information I would recommend you contact the Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Tel: (0707) 659015.

## Holiday Radio

I received a very interesting letter this month from **Mark Mahabir** (16) of Leicester. He's been a keen short wave listener for about four years with independent radio and satellite TV being his main interests. The receiver in use is a Ferguson PR39 with an Amstrad-Fidelity SRD-400 satellite receiver for TV. Once he's finished his A Levels he's hoping to install a motorised satellite dish and then turn his attention to becoming a radio amateur. On the career front he's hoping to take a media and communications degree course and pursue a career in either broadcasting or journalism.

Anyway, getting back to the point of his letter, Mark is off to Cyprus in the summer and would like to continue his listening while on holiday. He asks if there's any way of finding out details of all the local a.m. and f.m. transmissions on the island. You could try writing to the local tourism office but perhaps more readily available is the *World Radio Television Handbook* (or *WRTH* as it's frequently known). This amazing publication lists comprehensive radio and TV information for every country in the world. By way of an example, here's a few details that I managed to put together to answer Mark's question.

### Cyprus Broadcasting Corporation

PO Box 4824, Nicosia

**Medium wave:** Paphos 558kHz, Nicosia 603kHz and 963kHz, Limassol 1044kHz

**FM:** 91.1, 94.8, 97.2, 90.2 and 96MHz

### British Forces Broadcasting Service - Cyprus

BFBS Akrotiri, BFPO 57

Dhekeilia 99.6/95.3MHz

Akrotiri 92.1/89.9MHz

Nicosia 99.6/85.3MHz

BBC East Mediterranean Relay

639, 720 and 1323kHz + many short wave frequencies.

### Bayrak Radio & Television Corporation

Yeni Iskele 1098 and 1494kHz

Sinan Dagi 87.8, 98.1, 90.6MHz

Selvili Tepe 92, 102 and 105MHz

## LAST WRITES!

This is the last 'Junior Listener' column I will be writing. My job is taking me away from home much more often and I am finding it increasingly difficult to continue to meet the Editor's deadlines. I have enjoyed getting the column off the ground and I know that Elaine Richards, my successor, will take it to even greater heights.

Elaine already writes 'Novice Natter' in *Practical Wireless* and will, I'm sure, develop 'Junior Listener' to cater even more for the beginner to our wonderful hobby.

**If you want to write to Elaine about any topic covered by 'Junior Listener' her address is PO Box 1863, Ringwood, Hants BH24 3XD. Don't forget to include an s.a.s.e. if you expect her to reply.**

## ISWL News

The International Short Wave League callsign, GX4BJC (*the X means it's a club callsign - Ed*) will be allocated to a different ISWL member each month during 1994. A special QSL card will be available to anyone working or hearing the call. Reports should be sent, either via the ISWL QSL bureau or direct, to the club callsign QSL manager: **Dave Beale G0DBX/G-10618, "Kenwood", London Road, Louth, Lincolnshire LN11 8QH.**

The ISWL QSL Bureau address, for cards intended for other members, is: **ISWL QSL Bureau, 155 Bruce Street, Swindon, Wiltshire SN2 2EN.** The Bureau is administered by Tony Gale G7NUR/G-13287.

## Catalogue from C.M.Howes Communications

C.M.Howes Communications have just published the biggest ever edition of their Radio Kits Catalogue. There are more kits and metalwork packages than ever before with projects that are designed to appeal to anyone with an interest in radio and home construction.

To obtain a copy, send an A5 or A4 s.a.s.e. (with 25p stamp) to **C.M.Howes Communications, Eydon, Daventry, Northants NN11 3PT.** A couple of IRCs would be appreciated from overseas readers. (Please note the changed postcode)



## MONITORING THE YUGOSLAV CONFLICT

by Langley Pierce

2nd Edition



The latest guide to monitoring the Yugoslav radio transmissions of the UN, Aircraft and Shipping.  
Lists the latest active frequencies.

## SHORTWAVE DIRECTORY

A Guide to Worldwide HF Comm.

EDITED BY LARRY VAN HORN  
8th Edition Copyright 1993

## Intercepting Numbers Stations

by Langley Pierce



Unlocks the Secret World of Spy Radio Transmissions. Details the cloak and dagger activities of the CIA, MI6, the KGB, the MOSSAD and many more... Lists the world's most effective frequencies.

## New Books

Details of three new Radio books have arrived in the SWM offices:

*Monitoring the Yugoslav Conflict*, by Langley Pierce, is now in its second edition. The frequency lists now include the UNHCR, Red Cross, French Forces and many more. £4.95.

*Intercepting Number Stations* by Langley Pierce gives details of the 'Numbers' stations which appear to be still very active in spite of the end of the Cold War. £9.95.

*Grove Shortwave Directory* - 8th Edition. Edited by Monitoring Times expert Larry Van Horn, this new edition has been extensively updated and expanded. £18.75.

All prices include UK p&p from **Interproducts, 8 Abbot Street, Perth PH2 0EB.** Tel/Fax:(0738) 441199.

## It Was 40 Years Ago Today...

well, almost. From Short Wave Magazine, February, 1954:

### ANOTHER TRANSISTOR TRIUMPH

Among those amateurs experimenting with transistors is G3HMO (Buckingham), whose line of approach is a little different from most, in that he is *making* his own germanium triodes! Having obtained LF oscillation around audio frequencies, the next step was to try to get one of his home-made transistors oscillating in our lowest frequency amateur band. This was successfully achieved on January 3, when in the presence of G5RZ and G6FO—assisting in the experiment—oscillations were obtained on 1900 kc, but with a very rough and unstable note. By the use of an 1898 kc crystal, however, the signal was cleaned up considerably, but was still not good enough to do much with on the air. G3HMO then made yet another transistor, and using a QCC Type P5 crystal of 1858 kc, was able to radiate a perfect T9x CW signal, received at S9+10 at G6FO 1½ miles distant on January 19 for his first "cold QSO". On Sunday, January 24, extensive tests were undertaken. The transistor CC CW on 1858 kc was received at RST-569 by G5RZ, Leighton Buzzard (15 miles); at 559x by G3JNU, Bedford (22 miles); at 449

by G3ADK, Luton (25 miles); at 559 by G5WW, High Wycombe (28 miles); and at 449x by G6XH, Chorley Wood (34 miles). Input to the single stage transistor transmitter was 20 milliwatts maximum. Later G3HMO attempted to phone, which was received locally at readable strength by G6FO and G6KJ. Note that all this was with a home-made transistor, giving an r.f. output of perhaps 5mW; taking the input power as 20 milliwatts and G6XH as "best DX," the power-range figure is 1,7000 miles per watt on this QSO. These striking results represent probably the very first use of a home-made germanium triode for actual communication purposes. It is also interesting to note that, in the course of the tests, G3HMO discovered that he could receive phone from local stations G6FO and G6KJ on the transistor transmitter, which was thus operating as a true transceiver! Experiments are proceeding and will be full described in SHORT WAVE MAGAZINE in due course, with the circuitry and other details.

## Contest News

The **International Listeners Association** has opened its quarterly contests to non-members. They have told us of two contests in April:

On 10 April the **2nd Prefix Contest 1994** and on 17 April the **2nd Set Listening Period 1994**. Both contests cover the period 0000 to 2400UTC, but you must select six hours total logging time.

For the Prefix Contest monitor the 7 and 14MHz amateur bands and log as many amateur prefixes as possible on each band. Multiply the totals from each band together to get the total points.

For the Set Listening Period monitor the 31 and 41metre broadcast bands and log as many stations as possible in the time allowed.

For both contests send a copy of your log and an entry fee of £1.00 to **K Burnell, Contest Manager, 91 Mabllins Lane, Coppenhall, Crewe, Cheshire CW1 3RG** who, I'm sure, would be willing to send you details of other contests on receipt of an s.a.s.e.

## Residential Radio Course

In our December '93 issue we gave details of a residential weekend course called An Introduction to Amateur Radio at Kilve Court Residential Education Centre. Unfortunately the course dates have had to be changed from February to 15-17 April 1994. All other details are as previously stated.

Further details from: **Kilve Court Residential Education Centre, Kilve, Bridgwater, Somerset TA5 1EA. Tel:(0278) 741270 / 741326, Fax:(0278) 741551.**

### CQ all Amateur Radio Educationalists

The Science and Technology through Educational Links with Amateur Radio (STELAR) Group was launched at the January Meeting of the Association for Science Education as a means of supporting good practice in the teaching of Science and Technology.

The first initiative of the Group is to distribute the AMRED (AMateur Radio in EDucation) newsletter to all interested Educationalists. Initially AMRED will appear termly (August, December and April), with the first edition scheduled for Summer Term 1994.

The Chairman of STELAR is Richard Horton G3XWH, the Head of Physics & Information Technology at Harrogate Ladies' College.

STELAR would like to hear from all Schools and Colleges who have an interest in Amateur Radio activities. Information to forward should include full contact details (Address / telephone / fax / packet BBS), callsign of club station, contact person, modes and frequencies of

operation and any details of club activities (e.g. special event stations).

If there is any particular activity that you would like to see STELAR pursue, or if you are keen to take part on the organisational level, please include these in the communication.

The Group is attempting to form international links with educationalists throughout the world and to this end three of the committee have already been invited to speak at the annual meeting of the German equivalent of STELAR - 'Amateurfunk in der Schule' in March. Details of any international contacts you may have would be appreciated.

Richard can be contacted at **STELAR, c/o Harrogate Ladies' College, Clarence Drive, Harrogate, North Yorkshire HG1 2QG**. He is also contactable electronically as **G3XWH @ GB7CYM, OSCAR22/KITSAT G0HCA** (Harrogate Ladies' College Club Callsign), on **Internet: COM2RH@GPS.LEEDS.AC.UK**, by **Fax: (0423) 871027**, or if that's not enough he's **QTHR. (Phew! - Ed)**

### Eddystone User Group

For many years the EUG has been admirably administered by Kathy Moore. Due to the increasing membership numbers, and the pressures of a full-time job, Kathy has had to pass the job over to others.

Thanks to the co-operation of Chris Pettitt, the Managing Director of Eddystone Radio, the administration will be taken on by a group of volunteers at the Eddystone Works.

From 1 April, all subscriptions (which remain at £10 for 1994-5) and other queries should be directed to **EUG, c/o Eddystone Radio Ltd., Alvechurch Road, West Heath, Birmingham B31 3PP**. Cheques for subs should still be made payable to EUG. Regrettably, no telephone queries can be answered.

Newsletter and technical queries will be forwarded to Ted Moore, who will continue to compile the newsletter, but printing and distribution will be handled by the Eddystone Works.

### Pocket Size Frequency Counter

Quantek Electronics have announced a high sensitivity pocket size frequency counter model FC2000 capable of measuring frequencies from 1MHz to 2.4GHz.

Conventional frequency counters typically have a specified sensitivity of 10mV. The sensitivity of the FC2000 is less than 1mV between 10 and 850MHz and is typically 225µV @ 150MHz, this enables the FC2000 to be used for measuring transmitted radio frequency signals as well as

laboratory bench measurements.

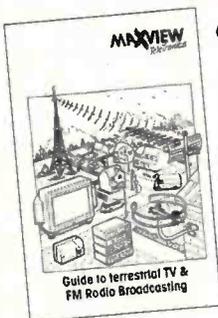
The compact and ruggedly-built FC2000 features a bright 8-digit LED display, 2 gate times, hold function, 50Ω BNC input, internal 700mAh NiCad batteries and is supplied complete with a mains adapter/charger and telescopic antenna.

The FC2000 costs £119 + £5 P&P direct from:

**Quantek Electronics, 3 Houlday Road, Birmingham B31 3HL.**

### Getting The Best Reception

Now available is a new FREE booklet entitled Guide to Television and FM Radio Reception. This 16-page guide is available from **Maxview Limited, Common Lane, Setchey, Kings Lynn, Norfolk PE33 0AT. Tel:(0553) 810376**



### Book Catalogue

Of interest mainly to US readers, is a catalogue (or catalog!) listing a wide range of radio books. Copies obtainable from **Tiare Publications, PO Box 493, Lake Geneva, WI 53147, USA. Tel:0101-414 248-4845**



# news

### New ITU Members

Since 1 January 1993 the following new Members have joined the ITU:

Czech Republic (1 January 1993)  
Georgia (7 January 1993)  
Slovakia (23 February 1993)  
Kazakhstan (23 February 1993)  
Micronesia (18 March 1993)  
The former Yugoslav Republic of Macedonia (4 May 1993)  
Turkmenistan (7 May 1993)  
Eritrea (6 August 1993)  
Andorra (12 November 1993)

# news

## Broadcast Schedules

Every post seems to bring another batch of shortwave broadcast schedules into the SWM office. Obviously we cannot publish everything or there would be no room for anything else in SWM, but we will attempt to squeeze in as many of the English language listings as we can using a condensed "frequency(MHz) / time(UTC) / target region" format. We will also try to list the dates for which these schedules are valid.

## Radio Nigeria

|       |           |                    |
|-------|-----------|--------------------|
| 3.326 | 0430-2300 | Lagos Transmitter  |
| 4.770 | 0430-2300 | Ibadan Transmitter |
| 4.990 | 0430-2300 | Lagos Transmitter  |
| 6.025 | 0430-2300 | Enugu Transmitter  |
| 6.050 | 0430-2300 | Ibadan Transmitter |
| 6.090 | 0430-2300 | Kaduna Transmitter |
| 7.572 | 0430-2300 | Kaduna Transmitter |
| 9.570 | 0430-2300 | Ibadan Transmitter |

English Network News on all stations 0600-0630, 1500-1530 and 2100-2130 daily.

## Voice of Nigeria

7.255, 9.690, 11.770 and 15.120MHz

## Radio Tashkent (Spring/Summer)

|        |           |                  |
|--------|-----------|------------------|
| 7.190  | 0100-0130 | English language |
| 7.285  | 1200-1230 | English language |
| 7.285  | 1330-1400 | English language |
| 9.715  | 0100-0130 | English language |
| 9.715  | 1200-1230 | English language |
| 9.715  | 1330-1400 | English language |
| 15.295 | 1200-1230 | English language |
| 15.295 | 1330-1400 | English language |
| 17.745 | 1200-1230 | English language |
| 17.745 | 1330-1400 | English language |

## Syrian Radio & Television

|        |           |                                  |
|--------|-----------|----------------------------------|
| 9.950  | 2010-2105 | Europe                           |
| 9.950  | 2110-2210 | USA, Canada, Japan and Australia |
| 11.625 | 2010-2105 | Europe                           |
| 11.625 | 2110-2210 | USA, Canada, Japan and Australia |
| 12.085 | 2010-2105 | Europe                           |
| 12.085 | 2110-2210 | USA, Canada, Japan and Australia |
| 15.095 | 2010-2105 | Europe                           |
| 15.095 | 2110-2210 | USA, Canada, Japan and Australia |
| 15.373 | 2010-2105 | Europe                           |
| 15.373 | 2110-2210 | USA, Canada, Japan and Australia |

## Radio Cairo External Services

|       |           |        |
|-------|-----------|--------|
| 9.900 | 2115-2245 | Europe |
|-------|-----------|--------|

## RADIO AND TV DX NEWS

With the liberalisation of Eastern Europe so Poland has seen a dramatic change in emphasis from national to regional radio stations. The former Radio Poznan which airs now as Radio Merkur is now a top station, transmitting 24 hours a day in the old OIRT band 67.40MHz (10kW) and the 'new' Band 2 at 102.7MHz (100W). Numerous FM stations are now on-air, most are running in stereo and transmit dual band, i.e. the OIRT and Band 2 FM - there are still many pirate (unlicensed) radio stations in operation! Estonia will experience a dramatic increase in local broadcasting with 45 new licenses being issued to TV and radio stations - at least 20 are already in operation!

Free broadcasting is about to happen in Nigeria following deregulation, some 25 companies have received licences to set up their own TV stations - 14 for terrestrial and the rest on cable/satellite. Lagos will sport 4 new stations and new regional broadcasters will be sited at Ibadan, Aha, Enugu, Obosi, Abuja, Warri and Benin. Terrestrial broadcasters will operate at UHF. Elsewhere in Africa, Zimbabwe have dropped their announced plans for expansion - a shortage of cash is blamed. There will be a 'resuscitation of short wave transmission' to provide radio coverage of the country and beyond.

The Ministry of Information and Broadcasting in Tanzania have confirmed that their own TV service should be on the air by end 1994 based around 40% local material and the rest imported. No news yet on channels to be used.

German Digital Audio Broadcasting (DAB) will start on an experimental basis in 1995 despite reservations expressed over funding by mainline broadcaster ARD. The 1.5GHz band is most likely to be exploited although initial transmissions on an experimental basis are thought to be likely at 50MHz. The Dutch are now testing with 12 months of DAB transmissions though, unlike their neighbours 50MHz test frequency, the Dutch are using the Band 3 TV spectrum at 189.25MHz using a 1kw transmitter at Haarlem with a 30 watt relay at Hilversum.

Rumours are suggesting that the ARD-1 network could close on 31 December 1995 following the considerable loss of advertising revenue taken by the popular new stations such as RTL.

Roman Catholics in Colombo, Sri Lanka are protesting over the construction of a new VoA site at Iranawila. The site, of some 400 acres, is 80km NW of Colombo and is planned to be on the air during 1995 and replacing the existing 40-year old facility at Ekala.

The problem of video delays in TV transmission circuits caused by frame stores, digital mixers and the like resulting in a loss of audio synchronisation is to be rectified by BBC engineers. A small data stream is inserted into the video blanking period of the picture which can be analysed and determine the degree of video delay experienced throughout the vision chain. At the output of the studio the total video delay experienced is calculated and converted into an audio delay control process, thus ensuring that the combined audio and video output from the studio is in sync.

The balloon TV transmitter anchored at Key West last March apparently crashed taking the TV Marti (CIA) propaganda transmissions towards Cuba off the air. Late Summer saw the balloon back in operation and the Cubans resumed jamming the Band 3 programming!

And finally the DTI have approved the use of 2.4GHz for 'Spread spectrum technology for industrial use'. This will allow communication between computers without the use of cables resulting in less installation time and a more flexible approach to office layouts for expansion, rebuilding and the like. Problems that will occur are that of data security and of data integrity across a transmission system.

## Introduction Of New Telephone Codes

The telephone code for the former Yugoslavia (38) changed on 1 October 1993. On that date the following codes came into service:

|   |     |
|---|-----|
| Yugoslavia                                | 381 |
| Croatia                                   | 385 |
| Slovenia                                  | 386 |
| Bosnia / Herzegovina                      | 387 |
| The former Yugoslav Republic of Macedonia | 389 |

Also, since 1 October 1993 the code of 291 is assigned to Eritrea, and the Republic of San Marino is now independent of the Italian system with a code of 378.

New codes of 379 for the Vatican City and 377 for Monaco will be introduced in the near future.

## BBC World Service News

**Sam Younger** has been appointed to the new post of Director of Broadcasting for the BBC World Service.

This appointment follows a decision to restructure World service Management on a regional basis. Sam will work through six regional heads to commission and schedule all World service radio broadcasts, currently over 850 hours a week, in 39 languages and listened to by 130 million listeners world wide.

**Leslie Jewell** has become the BBC Moscow Bureau's bi-media producer for both World Service Radio and World Service Television.

Leslie began her broadcasting career with the World Service as a reporter in 1985 and has worked as a staff producer for Reuters Television in both New York and St Petersburg.

The BBC has extended its **Arabic Broadcasts** and launched a new look schedule.

The Arabic Service, which is the largest of the BBC's non-English services, has extended its daily transmission by an hour to 11½ hours daily.

The new schedule, too large to print here, runs from 0330 to 2100UTC daily. Further information is available from **BBC World Service, International Press Office, Bush House, London WC2B 4PH.**

## In-Car Power Connector

J.P. Micro Services have introduced a simple, yet effective, device for connecting all those electronic devices to your car's power, known as a



Tim Box. The adaptor plugs into the car's cigarette lighter socket with a fused plug and provides connectors for at least three devices without the need to attach power connectors. It is available at a price of £12 (plus £1 P&P) from **J.P. Micro Services, Unit 5, Churchward Trading Estate, Barrs Court Road, Hereford HR1 1EN. Tel:(0432) 355155, Fax:(0432) 354154.**

## National Channels Transmitter News

We have been informed of the following changes to the national networks:

11 January 1994 - New Radio 1 FM transmitters at **Churchtown Hill**, Gloucestershire on 98.6MHz and at **Manningtree**, Essex on 97.7MHz.

18 January 1994 - New television relay, called **St Fillans**, situated at

Wester Glentarken, 45km west of Perth (NGR NN 663 248), carries these transmissions: BBC 1 Scotland - Ch51, BBC 2 Scotland - Ch44, ITV Scottish - Ch47, C4 - Ch41. All vertically polarised

19 January 1994 - New television relay, called **Locheanhead**, situated at Carstran, 52km west of Perth (NGR NN 594 227), carries these transmissions: BBC 1 Scotland - Ch58, BBC 2 Scotland - Ch64, ITV Scottish - Ch61, C4 - Ch54. All vertically polarised

25 January 1994 - New television relay, called **Portwood**, situated 1km NE of Stockport (NGR SJ 908 911) carries these transmissions: BBC 1 North-West - Ch22, BBC 2 North-West - Ch 28, Granada - Ch32, C4 - Ch25. All vertically polarised.

31 January 1994 - New television relay, called **Kintra**, situated 25km S of Oban (NGR NM 830 048) carries these transmissions: BBC 1 Scotland - Ch40, BBC 2 Scotland - Ch46, ITV Scottish - Ch43, C4 - Ch50. All vertically polarised.

## Listen With Grandad by Leon Balen & David Levetett



*I see Grandma is not amused at having her smalls aired in public.*

All frequencies in this article are in MHz, all times are UTC

# The Pacific Airband Scene

The North Pacific is a notoriously difficult part of the world to monitor from Europe and on the aviation scene there seems to be very little published. R O Ball hopes to clarify things.

At first, monitoring the aeronautical bands in the Pacific tends to lead to total confusion as, having first ascertained that the North Pacific is generally divided into three areas for the sake of h.f. communications, some of these areas are further divided on a company-to-company basis. The *Klingenfuss Guide to Utility Stations* whilst acknowledged widely as the utility DXers' Bible is very poor when it comes to the aeronautical bands and *HF Oceanic Airband Communications* by Bill Laver is not too detailed.

The following is the situation whilst monitoring from an oil tanker making voyages from the West coast of North America to Asia

during the first part of 1993. Everything has been gleaned from monitoring rather than from official sources or other publications. I hope it clarifies things!

## Central East Pacific

San Francisco Radio normally operates with at least two streams of traffic, with the third and fourth streams being brought into use as traffic levels dictate. The traffic is divided by company rather than direction or height. The frequency 'families' are always the same, with the same companies using the same families.

The various families and users are:

| Frequencies                   | Users  |
|-------------------------------|--|
| 2.869/5.547/<br>11.282/13.288 | United, Continental, New Zealand, Qantas, Allnippon: and if the third and fourth groups are not in use, Japanair.  |
| 3.413/5.574/<br>8.843/13.354  | Delta, UPS, TWA, Amtram, Northwest, Varag, Dynasty, Indonesian, Cathay, Mandarin World, Air China, Asiana, Aloha, Hawaiian, Philippines: and if the third or fourth groups are not in use, Singapore, Koreanair, Canadian, Northwest, Malaysian. |
| 6.640/11.342                  | Northwest, American, Military, Canadian, Air Canada, Japanair if fourth groups is not used.  |
| 6.673/10.057                  | Japanair, Eva, Koreanair, Malaysian, Singapore, Nipponcargo.   |

San Francisco's FIR extends virtually from the West coast of North America as traffic is passed to Vancouver on 135.2 at 134°W, Seattle on 132.7 at 128°W, Oakland on 134.14 (occasionally 133.37) at 127°W or Los Angeles on 132.15. Trans-pacific flights enter Honolulu's FIR at 150°W, generally North of 39°N, whilst those to the Hawaiian Islands Eastbound transfer at Zolta, Adeny, Beats or Deroc, and Westbound at Coppy, Esagro or Fezic; these spelling are only guesses! I would also guess that all the named points were probably at 150°W also. Flights to Australasia are passed to Honolulu on the South Pacific group of frequencies around 20°N 143°W.

The first two listed families of frequencies are shared with Honolulu for flights towards the Hawaiian Islands and there seems to be a gentleman's agreement between them and San Francisco that the former uses 13.288 and 5.547 as primaries whilst the latter uses 11.282 and 5.547 from the first family, and for the second family Honolulu uses 13.354 and 3.413 as primaries whilst San Francisco uses 8.843 and 5.547. There are obviously a few exceptions to these 'rules' but they hold good for 90% of the time.

In mid-February 1993 for the first group of frequencies listed above San Francisco used the daytime primary of 11.282, from as early as 1630, though normally the change is made around 1730, with 5.574 staying in use until the last flights reach v.h.f. range of the coast or are transferred to Honolulu. The daytime secondary of 13.288 comes into use at about 1915 and remains so until 5.574 is brought into operation at around 2330. This pairing is maintained until 0200 when the two are reversed and then around 0400 2.869 becomes the secondary until early local morning (1500) when 11.282 is brought back to use. The night-time is normally 5.574 throughout, but occasionally conditions can be poor enough to warrant the use of 2.869 from around 0400, although this is not very usual, but certainly not out of the ordinary. The frequency changes do not obey any hard and fast rules and can vary as propagation dictates, the frequencies listed here are those generally used, but the changes can occur an hour either side of the times listed here, and obviously as the Summer in the Northern Hemisphere progresses the higher frequencies will be used for longer periods during the day.

| Time | Primary | Secondary |
|------|---------|-----------|
| 1700 | 11.282  | 5.547     |
| 1915 | 11.282  | 13.288    |
| 2330 | 11.282  | 5.547     |
| 0200 | 5.547   | 11.282    |
| 0400 | 5.547   | 2.869     |
| 1500 | 5.547   | 11.282    |

For the second group listed, San Francisco was using 8.843 as the local daytime primary, from about 1600 until 0300, when 5.574 would take over until 1600, the following local morning. There is obviously some overlap between the two primaries, whilst 5.574 is brought into use at 0300, 8.843 is used until the last flight reach the extremes of the FIR which may take until 0400. The night-time primary can be used until as late as 1730. This does not cause too much of a problem for San Francisco to monitor as 5.574 is used as the secondary for the period 1600-1800, when 13.354 takes over until approximately 0100 when 5.574 is re-introduced, which

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is used until about 0300 when 3.413 is used until 8843 is brought into service about 1600.

| Time | Primary | Secondary |
|------|---------|-----------|
|      | 5.574   | 3.413     |
| 1500 | 5.574   | 8.843     |
| 1600 | 8.843   | 5.574     |
| 1800 | 8.843   | 13.354    |
| 0100 | 8.843   | 5.574     |
| 0300 | 5.574   | 3.413     |

The third group of frequencies is brought into use around 1500 as the evening flights from Asia begin to arrive over 150°W, with 6.640 being the primary and 11.342 the secondary. From 1800 the flights are then advised as they call in or are selcalled and told that these two frequencies are reversed. This situation continues until around 0200 when the two are reversed again. Around 0500 sometimes the secondary is made 5.547 and by 0600 all the remaining flights have reached their destination or are transferred to 5.547.

| Time | Primary                      | Secondary                 |
|------|------------------------------|---------------------------|
| 1500 | 6.640                        | 11.342                    |
| 1800 | 11.342                       | 6.640                     |
| 0200 | 6.640                        | 11.342                    |
| 0500 | 6.640                        | 11.342 or sometimes 5.547 |
| 0600 | Flights transferred to 5.547 |                           |

The fourth position is not always brought into use, but when it does, it also caters for the arrival of all the previous evenings' flights from Asia, with 6.673 being the primary from around 1600 and 10.057 being the secondary. At around 1900 the frequencies are reversed and all the traffic is using 10.057 as the primary by 1930. This pair is only used until the peak dies out at around 2215, when the last few flights are generally transferred to 8.843.

The group did not seem to be used so much during March, but on at least one occasion the companies normally heard on 10.057 were heard on 17.904 around 2002.

| Time | Primary                         | Secondary |
|------|---------------------------------|-----------|
| 1600 | 6.673                           | 10.057    |
| 1900 | 10.057                          | 6.673     |
| 2215 | Remaining flights moved to 8843 |           |

As stated above for flights between North America and the Hawaiian Islands, Honolulu shares the first two sets of frequencies with San Francisco. During local daytime 13.288 is used from around 1800, with 11.282 as the secondary until 0100 when 5.547 takes over. This becomes primary around 0400 until 1800. The expected night-time secondary would be expected to be 2.869, but for some reason Honolulu always uses 3.413 from its other family, this is generally utilised between 0400 and 1800, when 11.282 takes over.

| Time | Primary | Secondary |
|------|---------|-----------|
| 1800 | 13.288  | 11.282    |
| 0100 | 13.288  | 5.547     |
| 0400 | 5.547   | 3.413     |

The second group uses 13.354 as the daytime primary from around 1730 until 0300. The one of two things can happen depending on conditions (and the operator!), sometimes 8.843 is brought into use until 0500 or the drop can be straight down to the night-time primary of 3.413. The daytime secondary from 1730 is 8.843 until 0130 when 5.574 or 3.413 takes over until 8.843 is used again.

| Time | Primary | Secondary |
|------|---------|-----------|
| 1730 | 13.354  | 8.843     |
| 0200 | 13.354  | 3.413     |
| or   |         |           |
| 0300 | 8.843   | 5.574     |
| or   |         |           |
| 0400 | 3.413   | 5.574     |
| 0600 | 3.413   | 5.574     |

## North Pacific

The North Pacific group of frequencies is shared between Honolulu and Tokyo. The area is generally North of 37°N and Honolulu takes the guard at 150°W from San Francisco and passes it to Tokyo at 165°E, often at a point called NIPPY inbound or PAYON outbound. Tokyo transfers all traffic to v.h.f. 126.7 at NOUKA (about 1 hr 20 mins Northwest of Narita) or 133.6 when 300nm out of Choisi, a d.f. beacon near Tokyo.

There seems to be a further FIR around Anchorage which operates on v.h.f. only, flights from Asia North of about 53°N are told to call Anchorage on 119.1 when 150 miles west of Shemya or 118.5 when at 160°W when coming from America. This is applicable for trans-pacific flights as well as those for Anchorage itself. Flights South of about 53°N work Honolulu on h.f. the entire way from 150°W to 156°E.

Again both stations try and avoid using the same frequencies at the same time, but with Honolulu using three primaries simultaneously, things can get a bit confusing! The situation arises as the night-time peak from Asia reaches the FIR at 150°W around 0900, and continues until the bulk of the traffic arrives at the FIR with San Francisco at 150°W around 1630. The frequencies are split by the company as follows:

| Frequency           | Users  |
|---------------------|--|
| <b>5.628/10.048</b> | United, Japanair   |
| <b>5.667/6.655</b>  | Northwest, American, Delta, Canadian, Military, All Nippon, Nippon Cargo |
| <b>6.655/5.667</b>  | All other companies  |

One night Honolulu was heard using 2.932 as the secondary in lieu of 10.048, but I have never heard this repeated. This three-way arrangement seems to be quite a recent innovation, as during February all the flights listed on 5.667 were heard on 6.655. After 1550 flights on 5.667 and 6.655 that have not reached the 150°W FIR are moved to 5.628/10.048 as they check in, with the last few flights around 1620 being selcalled and moved.

This pair of 5.628/10.048 are used until about 1800, when 10.048 normally becomes the local breakfast time primary, although it is not totally unexpected if 13.273 is employed instead. The situation between 1800 and 2000 can change on an almost daily basis, the secondary can either be 13.273, 17.946 or 21.925, depending on the operator. The frequency of 17.946 can become the primary from around 2000, but it is more usual if 21.925 is utilised. From about 2130 until about 0400 Honolulu operates with two primaries; 17.946 is used by United and Delta flights, whilst 21.925 is used by all other companies; the two frequencies are used as each other's secondary. The daytime primary is 21.925 seems to be quite recently introduced as not long as 21.964 was the primary for North Pacific area flights.

From about 0330 the secondary becomes 10.048 and this becomes the primary around 0400, with all the traffic off 21.925 and 17.925 by 0520. The secondary becomes 5.638 and this combination is maintained until they swap over any time between 0800 and 0900. It is always completed by the latter as this is when the evening peak reaches the FIR at 165°E.

| Time | Primary                             | Secondary              |
|------|-------------------------------------|------------------------|
| 1800 | 10.048                              | 5.628                  |
| 2000 | 10.048, 13.273,<br>17.904 or 21.925 | Any                    |
| 2200 | 21.925 and 17.946                   | 17.946 and 21.925      |
| 0330 | 21.925                              | 10.048                 |
| 0400 | 10.048                              | 5.628                  |
| 0900 | 5.628 and 5.667 and<br>6.655        | 10.048, 6.655 and 5667 |
| 1600 | 5.628                               | 10.048                 |

Despite 8.951 being allocated to this region I have never heard Honolulu on this frequency and apart from the one night when 2.932 was used in lieu of 10.048 the same holds true for this as well.

Tokyo's daytime primary frequency is always 13.273, this is brought into use at any time from 2230 for inbound flights and remains as primary until about 0400, when 8.951 takes over. However, Tokyo is in no hurry to move traffic off 13.273 and traffic already on that frequency is left on until reaching v.h.f. range of the FIR with Honolulu, which may be as late as 0700. The daytime secondary is 10.048 and from 0315 this is used as a second primary for Japanair, United and Delta flights only, this remains until around 0600. 13.273 has lost its last flight, it is not totally unknown for 5.628 to be used in place of 6.655 on rare occasions.

From around 1000 the night-time primary becomes 2.932, the secondary being 8.951 until about 1130 and then 6.655 from then on, or sometimes 8.951 continues straight through; it is not totally unheard of for 5.628 to be used as a secondary for this period. The local early morning period is usually very quiet and any number of combinations of frequencies from 2.932, 5.628, 6.655 and 8.951 can be used, until 8.951 comes into use as an early morning primary around 1900, with 10.048 taking over around 2130.

| Time                             | Primary         | Secondary                       |
|----------------------------------|-----------------|---------------------------------|
| 2230                             | 13.273          | 10.048                          |
| 0315                             | 13.273 + 10.048 | 10.048 + 13.272                 |
| 0400                             | 8.951           | 13.273                          |
| 0700                             | 8.951           | 6.655 (possibly 5.628)          |
| 1000                             | 2.932           | 6.655 (possibly 5.628 or 8.951) |
| 1900                             | 8.951           | 10.048                          |
| 2130                             | 10.048          | 13.273                          |
| Period 1830-2230 very changeable |                 |                                 |

## Central West Pacific

The Central West Pacific stretches from the Hawaiian Islands in the East across to the Philippines and the East coast of Asia, and from approximately 40°N to just South of the equator. The boundary between the North Pacific and Central West Pacific is such that all trans-Pacific traffic stays in the former and all traffic from the Hawaiian Islands to Japan and points further South stays in the latter. The two main stations in this area are Tokyo and Honolulu, the latter has two families for daytime traffic, 21.985 is used from 2000 for flights in 'Guam Area', which includes Islands as far East as the Marshalls. The frequency 13.300 is used from around the same time for flights between the Hawaiian Islands and Asia, mainly Japan. The FIR between Honolulu and Tokyo appears to lie along latitude 27°N and longitude 165°E, although one Reach flight was told to contact Tokyo while passing 21°N 150°E. Traffic from the Guam area usually passes to Tokyo's control at a point called OMLET.

The other stations in this region are Naha (Okinawa), Manila and Port Moresby. Traffic bound for Australasia is passed to Port Moresby at a point called Peroc, 5°N 143°E or 4°N 132°E. The boundary with Manila seems to be at 130°E, possibly the same

holding true for Naha? I would guess that flights Westbound towards the Philippines are handled on v.h.f. as they get within range and then on to 8.942 if they are continuing without stopping in the Philippines.

As stated above the daytime primaries of 2.198 and 13.300 generally start being used around 2000, although the latter especially can be used anytime from 1803. These two frequencies use the common secondary of 17.904, this can be used for a primary for an aircraft in either areas but it is not unusually. Around 0800 Tokyo moves from 11.384 to 8.903 and Honolulu then uses 11.384 as the night-time primary for both areas, in any case 13.300 is very quiet in the period 0600 onwards. The night-time secondary is 6.532 for both areas also, and from around 2.998 is used as a back-up for flights very close in. This can be used as a primary, mainly for flights to Honolulu, with 6.532 still being used as the secondary.

| Time | Primary         | Secondary              |
|------|-----------------|------------------------|
| 2000 | 21.985 + 13.300 | 17.904                 |
| 0800 | 11.384          | 6.532 2.998 as back-up |

Although allocated to the region, 3.445, 4.666 and 8.903 are rarely used by Honolulu. I would have said that they were never used but one night Honolulu was having difficulties with Qantas and New Zealand flights and had to resort to using 8.903.

Tokyo's daytime primary is 11.384 generally, and this is in use from around 2100, with 8.903 being used as the secondary from the same time, and 13.300 being used in this role from 2300. It is not totally unheard of for 13.300 to be used as the primary around 0100, and on more than one occasion Tokyo has been heard on 17.904. Around 0800 Tokyo starts to use 8.903 as the evening primary, the choice of secondary is variable to say the least; 11.384, 4.666 or usually 6.352 can be used. From about 1200 it is usual for Tokyo to drop down again, either to 4.666 or straight to 3.455, with 2.998 being the usual secondary. Around 1900 Tokyo can start using 8.903 as the early morning primary, or flights can be directed to 11.384 a little later.

| Time | Primary        | Secondary             |
|------|----------------|-----------------------|
| 2100 | 11.384         | 8.903                 |
| 2300 | 11.384         | 13.300                |
| 0800 | 8.903          | 6.352 or 4.666        |
| 1000 | 3.455 or 4.666 | 4.666, 3.455 or 2.998 |
| 1200 | 3.455          | 2.998                 |

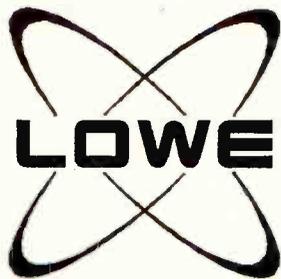
Both Naha and Manila make a point of not using Tokyo's frequencies, even as secondaries. During local daytime (2300 onwards) they generally both use 8.903 as primary and 13300 as secondary. If flights call on 11.384 they are generally answered by Naha or Manila and sent to 8.903. Both stations generally use the pairing of 4.666/8.903 during the night. It is not unusual for Manila to use South East Asian frequency of 8.942 as the daytime secondary.

Port Moresby is not heard often, but in the local evening (1000) they are on 8.903/6.532, and possibly 2.998.

Seoul is also in this family of frequencies, however they seem to deal with traffic only from Koreanair flights. All flights to and from Korea seem to work Tokyo on v.h.f. whilst overflying Japan and do not seem to revert back to h.f. whilst flying across the Korean Strait. Seoul uses 13.300 during the local daytime.

## Phone Patches

Honolulu seems to use four frequencies for phone patches, namely 21.964, 17.946, 13.384 or 11.342 depending on the time of the day. San Francisco generally uses 17.904 or one of the frequencies in the third or fourth groups of frequencies listed above.



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# Monitoring HF Transmissions To and From Aircraft

The How, What, Where and When of Monitoring Aircraft on HF by  
Colin Goodall

Outside Europe and North America the majority of aircraft reporting is done on the h.f. bands, this is basically because of the distances involved and the lack of local v.h.f. networks. Within Europe the best place to find h.f. transmissions is from Shannon, the Canaries and the Azores. However, outside Europe (and North America) the majority of communications are undertaken using s.s.b. on h.f. The types of transmissions fall into two categories; position reporting by aircraft and weather reports to aircraft. There is one other type of h.f. transmission and that is reports to and from the airline operator company agent.

## SSB Transmissions

All of these transmissions are made using worldwide agreed blocks of frequencies between 2.5 and 21MHz using upper sideband mode. The nearest to us here in the UK are the transmissions to and from aircraft crossing the North Atlantic which are made from Shannon in Western Ireland. The North Atlantic is split into five areas and these are controlled by Shanwick (an amalgam of Shannon and Prestwick, of which more later); Iceland; Gander; New York and Santa Maria (in the Azores), see Fig. 1. Entry to the South Atlantic is controlled by the Canaries; San Juan in Puerto Rico; Paramaribo in Surinam and Dakar in West Africa.

Other areas of the world where h.f. is the major (and sometimes only)

communication system are Africa, Asia and the Pacific. It may come as a surprise to you but here in the UK you can monitor most of the world h.f. traffic using only simple antennas and a reasonably cheap radio. What you need is the ability to receive s.s.b. transmissions on the upper sideband and details of when to listen and which frequencies to monitor.

## North Atlantic

Entry from Europe into the North Atlantic is controlled by the air traffic control centre at Prestwick in Scotland. Aircraft crossing the UK from east to west, having before take off submitted a flight plan, must make contact with Prestwick before reaching 02°W confirming their flight plan requested route and estimated time of entering the Ocean Control Area. This call is made on v.h.f. 123.95MHz for aircraft registered west of 30°W and 127.65MHz for aircraft registered east of 30°W. The actual tracks that aircraft follow depend on the weather conditions in the Atlantic and are agreed and disseminated by Prestwick a.t.c.c. each day. These routes are then advised to all operators via the a.t.c. telex network (AFTN) and also broadcast from 1130 to 1900

(local) on 133.8MHz. Both Prestwick and Shannon are referred to as Shanwick Ocean Control however, all v.h.f. broadcasts are dealt with at Prestwick and all h.f. broadcasts at Shannon.

From this you will realise that control of all aircraft entering the North Atlantic is undertaken by the a.t.c.c. at Prestwick but the h.f. to and from aircraft is undertaken by radio operators at the unit near to Shannon airport in Western Ireland.

Up until a few years ago, all broadcasts were made to and from the UK with the antennas situated at Birdlip in Gloucestershire. Now the v.h.f.

transmissions are dealt with at the CAA sites in the UK and the h.f. transmissions at the Ocean Control Centre site near to Shannon airport. Communication between Prestwick and Shannon is by direct link for both voice and computer.

Every flight plan received at Prestwick having been completed with the track for the Atlantic crossing is then available at Shannon for updating as each aircraft reports its position. Aircraft having received their Ocean Track clearance continue to travel west under the control of the a.t.c. unit at West Drayton (or Scottish Airways

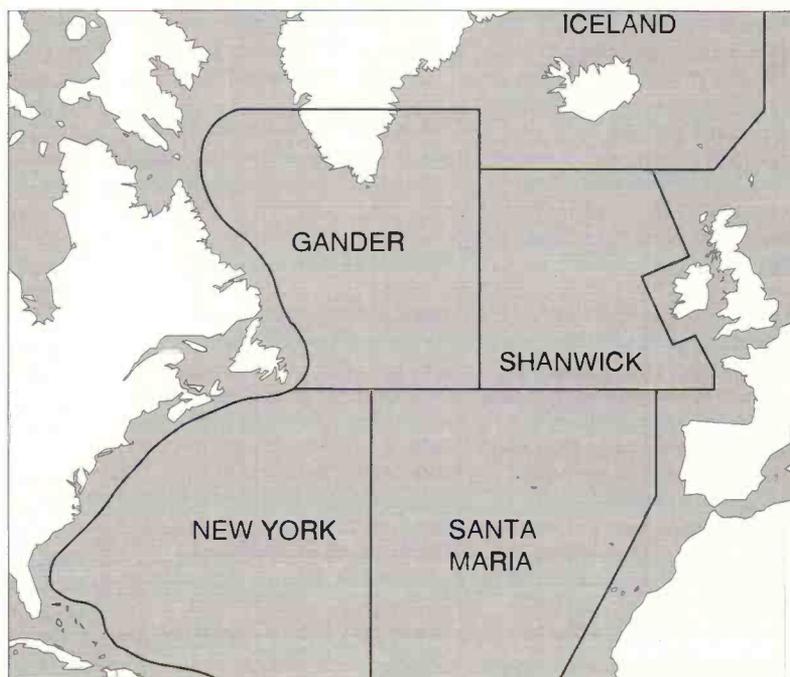


Fig. 1: The North Atlantic is split into five areas for h.f. aircraft communications.

also located at Prestwick) until they are handed over to the Irish a.t.c.c. (also at Shannon) half way across the Irish sea the transfer from UK a.t.c. to Irish a.t.c. is made transferring from 133.6 to 131.15MHz.

Depending on the track over the North Atlantic, aircraft use one of the agreed entry points situated around the UK and Ireland. The main entry points are 50°N 8°W called GAPLI; 48.5°N 12°W called OMOKO; 44°N 10°W called ACKIL and a string of entry points from 49°N to 54°N all at 15°W. The area covered by v.h.f. by Shannon a.t.c. extends out as far as 15°W due to high power v.h.f. transmitters.

A flight from London having transferred to Irish a.t.c. v.h.f. is finally handed over to Shanwick-Oceanic control before reaching the entry point so that communication can be effected and the time for the entry point confirmed. The Irish a.t.c. unit give the aircraft the primary and secondary h.f. frequencies to use.

## Frequencies

Controllers at Prestwick and the radio operators at Shannon use a range of h.f. families for communication with aircraft; these follow a simple system based on that part of the Oceanic Control Area being flown from and the origin of the aircraft. This allows a balanced loading across the frequencies which are:

| NAT A  | NAT B  | NAT C  | NAT D  | NAT E  |
|--------|--------|--------|--------|--------|
| 3.016  | 2.899  | 2.872  | 2.971  | 3.476  |
| 5.598  | 5.616  | 5.649  | 4.675  | 6.628  |
| 8.825  | 8.864  | 8.879  | 8.891  | 8.906  |
| 13.306 | 13.291 | 11.336 | 11.279 | 11.309 |
| 17.946 | 17.946 | 13.306 | 13.291 | 17.946 |
| 17.946 | 17.946 |        |        |        |

NAT A, standing for North Atlantic A, covers all southern routes for all aircraft; NAT B is for central and northern routes for aircraft registered west of 30°W; NAT C is for central and northern routes for aircraft registered east of 30°W and NAT D covers northern routes which are outside the NAT organised track system. NAT E is used in southern areas by New York and Santa Maria a.t.c.c. units only.

This means that on 5.649MHz for instance you will hear British and European

**Fig. 2: Shanwick frequency areas.**

flight crews mainly and on 5.616MHz you will hear American flight crews mainly. Fig. 2 shows these frequencies pictorially.

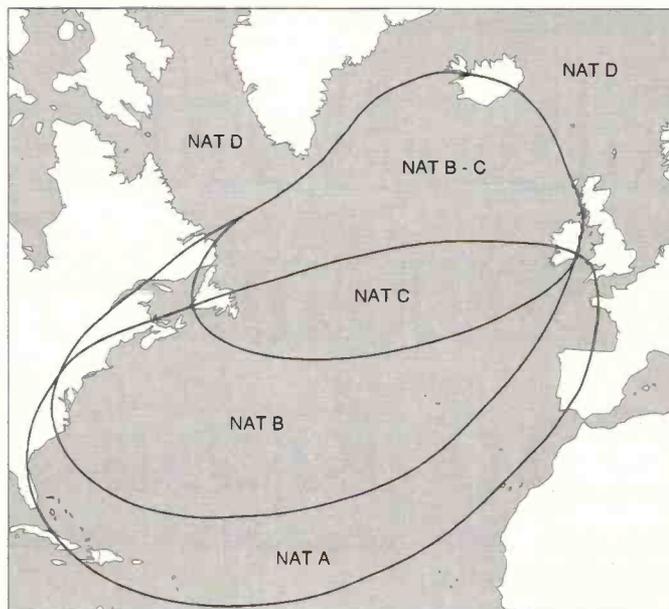
With this information and the knowledge of when aircraft actually travel across the North Atlantic we can easily see the best times to monitor the two way traffic.

Basically, aircraft travel across the Atlantic, from Europe to America from about 1000 to 1900UTC and from America to Europe from 0100 to 0800UTC. This is so that arrivals in America are during the day and departures from America can be made late in the day with arrivals in Europe early the next day; the so called red eyes specials. Keep in mind that the time difference between the UK and the eastern USA is five hours and the average flight time from London to New York is 7.5 hours and the return flight is 6.5 hours, this is because of the western jet streams bringing aircraft to Europe more quickly.

As an example take British Airways flight BA215 from Heathrow to Boston which departs LHR at 1645 and arrives in Boston at 0010 (1910 local). This aircraft return at 0200 (2100 local) arriving back at LHR at 0830. The transatlantic part of the flight is about four hours westbound and three hours eastbound from which we can expect to monitor this flight on h.f. between 1745 and 2145 outbound and 0400 and 0700 inbound. The remainder of the flight being under v.h.f. control by the UK, Eire, Canada and the USA.

## Which Frequency

As the radio operators at Shannon have to maintain contact with aircraft they do the work for us in selecting the best frequencies. Generally during daylight hours they use the 5MHz groups with the 8MHz groups in the evening and the 2MHz groups in the early morning. But, please remember, this is a general statement. Usually in the afternoon Shanwick will use 5.598, 5.616, 5.649 and 4.675MHz but as evening arrives they tend to change to 8.825, 8.864, 8.879 and



8.891MHz. In the early hours, flights are generally handed over from New York and Gander on the 5MHz group and Shanwick work the last part of the crossing on the 2MHz group.

## Who Controls What

The North Atlantic is divided into control areas which are administered by Shanwick, Iceland, Santa Maria, Gander and New York. The areas are shown on the enclosed map. As a flight nears the crossover point, the aircraft reports its position to the controlling authority with a copy to the next area authority; for example, the BA125 going west reports at 15°W to Shanwick, reports at 20°W to Shanwick with a copy to Gander and reports at 30°W to Gander Radio. A further report is made to Gander Radio at 40°W and then at 50°W the report is made to Gander a.t.c. on v.h.f. 126.9MHz.

## What is Reported

The crossing clearance previously given by a.t.c. at Prestwick, includes specific points for the flight to follow on the crossing depending on the track being flown for example; 52°N/50°W; 51°N/20°W; 50°N/30°W; 49°N/40°W; 48°N/50°W with landfall at Newfoundland. At each of these exact points a report is transmitted from the aircraft to the controlling authority radio station which consists of:

Flight reporting number,

flight level, position and time now, the position and estimated time for the next reporting point and the position for the following reporting point, followed if previously requested by a weather report.

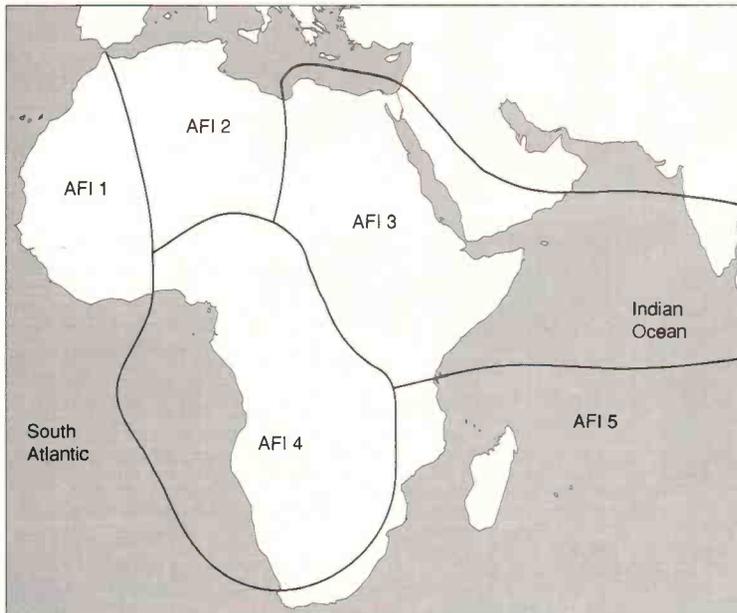
## EXAMPLE:

"Shanwick, Shanwick, this is Speedbird 215 on 5649"  
(Wait for Shanwick to reply)  
"Shanwick Speedbird 215;  
52 north is west at time 18.20, flight level 350, 51 north, 20 west at time 18.55, 50 north, 30 west next"

This is repeated back by the Shanwick radio operator and as this is the first contact between Shanwick and BA215 the Shanwick operator will ask for the SELCAL code for check. The SELCAL code is a 4-character code that this transmitted from the ground to the aircraft and upon receipt causes a bell or a gong to sound on the flight deck thus warning the flight crew to call the ground station. This alleviates the need to keep listening all the time just in case your aircraft is called.

Shanwick will transmit the SELCAL code and provided that it is received correctly, then BA215 will report "SELCAL received, SELCAL watch". The flight continues westward.

Flight levels are expressed in thousands of feet but the last two digits are omitted thus flight level 350 is 35000 (thirty five thousand). Flight levels are controlled by a.t.c. Even numbered flight levels are used westbound and odd



**Fig. 3: African flight traffic areas.**

numbers eastbound.

Within the North Atlantic all aircraft at the same flight level are kept at least 10 minutes apart. Normal separation is 1000 feet apart vertically. Above 28000 feet flight levels are separated by 2000 feet thus westbound flight levels are 310, 350, 390 and eastbound are 330, 370, 410 etc.

Should a flight wish to change flight level or speed whilst on the crossing then permission must be obtained from the controlling authority.

Having received the position report the Shanwick operator updates the specific flight plan on his computer which makes all the details available to both Prestwick and whichever other radio stations need to be known, such as New York, Gander or Santa Maria.

When weather reports are requested then at each reporting point the aircraft includes in the transmission date for wind speed and direction and outside temperature together with the same data for the mid-point.

For example travelling westwards a weather report at 40°W would include details at 40°W and at 35°W:

WIND 220 AT 55; MINUS 55  
Mid Point 200 AT 45 MINUS 47

Where the first number is the wind direction and the second is the wind speed, the minus figure is the temperature in Celsius.

### Weather for Aviators

Flight crew need weather reports so that they can operate safely and on time to their destination.

Within Europe there are many transmissions on v.h.f. giving actual weather reports and forecasts for up to 12 hours ahead. These are all called VOLMET and for the North Atlantic there are similar broadcasts.

Shannon Volmet broadcasts between the hour and 25

The RAF transmit Volmet on 4.722 and 11.200MHz continuously which again is a good guide to reception conditions. There are other volmet transmissions that can be received here in the UK, such as those from Oakland, Hong Kong, Tokyo.

### Company Traffic Reports

All airline operators like to know where their aircraft are which is easy within Europe as distances (and therefore journey times) are shorter and communications are very good.

Out over the major oceans of the world requires something extra in the way of keeping touch. The main method is (you guessed) h.f. using s.s.b., which can be used from one side of the world to the other and is used in this way every day.

Some airlines (like British Airways and KLM) have their own discrete frequencies; others use commercial radio operators like Berne ASeradio, Stockholm Radio and Portishead Radio. These broadcasts tend to be departure and arrival data of aircraft and weather information to aircraft.

### Charts and Frequency Lists

The next nearest area for us to monitor is Africa. Throughout this continent h.f. s.s.b. is used

for aircraft reporting. Each country has an air traffic control organisation but only a few have v.h.f.; Egypt and South Africa being two that do have both v.h.f. and h.f.

As for the Atlantic, Africa is divided into geographical areas for which there are agreed frequencies in use. These areas are called Africa 1, Africa 2, Africa 3, Africa 4 and Africa 5. For this purpose Africa 1 is known as AFI 1 and Africa 2 as AFI 2 and so on. A map showing the five areas is at **Fig. 3.**

The African frequencies are:

| AFI 1  | AFI 2  | AFI 3  | AFI 4  | AFI 5  |
|--------|--------|--------|--------|--------|
| 3.452  | 3.419  | 3.467  | 2.878  | 3.476  |
| 6.535  | 5.652  | 5.658  | 5.493  | 5.634  |
| 6.673  | 8.894  | 11.300 | 6.586  | 8.879  |
| 8.861  | 13.273 | 13.288 | 8.903  | 13.306 |
| 13.357 | 13.294 | 17.961 | 13.294 | 17.961 |
| 17.955 | 17.961 | 17.961 |        |        |

Additionally, the frequencies for AFI 3 and AFI 5 are also used for the Indian Ocean, so you will hear traffic to and from India.

As most countries in Africa do not have telex facilities or fax systems, flight plans are disseminated over the very same radio frequencies by the radio operators.

For example, flights from Nairobi to western Europe all leave in the late evening and their flight plans can be heard being sent from Nairobi to Addis Ababa and to Khartoum about one hour prior to the actual flight reporting in.

The best frequencies to use in the evening are 5.658MHz for some African flights and a lot of Indian flights; 11.300MHz for most of African flights from south to north via the eastern side of Africa and 8.861MHz for West Africa, particularly flights to Europe passing through the Dakar control area and the Canaries.

This then is just an outline of h.f. aircraft listening which can become a complete hobby in itself. I have heard of one person who monitors the SELCAL codes and thus knows where any individual aircraft is at any one time.

Try h.f. s.s.b. and you will be surprised at the distances from which you can hear transmissions both from the ground station and from the aircraft.

### Abbreviations

|          |   |
|----------|---|
| AFTN     | Aeronautical Fixed Telecommunications Network |
| AFI      | Africa  |
| a.t.c.   | Air Traffic Control                           |
| a.t.c.c. | Air Traffic Control Centre                    |
| E        | East  |
| h.f.     | High Frequency                                |
| LHR      | London Heathrow                               |
| MHz      | megahertz                                     |
| N        | North   |
| NAT      | North Atlantic                                |
| s.s.b.   | Single Sideband                               |
| W        | West  |

minutes past the hour with repeats from 30 minutes past the hour until 55 minutes past the hour. These transmissions are now broadcast using a digitally recorded voice that puts together the appropriate words and numbers for each location reported. Two years ago it was a real person reading the reports.

These transmissions are on 3.413, 5.505, 8.957 and 13.264MHz s.s.b. Actually, these broadcasts are a perfect

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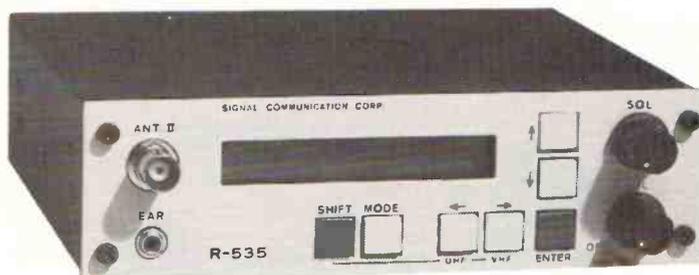
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# The Signal R-535

It is evident from readers' letters to *Short Wave Magazine*, and from the popularity of the Airband column, that one of the greatest areas of scanning interest is that of listening to the v.h.f. and u.h.f. aircraft bands. Bob Sayers reports on his long-term use of the R-535 and some modifications worth considering.



Listeners living some distance from a large city area with all its p.m.r. and other signals, or from the coast with its marine activity may hear few signals in those parts of the band. There are few places where some traffic cannot be heard on the aircraft bands. Indeed, in the case of the military u.h.f. band, it is often those most remote and unpopulated areas of the country which are the most active!

In the past, scanning receivers for the aircraft bands have generally been much of a design / performance / cost compromise. Even though the primary mode used in both of the bands is a.m., quite a number of the lower-cost hand-held receivers (normally identifiable by having a simple analogue tuning scale, with no scanning or memory features) cover the v.h.f. airband as an extension of the 88-108MHz f.m. broadcast band, leaving the user to try to receive a.m. transmissions via a f.m. discriminator. A further aspect of many so-called aircraft band receivers is their frequency coverage, or rather their lack of it. Virtually all of the models on the market only cover the v.h.f. band, which is used for navigation system transmissions (at the low-frequency end) and by civil aviation, and by light private aircraft. It is also used by military aircraft when operating in civil controlled airspace, and to a limited extent by military aircraft under military control. Most communications between military aircraft and military airfields, however, occur in the u.h.f. band.

Even scanning receivers providing a true a.m. facility may not give good results in the airbands, since the design of the a.m. circuitry, particularly

the filters, will probably be chosen for the reception of a.b. business radio, or even broadcast signals. The choice of filter in an airband receiver can be fairly critical, since in many parts of the world where aircraft travel along a designated corridor or route, the 'ground' station may in fact have quite a number of transmitter sites along the route, all operating on the same apparent frequency. To avoid mutual interference between the stations, adjacent transmitter sites have their actual frequency offset either higher or lower than their published frequency. Thus, if the local ground station to which you listen is offset, a choice of filter which is too narrow is likely to result in hearing either the aircraft or the ground station, but not both, even though both maybe quite close to you. In addition, by international agreement, aeronautical users have now adopted a 12.5kHz channel-spacing scheme. Receivers not designed to provide this bandwidth will certainly be subject to adjacent-channel interference, and in areas of high aircraft activity may well be virtually useless.

The answer to these problems, if you're serious about the airbands, may well be a dedicated airband scanner. If so, there is little better choice than the models produced by the Signal Communication Corporation, of which the R-535 is the top-of-the-range model, used by many pilots and 'professional' users as a standby receiver. Although on the market for several years now, the R-535 is still regarded by airband enthusiasts as the best scanning receiver for the job. The receiver covers only the two aircraft bands, namely

108-142.975MHz and 220-399.995MHz, and has a search facility, plus sixty memories which can be programmed with any mixture of v.h.f. and u.h.f. frequencies. Channels can be locked out, or a selected range of memories selected for scanning, as usual.

A first glance at the receiver may be quite a surprise, since it resembles no other scanner on the market. A flat, off-white front panel approximately 165 x 50mm contains, in addition to the usual volume and squelch controls and antenna and earphone sockets, a narrow i.c.d. display and seven flush push buttons, with unfamiliar labels such as left, right, up and down arrows. To anyone used to the normal scanner keypad, it is hard to believe initially that a frequency can be entered. Switching on, powers the set up in the 'manual' mode, which is a display such as 'MANU 56ch 276.050MHz' and the first impression is that the single line i.c.d. backlight in yellow, is very easy to read. On looking closer, it is possible to see that there is a cursor under the '6'. Using the up or down arrow key, changes the channel number up or down by one place, or by moving the cursor one place left first, by ten places. It is also possible to move the cursor further to the right, below the indicated frequency, and again use the up or down arrow keys to change that digit of the frequency. Once selected, the frequency can be programmed into the displayed channel by pressing 'SHIFT' and 'ENTER' simultaneously.

The 'MODE' key steps the receiver through the modes MANUAL, described above; SCAN, where a range of programmed channel numbers can be selected to be scanned

automatically (and a most important point is that the R-535 scans particularly fast - even scanning through 60 memory channels which has just been heard), and a SEARCH mode, where the first display message asks for the 'Start' frequency, the next for the 'End' frequency and the third for the frequency step size. A final press of the 'Enter' key commences searching in the usual way. When programming any memory of search frequency, the left and right arrow keys have a dual function, in that when used in conjunction with the 'Shift' key, they switch the receiver between v.h.f. and u.h.f. bands. The whole process is far more difficult to describe than to actually carry out, it is extremely convenient in practice, and certainly contributes to the neat, uncluttered and compact front panel of the R-535.

The receiver, which is approximately 133mm deep, has a top-mounted loud speaker, and is supplied with an antenna which telescopes out of the top of the case, a switch in the rear panel selecting either this antenna and a SO239 socket on the rear panel, or the BNC socket on the front panel. A car mounting bracket is also supplied, and it is most important to only use the supplied screws to fit this bracket to the receiver - internal components are very close to the mounting, and the use of longer screws will almost certainly damage these. There is a further socket on the rear panel for the 12 volt supply, and a switch to lower the intensity of the i.c.d. backlight, which can considerably increase usage time when operating from the battery supply.

# Aircraft Band Receiver

When talking of airband scanners the subject of batteries soon arises, since one of the main attractions of such a receiver is to take it along to the local airfield, particularly if there is an airshow on. The R-535 again differs from most small scanners, in that there is no provision for internal batteries of any sort. Instead, Signal Communications offer a rechargeable NiCad pack, which is the same width as the receiver itself, and bolts across the bottom of the scanner with two small supplied brackets. A soft vinyl carrying case is also available, along with a range of 110 and 240 volt power supplies, and a charger for the NiCad pack. If using the set portable, a helical whip antenna is much more convenient, and avoids damaging the supplied telescopic whip. If using a helical, however, be prepared to buy two for the two frequency bands - the writer's experience is that a helical that is efficient over the v.h.f. airband is usually almost as bad as no antenna at all on u.h.f., and vice versa! When the scanner is not being used portable, the supplied whip does an excellent job of covering the two bands, although a good external antenna mounted on a rooftop provides the extra coverage and signal strength that would be expected.

The receiver also has a port for external computer control, unfortunately requiring an additional interface to match signal levels to the required RS232 serial ports of most computers. Software for this application is also available, which enables choices of up to 60 memory channels to be stored as 'pages' in computer memory. This is a most attractive feature, since it means that the nest channels for a particular airfield or frequency-visited location can be stored in the computer, and loaded into the scanner when visiting there. On returning home, the whole 'page' of home frequencies can once again be loaded into memory. Examples of the programming commands are provided in the installation manual, making it very easy for the user who is

familiar with a language such as BASIC to produce their own control program.

## In Practice?

Here I must say that there is no quick magazine review - I have had my own R-535 for two years now, and it is in almost daily use. During the two years, I have taken the opportunity to compare its performance with a number of other airband receivers and wider-coverage scanners, and have still to find one to better it for airband use.

There are a couple of small criticisms however, although none related to the receiver itself. The soft carrying case, which most readers will regard as essential, is no 'long' enough when the receiver has the battery pack attached, and does not cover or protect the front panel of the receiver adequately, and certainly does not protect the receiver from all the rain etc., when used portable. The NiCad pack, in spite of its relative size, does not power the receiver for a particularly long time, and needs to be used with care - at an Air Show, I always power the scanner from the cigarette lighter socket whenever possible, and use the battery only when actually away from the car. When the battery pack is fitted, rapid access to the 12 volt supply socket is also lost, which is annoying if the battery suddenly goes flat! The fitting of the battery pack also prevents convenient access to the external-control port, although given the small size of the scanner, this was probably difficult to avoid.

## Sum Up?

If your scanning interests are principally airband monitoring, it is difficult to see how the choice of an R-535 can be beaten. It is compact, and offers a performance quality which is only matched by actual aircraft equipment. Many readers who are perhaps already satisfied with their own f.m. only scanner will probably be keen to add an R-535 to provide airband coverage.

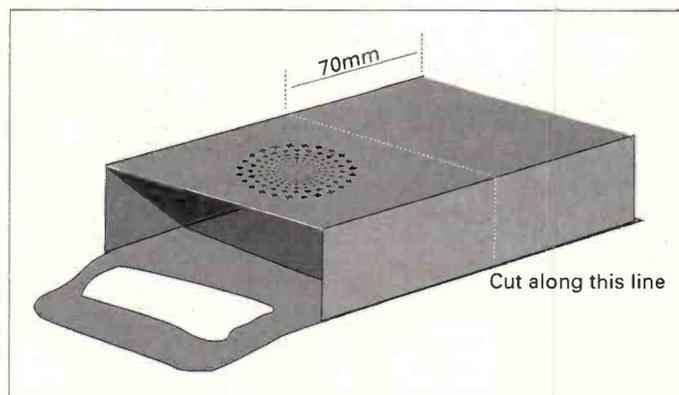


Fig. 1: Cutting the case.

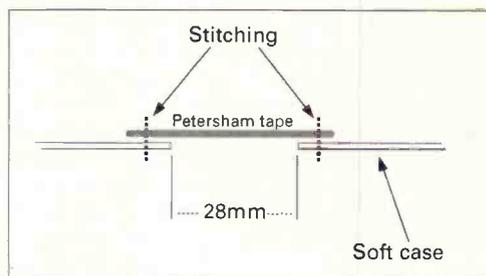


Fig. 2: Extending the case.

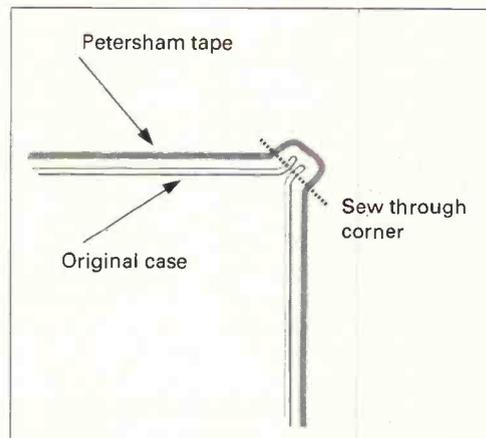
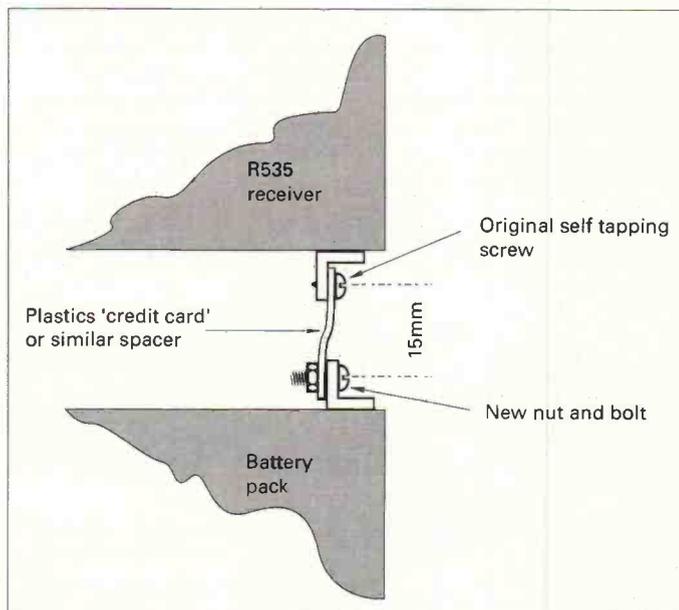
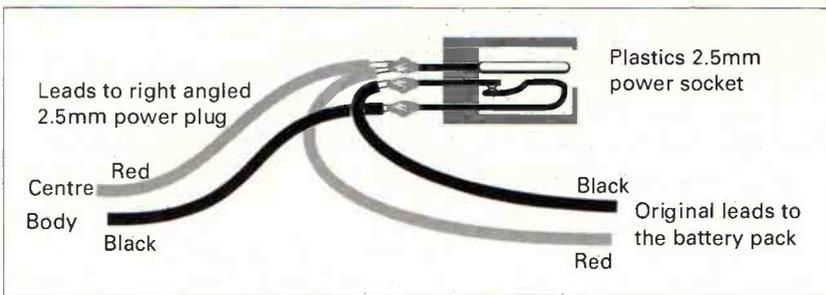


Fig. 3: Corner details.

Fig. 4: Spacer details.





**Fig. 6: Wiring the new power socket.**

## Modifications to the R-535 Airband Receiver

The Signal R-535 scanning receiver is generally thought by enthusiasts to give the best combination of size, features and performance for aircraft band only use. In spite of the high regard with which it is held, there are however a few irritating faults, although none of these relate to the receiver itself, but more to the accessories. This article shows how these faults can be almost eliminated, at virtually no cost.

### The Soft Carrying Case

The soft carrying case, which most readers will regard as essential, is not long enough when the receiver has the battery pack attached, and does not cover or protect the front panel of the receiver at all well. The case van, however be 'lengthened' fairly easily, by cutting it and inserting a strip of material, the strongest and easiest to obtain of which is fabric tape. Before starting work, however, please read this article through completely, and decide whether you wish to make the changes as described. The dimensions below assume that you will be altering the battery packets, although it is easy to re-measure if you do not wish to carry this out.

Materials required are a fairly substantial sewing needle, a reel of black thread

(not cotton) and a 500mm length of fabric tape, of a colour to match the existing case. The best tape is known as 'Petersham' which has sewn edges, and will not fray after use. It can be obtained from drapery shops or a drapery stall on a local market, in several widths, the 38mm (1.5in) wide tape being the best.

First of all, take your existing soft case, and cut it in half! The best way of doing this is to stand the receiver in it's case, upright on its end, on a table, and to measure and mark all round the case a distance of 70mm up the case (Fig. 1). Place a mark either side of this line on the inside of one side of the case, so as to ensure that the correct sides of the two halves line up once the case is put back together again. Remove the receiver, and cut carefully all round the case with a pair of sharp scissors. When sewn together again, the tape with which the case is being 'stretched' will be on the outside. Although it might be thought that adding it on the inside might be better, this would leave the two cut edges of the original case showing which would look most untidy. In any case, the receiver fits it's case so snugly that there is insufficient room to add further material inside.

Take the bottom half of the case, and starting at one of the seams between a side and the bottom of the original case, sew the tape to the cut edge of the original case, overlapping it by about 5-8mm (Figs. 2 & 3).

It is best to 'tack' all round the joint first to hold the two halves in place, and then resew it with neater stitches. There should be a continuous row of small neat stitches all round the case, in order to retain sufficient strength.

The next step is to sew the other edge of the tape to the other half of the case, again leaving an overlap. You are aiming to attach the tape so that the cut edges will end up approximately 28mm apart. Again, tack the joint first to align it and then resew with neater, stronger stitches.

The receiver can now slide carefully back into the case and if, all is well, the front panel should now sit considerably lower down in the case, so that the panel, controls and displays are protected far more.

### Rear Panel Improvements

The R-535 has a large accessory NiCad pack, unique in that it attaches to the rear edge of the receiver by small brackets. Unfortunately, this otherwise convenient idea is rather let down by the fact that once fitted, the battery pack then obscures access to the external power and computer interface connectors on the rear panel.

With very little work, this can again be improved upon. You will require four nuts and bolts of approximately 3.5mm diameter, and a small piece of scrap plastics material. My cheque card was renewed just as I was about to carry out this work, and it would be difficult to find more suitable material! You will need a 2.5mm power socket with 'cut-out' contacts, and a right angled (this is important) 2.5mm power jack to fit the receiver socket.

Undo the small screws that join the brackets on the receiver to those on the battery pack. Cut two pieces of cheque card 39mm by 29mm, and drill four small holes in them so

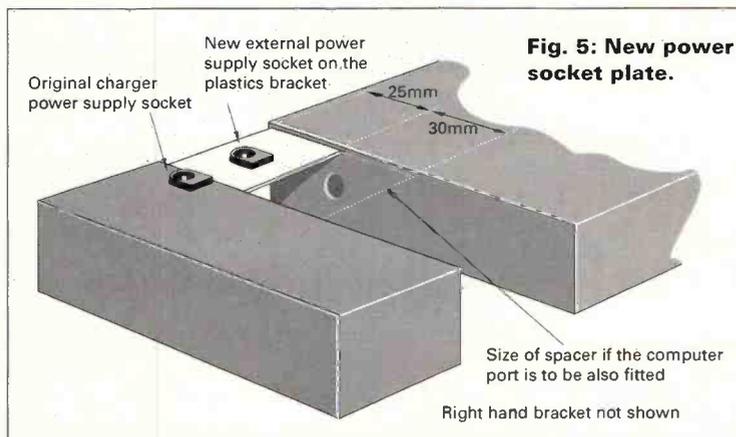
that instead of the brackets being screwed together, each bracket is now screwed to the plastics, the original holes in the brackets now being 15mm apart (Fig. 4). The original screws can be used to screw the plastics to the receiver brackets, the four new bolts holding it to those on the battery. A further small piece of plastics or metal is formed into a right-angle, and attached to the other brackets on the 'power-socket side', of the receiver (Fig. 5). This should have a hole drilled in it to mount the 2.5mm socket, so that the outside edges of the socket is flush with the similar socket in the battery pack. Wire the plug and socket as shown in Fig. 6.

If you use the computer interface socket, then the power socket bracket should be made longer, so that a larger hole can be cut in the bottom of it to accept a 5-pin DIN socket. If you can obtain a PCB-mounting DIN socket with long pins, so much the better, since these pins can then be inserted in the original DIN socket in the receiver rear panel. If not, you will have to extend the DIN connections by using a DIN plug, the body of which will probably have to be discarded due to lack of room.

The final step is to mark the positions of all the new sockets you have fitted, and carefully cut holes in the soft case (a pair of small sharp pointed scissors are ideal). Try to centre the holes over the pin of the power connectors rather than the whole body, so that you can cut the smallest possible hole to insert the plug.

### Availability?

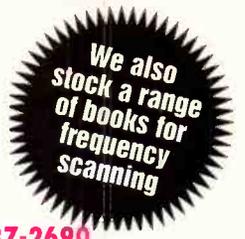
I must thank Lowe Electronics of Chesterfield Road, Matlock, Derbyshire DE4 5LE for providing both my own R-535 and also the additional information for this review. ■



**Fig. 5: New power socket plate.**

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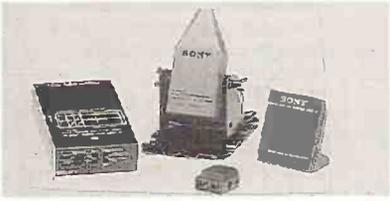
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Antennas fitted to most airband scanners are, at best, a compromise between electrical performance and convenience of use. Peter Hirons G1CEI, looks at a cost effective way of improving the reception when home based.

# C M Howes Communications AB118 Active Airband Antenna Kit

## The Problem

The smallest passive antenna that is electrically efficient is one quarter wavelength ( $\lambda/4$ ) long. Unfortunately, even a  $\lambda/4$  antenna for airband is around 600mm long - too long to be safely used with a hand-held receiver. Manufacturers are aware of the inconvenience factor and therefore fit most portable receivers with the well-known 'rubber duck' type of antenna which is, at best, a compromise with inferior performance to that of a  $\lambda/4$ .

The lesser sensitivity will not be a problem when using the radio outdoors close to airfields with relatively strong signals around. It is when we want to monitor airband signals indoors from home that the lack of sensitivity becomes noticeable.



**Fig. 2: The small centre antenna p.c.b.**



**Fig. 3: The amplifier stage. For external use heat-shrink sleeving should be used to seal the end of the coaxial cable.**



**Fig. 4: Power coupler and switched attenuator.**

## The Solution

As with domestic Band 2 radios and televisions in poor reception areas, one solution is to use an external antenna, mounted as high as possible. This requires a long length of coaxial cable, resulting in signal loss and noise pick-up. Amplifying at the receiver end of the cable also amplifies the noise, often resulting in little apparent improvement. Amplify the signal at the antenna, so that by the time it reaches the receiver there is still a significant improvement, is the answer to the problem.

## What You Get

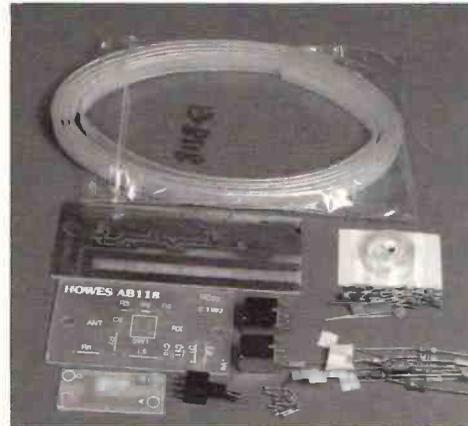
The Howes Communications AB118 Active Antenna kit covers the v.h.f. airband and gives a useful gain across the band. The circuit consists of a single-stage mast-head amplifier, using a high gain integrated circuit. Power is fed up the coaxial cable. The antenna is the well-known J-pole configuration constructed from a length of 300 $\Omega$  ribbon-cable (provided in the kit).

The kit contains three circuit boards, although one only needs four pins soldering in. The next board contains the active amplifier and is directly attached to the bottom of the antenna. The third board contains decoupling circuits and the switched attenuator.

You will need to provide two lengths of coaxial cable - one to go from the antenna to the control board and one from the control board to your receiver, together with a suitable connector. Two lengths of wire and a power source are also required. For a permanent installation the instructions suggest mounting the antenna inside a 2m length of 40mm diameter plastic waste water pipe.

## Construction

The components come neatly packed and checked out correctly. The well-presented and



**Fig. 1: The complete contents of the kit. The square white pot contains the integrated circuit.**

clear instructions were followed with no problems, although identifying the 0.125W resistors might prove difficult for those with less than perfect eyesight. Some of the solder pads were quite small and a soldering iron with a tip of no more than 3mm diameter is essential.

The only minor problem came when trying to solder the coaxial cable to the modules. The braid needed a larger soldering iron than could be used for the rest of the kit (I used a 60W temperature-controlled one for this) and the inner was extremely springy!

I would have liked terminal pins for the power connectors, rather than soldering the wires directly onto the pads, but this is not a serious problem.

## Performance

It was not possible to measure the gain of the unit exactly, however using the S-meter on a Yupiteru VT-125 II airband receiver showed a significant increase in signal. As a test, with the power disconnected, I shorted the input to the output and noted the signal level reading. Looking at the increase in level with the shorting link removed and power applied, and comparing this with the change in level when the 10dB attenuator was switched in or

out would indicate at least 15dB of gain.

On air from my home near Winchester the antenna pulled in many signals from aircraft using Southampton and Bournemouth airports, plus some that I expect were routed in or out of Heathrow. While just letting the receiver scan through the end of band I also received an extremely strong signal in the 137MHz weather satellite band for a few minutes, obviously one of the 'birds' passing over.

## Conclusions

I would have no hesitation in recommending this kit to anyone able to solder reasonably well. Those who cannot, or do not wish to, undertake construction of the complete kit can buy the circuit boards ready assembled, only requiring the cables fitting. If the antenna was finished as recommended by placing it inside a length of drain pipe and mounted as high as possible then some quite remarkable results should be achievable.

Thanks go to **C. M. Howes Communications, Eydon, Daventry, Northants NN11 6PT. Tel:(0327) 60178** for providing the sample kit and to **Nevada Communications, 189 London Road, North End, Portsmouth, Hants PO2 9AE Tel:(0705) 662145**, for the loan of the receiver. ■

## Specifications

|                                |  |
|--------------------------------|--|
| Frequency Range:               | 118 to 137MHz                                    |
| Gain:                          | $\geq 15\text{dB} \pm 2\text{dB}$ over the range |
| Noise Figure:                  | $< 3\text{dB}$                                   |
| 3rd Order Intercept:           | +15dBm   |
| Attenuator:                    | Nominal 10dB switched                            |
| Power requirement:             | 12 - 14V d.c. @ $< 20\text{mA}$                  |
| Price (kit):                   | £18.80   |
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# Flying: What Do th

**Listening to the way pilots and controllers talk to each other by radio is confusing. Most of what they say seems to be coded as numbers! Godfrey Manning G4GLM hopes that, by the end of this article, it will all make sense to you.**

You need no longer be bewildered by an exchange such as, "Speedbird 457, 25 miles to run, descend 3000 on 1012, report passing 40," answered by "457 leaving 60 for 3000 on 1012." The easiest way to get to grips with any subject is to break it down into sections, so here goes. Ready for departure?

## Callsigns

The firm, clipped, experienced pilot's voice seems to become a habit that even affects their everyday speech if you listen carefully. In the same way that an accent can give away someone's origin, the subtle intonation with which pilots speak often makes them identifiable if you know what you're listening for. This comes about from the need to speak information accurately and concisely. On v.h.f. or u.h.f. the clear channels allow quite rapid speech to remain intelligible but h.f. is subject to interference and fading.

To make things easier, pilots worldwide use the same phonetic alphabet that radio amateurs are supposed to. The 26 letters of the alphabet are each represented by a word that

begins with that letter (Alpha, Bravo, Charlie, Delta, Echo, Foxtrot, Golf, Hotel, India, Juliet, Kilo, Lima, Mike, November, Oscar, Papa, Quebec, Romeo, Sierra, Tango, Uniform, Victor, Whiskey, X-ray, Yankee, Zulu). "SWM" would be spoken as "Sierra Whiskey Mike." The words are more distinct than individual letters (try distinguishing "B" from "D" over the telephone!) and there are only 26 to choose from if clarity is poor. The intention was that these words remain distinct regardless of the speaker's accent.

When contacting a controller, the flight identifies itself by call sign. The registration would be simple enough, e.g. G-ASWM becoming "Golf Alpha Sierra Whiskey Mike" (no dash) or, when no confusion could arise, "Golf Whiskey Mike." Commercial and military flights are likely to have dedicated call signs; Midland 294 is obviously a British Midland flight but Speedbird stands for British Airways, Shamrock for Aer Lingus, and there are other special cases. One cause of numbers is if the Midland flight just said "294" when answering that the controller had been received and understood.

Another requirement is for the pilot never to say "Yes" or "No" (rather like a quiz game on TV many years ago) but instead to answer "Affirmative" or "Negative" (please, not the American "Affirm" - "A" as in "Hay").

## Frequencies

Numbers also receive a little help. They are spoken as individual digits (the Americans transgress here) with the word "Decimal"

indicating a decimal point. The pronunciation is exaggerated thus: Wun, Too, Tree, Fower, Fife, Six, Seven, Ait, Niner, Ze-Ro, Tausend. The emergency frequency is thus "Wun Too Wun Decimal Wun Fife" and nobody says "Megahertz" because they all know that's what they mean.

So immediately we come to our next number: the frequency of a radio station. When the controller says to "Call" or "Contact" someone on a number, then the pilot tunes the aircraft's communication radio to the given frequency. Readers of *SWM* will be familiar with this concept, as it's the same frequency that you would select on any radio set. Basically, the frequency ensures that the particular station as required is tuned in rather than some other unwanted station.

## Squawk

Modern (secondary surveillance) radar is enhanced by receiving a signal from the aircraft's transponder. The radar sends out an interrogation pulse, and then switches to receive; if a transponding aircraft is in the line of the pulse's direction of travel, then it transmits a reply which appears on the radar screen.

Two numbers are coded in the reply: a four-digit identification (squawk) and the altitude. When a controller says "Squawk 4212" the pilot sets this code on the transponder; the code then appears alongside the correct target on the radar screen, and the controller is now sure which target belongs to which aircraft. To make really sure, the aircraft can "Squawk ident" in which case, in response to

pressing a button in the cockpit, the radar image of that aircraft briefly flashes.

## Where Am I?

Two numerical values help when establishing position and they are distance and bearing. Distance is easily quoted as so many miles (actually nautical miles where 1nm is now internationally defined as 1852m) from a particular geographical place, reporting point or beacon. During a radar approach, the distance to touchdown will not be along a straight line but the controller can nevertheless estimate it when watching the plan view on a radar screen.

Bearings are in degrees, familiar from the protractor you were made to use in school geometry lessons. A complete circle is divided into 360° but in our case there is one other thing to remember. Our "protractor" is always set with the 0° line pointing to magnetic North (so that makes due East at 90° from the centre of the protractor). The idea is to imagine a map, with the protractor placed on top. The centre of the protractor is placed at a fixed point (perhaps a beacon); 0° is pointed due North; and then a line is imagined from the centre of the protractor to the position of the aircraft. Where that line crosses the curved outer edge of the protractor, the bearing of the aircraft from the fixed point can be read off. Beacons that do this automatically are called v.o.r.s and in this case the bearing line on which the aircraft lies is called a radial.

You could also place the centre of the protractor at the aircraft's position and rule an imaginary line along the length of the

# he Numbers Mean?

aircraft's fuselage; keep drawing this line until it crosses the curved outer edge of the protractor. This angle is the heading of the aircraft - i.e. which way (in degrees) the nose is pointing relative to North. Is the aircraft pointing to the South? Then the heading will be 180°.

## Altitude

A typical report to Air Traffic Control consists of callsign, position, heading and altitude. So if I say "Shortwave 168, 25 miles to go to the Bovingdon beacon, heading 140, 2000 feet on 997" you will now understand all but the last bit. Altitudes require two separate numbers: what the altimeter actually reads (2000 feet in this case) and what it is set to (997).

It surprises people that an altimeter needs setting at all. Visitors to my Museum are horrified when I hand them an altimeter, initially reading zero, and then change the reading just by turning a knob. And their feet didn't leave the ground! The trouble with altimeters is that they aren't - they're not able to measure altitude. Instead, they measure the air pressure outside the aircraft and convert this to altitude. We can get away with this trick because pressure varies with altitude in a known way; for example, climbing from sea level (zero altitude) to 18000ft halves the pressure.

The next problem with air pressure is that it changes slowly according to the weather. Put an altimeter on your desk and watch it change its reading over several days - just like a barometer. That's because it really IS a barometer! To set an altimeter correctly requires

reference to a barometer as part of the pre-flight checks. The controller will give you a QFE barometer reading (spoken, of course, as "Quebec Foxtrot Echo") which is an aeronautical shorthand recognised internationally. Set this (e.g. "QFE 997") on the altimeter and it will read zero when parked on the apron - or it will read height above aerodrome whilst in flight (such as on final approach). The number is in millibars (mB); 1000mB = 1 bar = the pressure due to the weight of the atmosphere as found at sea level (= 29.53in Hg).

QNH is more useful, because when set on the altimeter it provides a reading of height above sea level (true altitude). Looking at a map, the nearest mountain-top is also shown with its height above sea level; so now you know if you have sufficient altitude to fly over it rather than crash into it!

At great altitudes (over most of the UK, 3000ft is enough) precise altitude doesn't matter. Flights up here are too high to be bothered by the underlying terrain. What really matters is that aircraft don't crash into each other. If I'm at 5000ft, and you are coming towards me at 6000ft, I'll pass beneath you with a safe 1000ft vertical separation. Unless, of course, one of us has set our altimeter wrongly in which case we might unwittingly be on collision course! Above the 3000ft transition altitude, everyone sets the same on their altimeter so as to prevent this from happening and that something is 1013.25mB (which everybody forgets is called the QNE). Other countries now talk about hectopascals which sounds

rather grand if not confusing; don't worry, these are exactly the same as mB. The only really different ones are - you guessed it - the Americans who set their pressures in inches of mercury (in Hg), the standard setting 1013.25mB being the same as 29.92in Hg. Whichever is set, we no longer talk about height or altitude: instead we round the altimeter reading to the nearest hundred feet and express the flight level (FL). So 24500ft is actually FL245 (or, if you prefer, 245 hundreds of feet).

When no ambiguity arises, pilots often cut corners by saying "Passing 90 for 60" meaning descending through FL90, on the way to the required flight level of FL60. Strictly, this is slack as the pilot should explicitly say "Flight level" where appropriate.

## Airspeed

I know what you're thinking. This is going to be an easy one: it tells me the speed of the aircraft just like a speedometer tells me the same about my car. Sorry to disappoint you: wrong! Airspeed indicators display, would you believe, indicated airspeed. This is measured in knots (nautical miles per hour). The reading is produced by the headlong rush of the aircraft through the air. The faster the aircraft goes, the more the air is rammed down a forward-facing blind-ended tube (called a Pitot head). More ramming causes more pressure in the tube, so the airspeed indicator is in fact another sort of pressure meter!

Indicated airspeed tells us how much effect the headlong rush through the air is having on our aircraft. Too fast, and the airstream will pull bits off the

airframe. Particularly vulnerable are the undercarriage and flaps, but in extreme cases the wings or tail surfaces can be pulled apart! Close to the ground, indicated airspeed is a good estimate of actual speed through the air (true airspeed). High up, the air is thinner and has less effect for the same true airspeed. True can be calculated from indicated if the altitude and outside air temperature are known (this latter is measured in degrees Celsius). Unfortunately, the air through which you are flying is itself on the move (it's called wind). Speed through the air may be quite different to speed over the ground.

Radar controllers see the movement of the aircraft over the ground, but there's no point in telling the pilot what groundspeed to aim for - there usually isn't a cockpit instrument that displays this! Instead, the controller will suggest an airspeed (and heading) and waits to see what happens to the movement of the aircraft relative to the ground. This gives a clue as to further alterations in airspeed and heading.

Now look back to the beginning of this article to see if it makes more sense now. If you have any questions, I would be delighted to answer them through my regular *Airband* column, which you will find elsewhere in this magazine. ■

## Abbreviations

|        |  |
|--------|--|
| ft     | feet   |
| h.f.   | high frequency   |
| m      | metres   |
| nm     | nautical miles   |
| u.h.f. | ultra high frequency                                   |
| v.h.f. | very high frequency                                    |
| v.o.r. | very high frequency<br>omni-directional<br>radio range |

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# Monitoring the Space Shuttle

Every time there is a Space Shuttle mission, the SWM office receives a number of calls asking for information on how to receive the communications between the Shuttle and Mission Control. Keith Mellor has submitted this article which should answer all your questions.

Short wave listeners who have a receiver with single sideband (s.s.b.) capability can share in the excitement and fascination of the Space Shuttle missions, through listening to the relay of the Shuttle and Mission Control audio by WA3NAN. This is the amateur radio station of the Goddard Amateur Radio Club (GARC) run by employees of the Goddard Space Flight Centre in Maryland, USA.

The relay of the communications begins approximately one hour before launch and apart from the occasional breaks, continues right through to the landing of the Shuttle.

You can hear all of the action as it happens, with a NASA official at Mission Control, Houston, providing explanations and additional information. It can be fascinating to listen to the astronauts as they carry out their work, such as deploying a satellite or performing experiment. Sometimes they can be heard describing their view of the Earth, the countries

they are passing over and the location of electrical storms.

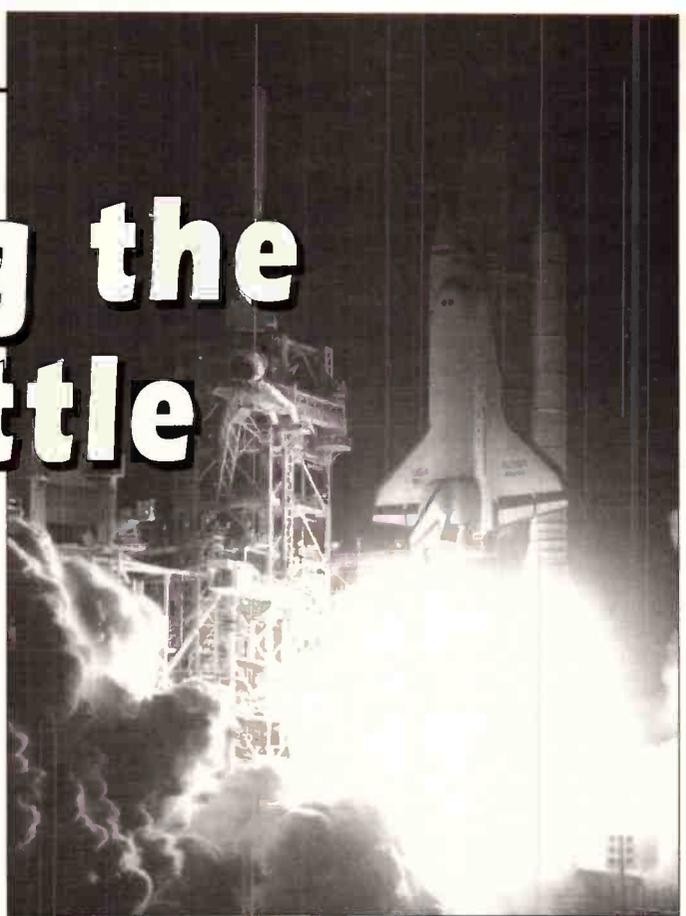
For full information on imminent Shuttle flights it is wise to monitor the news bulletins and Magazine Show programmes of the Voice of America, especially in order to be forewarned of the actual date and time of the next launch. *Spaceflight* magazine produced by the British Interplanetary Society is also a useful source of information.

## Pre-Launch Preparation

Your listening enjoyment can be increased by setting up a 'mission monitoring station' in your radio shack. The walls can be adorned with suitable space pictures, especially of the Space Shuttle itself, to create the right atmosphere and to provide visual aids to the full appreciation of the events taking place. Otherwise, books containing space photographs, perhaps from your local library, can be displayed.

Excellent NASA photographs and information brochures are sent free on request from the Kennedy Space Centre and Johnson Space Centre, addresses are given later.

If your receiver has memories then it is helpful to enter the relevant frequencies for quick recall and scanning, or at least have a frequency list readily available. WA3NAN transmits in upper sideband (u.s.b.) on a maximum of four of the following frequencies: 3.860, 7.185, 14.295, 21.395 or 28.650MHz. The 14 and 21MHz frequencies are usually the easiest to hear. A NASA Shuttle audio relay can sometimes be heard on one of 20.816, 20.189, 20.192, 20.198, 20.380 or 20.390MHz. Usually, transmissions are in lower sideband (l.s.b.) and the most



recently active frequency was 20.198MHz (l.s.b.).

If you have two receivers, then whilst one is used to monitor WA3NAN, the other can be used to check for activity on the many NASA frequencies which are used for launch support ships and tracking stations. Listings of these frequencies can be found in several books dealing with utility listening.

Since various time standards can be quoted by Mission Control and others, it is useful to have a world time conversion chart and even to have two clocks in your radio shack. One time can be set to Universal Co-ordinated Time (UTC or GMT) whilst the other shows the Eastern Standard Time (EST) which is UTC minus five hours. Central Standard Time (CST) is UTC minus six hours. During the summer months remember to add the extra 'daylight saving' hour, so that EST becomes Eastern Daylight Time (EDT), which is UTC minus four hours.

Mission Elapsed Time (MET) is often quoted. A stopwatch which is started at the moment of lift-off and kept running throughout the mission will enable you to accurately follow the MET. If the stopwatch has a countdown function then the pre-launch 'T-minus' counting can be closely followed, but beware of the built-in holds,

shown in **Table 1**.

Although Table 1 lists the main sequence of events during countdown and launch, by listening carefully and making notes it is possible to construct your own more detailed chart for guidance during future launches.

Have a tape recorder and plenty of blank tapes ready for recording the Shuttle audio transmissions. Later, the best moments can be copied onto other tapes and kept for future enjoyment.

It is a good idea to keep a special notebook in which to record details of future Shuttle missions, such as payloads, crew members names and any other pertinent details. Such notes will also aid in understanding the Shuttle communications. A list of NASA acronyms is another handy item.

If you wish to record the full details of the Shuttle's ascent into orbit then have prepared a logsheet consisting of six columns headed respectively - MET; Event; Velocity; Altitude; Downrange Distance; Other Details.

Once your Shuttle monitoring station is set up you are ready for launch - just hope that there is no delay due to bad weather or technical problems, and that propagation conditions are favourable for you!

Tune to the frequencies of WA3NAN at least one hour

before the scheduled launch time and also check the NASA frequencies given previously.

During lulls in the activity it is interesting to review such data as Shuttle specifications. Here are a few basic facts: the Space Shuttle is a reusable orbiter with a planned life of at least 100 missions. The Shuttle is about the size of a DC-9 commercial jetliner, being 56m (184ft) long, 23m (76ft) high to the tip of its vertical tail and 24m (78ft) wide measured across its wingtips. Weight at lift-off is around 2.04 thousand tonnes (4.5 million pounds).

Launches are from Launch Complex 39 of the Kennedy Space Centre located on Merritt Island, Florida. A standard 43-hour countdown (with built-in holes) begins three days before the launch.

At lift-off the Shuttle's three main liquid-fuelled engines receive propellants from the expendable external tank, burning simultaneously with the two external solid-propellant rocket boosters (SRBs), providing a total thrust of around 31 million Newtons (7 million pounds).

When the Shuttle reaches an altitude of about 48km (31 miles) the two SRBs detach

code at regular intervals, which provides a useful indication that they are actually on the air. The GARC members are to be congratulated for the excellent service they provide for space enthusiasts. They welcome letters and listener reports are verified with a QSL card.

Occasionally, the amateur radio clubs other than NASA Centres also relay the Shuttle audio on short wave. So, it is worth checking for the Johnson Space Centre in Texas and the Jet Propulsion Laboratory in California on 3.840, 14.280, 21.280, 21.350 or 28.495MHz.

Many of the astronauts have amateur radio licences and during several missions have been heard contacting ground-based amateurs as well as cosmonauts aboard the Russian MIR space station. Such activity is called SAREX (Shuttle Amateur Radio Experiment) and the primary downlink frequency to monitor is 145.550MHz (narrowband f.m.). Sometimes, slow-scan TV and packet radio are also used.

Unfortunately, these v.h.f. amateur space transmission can only be heard in the UK when the Shuttle is in a high inclination orbit of around 57°, whereas most flights have a

nominal orbit inclination of 28.5°.

The AMSAT nets are a good source of information regarding SAREX activity. Listen on Mondays and Wednesdays at 1900 local time on 3.780MHz, Saturday at 1000 local on 14.280MHz and Sundays at 1015 local on 3.780MHz.

If you have an orbital prediction programmed for your computer then it is possible to track the Shuttle using the Keplerian Elements which are transmitted periodically by WA3NAN.

### Shuttle Landing

Although not quite as exciting as the launch, the landing of the Space Shuttle can provide much listening enjoyment. It is best to tune-in at least one and a half hours before the landing

**Table 1. Space Shuttle Launch Sequence**

| Time         | Event  |
|--------------|--|
| T-5:00:00    | Begin Final Countdown  |
| T-1:50:00    | Astronauts enter orbiter   |
| T-0:30:00    | Ground crew retires to fall back area  |
| T-0:25:00    | Voice check  |
| T-0:20:00    | 10 minute hold (countdown clocks stopped to allow catch-up on any behind-schedule activities.) |
| T-0:16:00    | Main Propulsion System (MPS) helium pressurisation.  |
| T-0:09:00    | 10 minute hold (allows one last chance to catch up)  |
| T-0:05:00    | Auxiliary Power Units (APUs) start   |
| T-0:03:00    | Orbiter main engines gimbals to their launch positions   |
| T-0:2:55     | External Tank Oxygen vents close the liquid oxygen tank begins pressurising                    |
| T-0:00:25    | Solid Rocket Booster APUs start  |
| T-0:00:03.46 | 1st Space Shuttle Main Engine (SSME) ignites   |
| T-0:00:03.34 | 2nd SSME ignites   |
| T-0:00:03.22 | 3rd SSME ignites   |
| T-0:00:02.64 | Solid Rocket Boosters ignite   |
| T-0:00:03    | LIFT OFF!  |
| T+0:02:00    | Solid Rocket Boosters burnout  |
| T+0:02:07    | SRB Separation   |
| T+0:04:20    | Negative return call from Mission Control  |
| T+0:06:30    | Shuttle begins a long shallow dive to prepare for External Tank separation                     |
| T+0:08:38    | Main engine cut-off (MECO)   |
| T+0:08:54    | External Tank Separation   |
| T+0:46:34    | Orbit achieved   |

*Times are Takeoff ± h:mm:ss (hours:minutes:seconds)*

**Table 2. Space Shuttle Landing Sequence**

| Time      | Event   |
|-----------|---|
| L-2:00:00 | Astronauts return to their seats for landing preparation              |
| L-1:24:00 | APU prestart  |
| L-1:17:00 | Go/no-go decision from Mission Control for deorbit, entry and landing |
| L-1:15:00 | Manoeuvre to deorbit burn attitude (so is flying tail first)          |
| L-1:00:00 | Deorbit burn (lasts 2 - 3 minutes)                                    |
| L-0:30:00 | Atmospheric Entry begins  |
| L-0:25:00 | Communications blackout starts  |
| L-0:12:00 | Communications blackout ends  |
| L-0:02:00 | Autoland guidance begins  |
| L-0:00:00 | TOUCHDOWN!  |
| L+0:01:17 | Orbiter stop  |
| L+0:27:00 | Astronauts leave the orbiter  |

*Times are Landing ± h:mm:ss (hours:minutes:seconds)*

in order not to miss any of the action. If necessary listen to the news broadcasts of the Voice of America to learn of the scheduled landing time.

It is helpful to have available a chart showing the sequence of events during the landing. **Table 2** lists the main events but it will be useful to make noted whilst monitoring in order to be able to prepare your own more detailed chart for future reference.

For recording the full details of the Shuttle's descent from orbit, it is handy to have a prepared log sheet consisting of seven columns headed respectively - MET; Event; Altitude; Velocity; Range to Runway; Rate of Descent; and lastly, Other Details.

The Shuttle can land at Edwards Airforce Base, California, Kennedy Space Centre (KSC) or White Sands, New Mexico. KSC's landing facility consists of a runway 4.6km (15000 feet) long, 91m (300 feet) wide and 400mm (16 inches) thick at the centre. Runway 15 is oriented north west to south east and Runway 33 is the reverse direction. After the deorbit burn the Shuttle must make an unpowered descent, gliding

into a perfect landing first time. The speed at touchdown is between 343 to 364km/h (213 and 226 miles per hour).

As there is a Shuttle flight planned for virtually every month, there is plenty of good listening to look forward to. Check Lawrence Harris 'Info in Orbit' section for the latest flight dates. With NASA's space station *Freedom* project on schedule and assembly in space due to begin in 1995, space monitoring can only become even more exciting in the future.

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and parachute into the ocean, to be recovered and refurbished for reuse. Shortly before achieving orbit, the Shuttle's main engines cut off and the external tank is jettisoned to break up over a remote ocean area.

Propagation conditions permitting, the Shuttle voice communications can be monitored throughout the mission, apart from breaks in transmission due to the astronauts sleep schedule or Shuttle-to-ground communications blackout periods, which can last up to 30 minutes. Also, remember that the amateur station WA3NAN is manned by volunteers and so cannot guarantee continuous coverage.

Besides voice announcements, the callsign WA3NAN is sent in Morse

### Useful Addresses

**WA3NAN, Goddard Amateur Radio Club, PO Box 86, Greenbelt, Maryland, 20771, USA.**

**The British Interplanetary Society, 27/29 South Lambeth Road, London SW8 1SZ**

**Educational Programmes and Services, Kennedy Space Centre, Florida, 32899, USA.**

**Lyndon B Johnson Space Centre, Houston, Texas, 77058, USA.**

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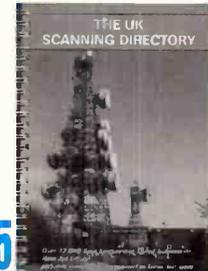
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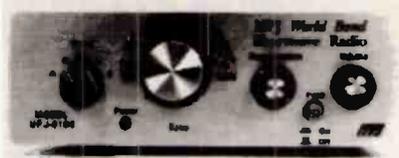
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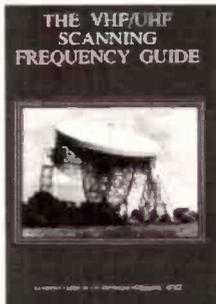


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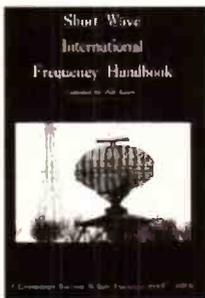
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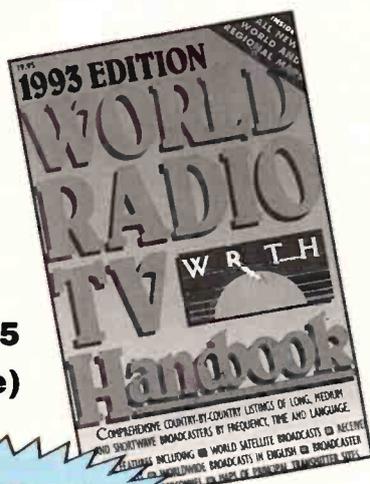
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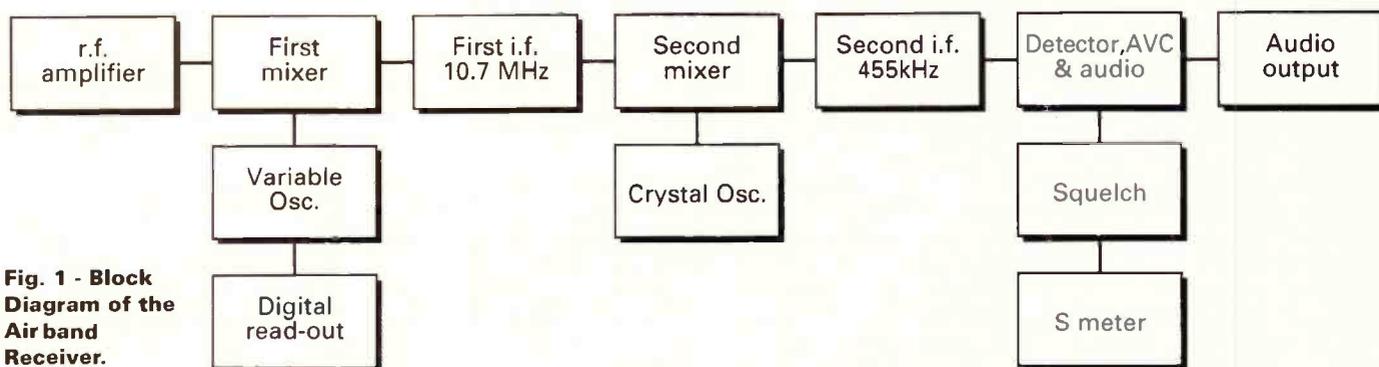
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# Building a Valved Airband Receiver

Many modern scanners do not allow free tuning across the Airband or direct display of the frequency. Ray Loveland G2ARU describes his solution to the problem.



**Fig. 1 - Block Diagram of the Air band Receiver.**

## The Problem

Airband listening is one of my many radio interests. As listeners with a similar interest will know, it is often necessary to change channel quickly to follow the progress of a particular flight from one sector to another when the aircraft is given a different frequency to call on. I have two different means of receiving airband transmissions here and on neither of these is it always possible to change channel quickly enough. One is a FRG7700 communication receiver with the FRV7700 converter and the other a realistic PRO2005 scanning receiver. Once the FRG7700-FRV7700 is set up, it is necessary to change waveband on the receiver, peak up the r.f. tuning on the converter and perhaps change band also on the converter. In the case of the PRO2005 it is necessary either to look up the channel number of the required frequency if it has been programmed into the scanner or to enter it if it is not in the memory. All of this takes time and often

transmission from the aircraft on the new frequency has been made before the channel has been tuned in.

## The Solution

There appeared to be only one solution to the problem of rapid frequency change and that would be to acquire a variable tuned receiver which would cover the entire airband with one swing of the dial. I therefore decided to build such a receiver and, as I am a dedicated valve enthusiast, it had to be a valved receiver. Some thought was given to the project and it seemed that a double superhet would be essential to improve on the second-channel problems and also to have better selectivity than the portable receivers using only a single 10.7MHz i.f. Also it would have to incorporate digital read-out to be of any real use.

The receiver does not have to be a particularly complicated nor does it need to have an excessive amount of gain. My finished receiver consists of r.f. amplifier, first mixer (variable oscillator), one i.f. amplifier at 10.7MHz,

second mixer (crystal oscillator), one i.f. stage at 455kHz, detector and audio stages as shown in the block diagram in **Fig. 1**.

This article is intended to encourage experienced valve minded constructors to have a go at building a similar receiver. I can assure them that the effort is well worth while and that excellent results can be obtained. No originality is claimed for any of the circuits used in the receiver as all are tried and tested circuits used in many published designs. There would be no point in providing a detailed description of my finished receiver as it contains many components which are no longer available. I hope that the following notes will be of some help to any like-minded experienced constructors undertaking a similar project who hopefully would have many suitable parts already of hand.

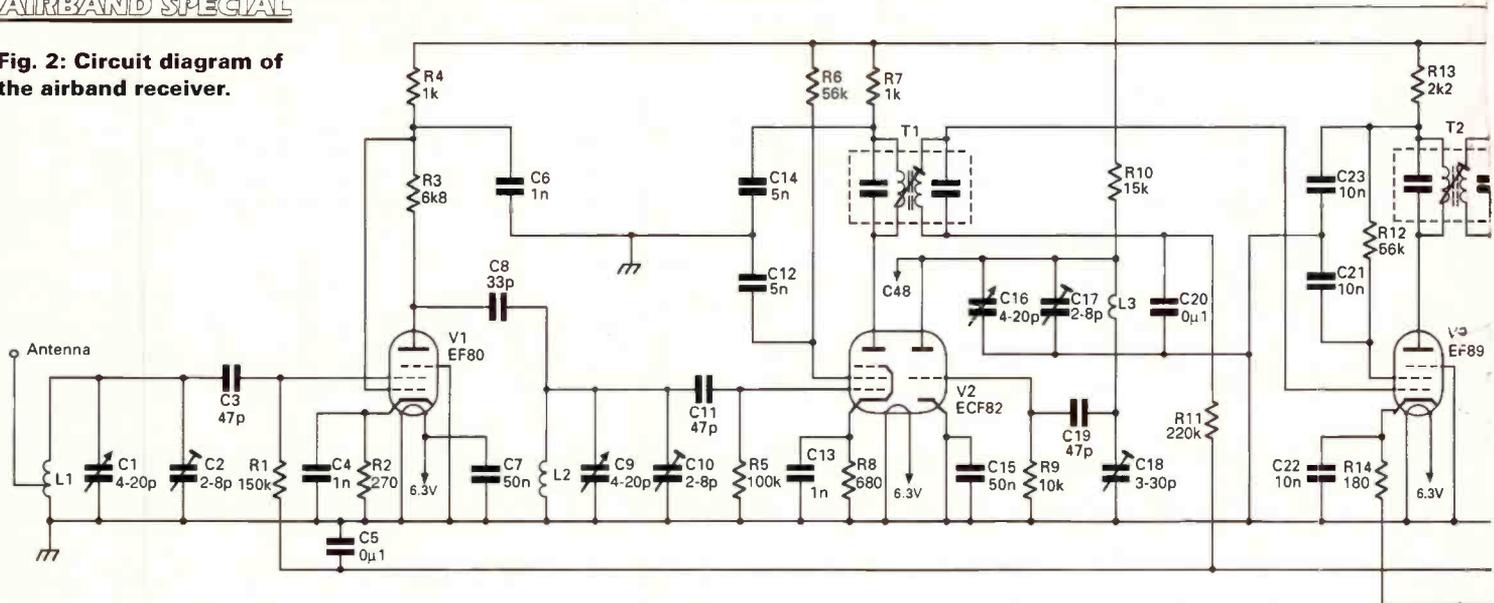
The circuit diagram of one version of my receiver is shown in **Fig. 2** but some variations have been tried and these are discussed in the following paragraphs.

## First Mixer and R.F. Amplifier

The first mixer is really the heart of the receiver and warrants particular attention. I have tried two circuits: a pentode mixer with triode oscillator using the ECF82 valve and a double triode with the 12AT7. Both seem familiar in performance as a mixer but the pentode has better gain with consequent reduction in noise level and I favour this arrangement. In each case I used the triode in an ultra-audion circuit. This oscillator works satisfactorily over a wide range of operating conditions and has the advantage of only requiring a single un-tapped coil.

The tuning capacitor needs to have a maximum capacity of around 20pF to cover the required tuning range of 118 to 136MHz but can of course be a bit larger if that is all that is available. The effective capacity can be reduced by using a fixed capacitor in series. It must be appreciated that in the ultra-audion circuit the capacitor from grid to earth (C18) is actually in series with the tuning capacitor and can

**Fig. 2: Circuit diagram of the airband receiver.**



be varied to get the required oscillator coverage. It is a good idea to make this capacitor variable to enable the frequency coverage to be adjusted. I used a Philips 3-30pF trimmer and this proved to be ideal but it may require a fixed capacitor across it to get the desired tuning range.

The oscillator can of course be 10.7MHz below or above the signal frequency. Either way presents some problems with second-channel interference. If it is below second-channel interference from f.m. broadcast stations may be heard on various frequencies whilst if the oscillator is above the signal frequency mobile radio and public service transmissions may be received. I have found that interference from any of these can be minimised by some simple circuitry and this is discussed further in the section on alignment. I favour the oscillator being on the lower side of the signal and I have made my receiver accordingly.

A slight amount of external injection from the oscillator to the mixer may be required depending on the layout used. This can take the form of two pieces of stiff wire connected to each grid pin or if more convenient of the fixed plate connections for the mixer and oscillator on the tuning capacitor and then brought into close proximity to make a small capacitive feed.

The r.f. coil for the mixer

grid (L2) needs to be about two turns of 18 s.w.g. tinned copper with slightly spaced turns and the oscillator coil (L3) four turns of 16 s.w.g. well spaced (for the oscillator on the low side of the signal), both wound on 9.5mm diameter rod. I found it better to make both coils self-supporting rather than use coil formers with dust cores. Any adjustment to the inductance needed can readily be made by squeezing or opening up the coils. In my receiver I mounted the oscillator coil on two solid pillars about 13mm high on the under side of the chassis. The mixer grid coil is best mounted above the chassis and wired directly to the moving and fixed vane connections on the tuning capacitor. Tuning drift can be a problem in valved receivers. In my receiver the frequency drift was downwards and I was able to effect some improvement by putting a 6.8pF N750 ceramic capacitor in parallel with C18 in the oscillator grid circuit. Each receiver built will have different degrees of drift and a cure of partial cure can be attempted by trying ceramic capacitors of different temperature coefficient and value in this position. The positioning of the capacitor nearer or further away from any warm spots can help.

For the r.f. amplifier I used a single pentode ahead of the mixer. The EF80 is ideal but do doubt the EF91 would also be

suitable. Although the EF80 is not a variable  $\mu$  valve, a.g.c. is applied and helps to prevent overloading the mixer on very strong signals. The grid coil (L1) needs two or three turns of 18 s.w.g. copper wire wound on 9.5mm rod. Various positions of the antenna tapping can be tried and in my receiver I have this about three quarters of a turn up from the earthy end. A separate antenna coupling winding of one turn can be tried, but I found that the tapped coil gave a better transfer of signal. As in the case of the mixer grid coil, I mounted this directly on the tuning capacitor.

### Second Mixer

The ECH81 triode-heptode makes an excellent second mixer. The triode oscillator is crystal controlled with a 10.245MHz crystal in Pierce circuit. The heptode grid is tuned to 10.7MHz and the anode to 455kHz by conventional i.f. transformers. This seems very satisfactory in operation and no other circuits were tried. Suitable crystals are available at reasonable prices from some crystal suppliers and from firms dealing in spares for the Pye radiotelephones.

### IF Amplifiers

One stage of i.f. amplification is used at 10.7MHz ahead of the second mixer and a further

stage at 455kHz after with normal i.f. transformers. Many 465kHz i.f. transformers will tune to 455kHz but I did find some that would not and a small amount of extra capacity was needed across each winding.

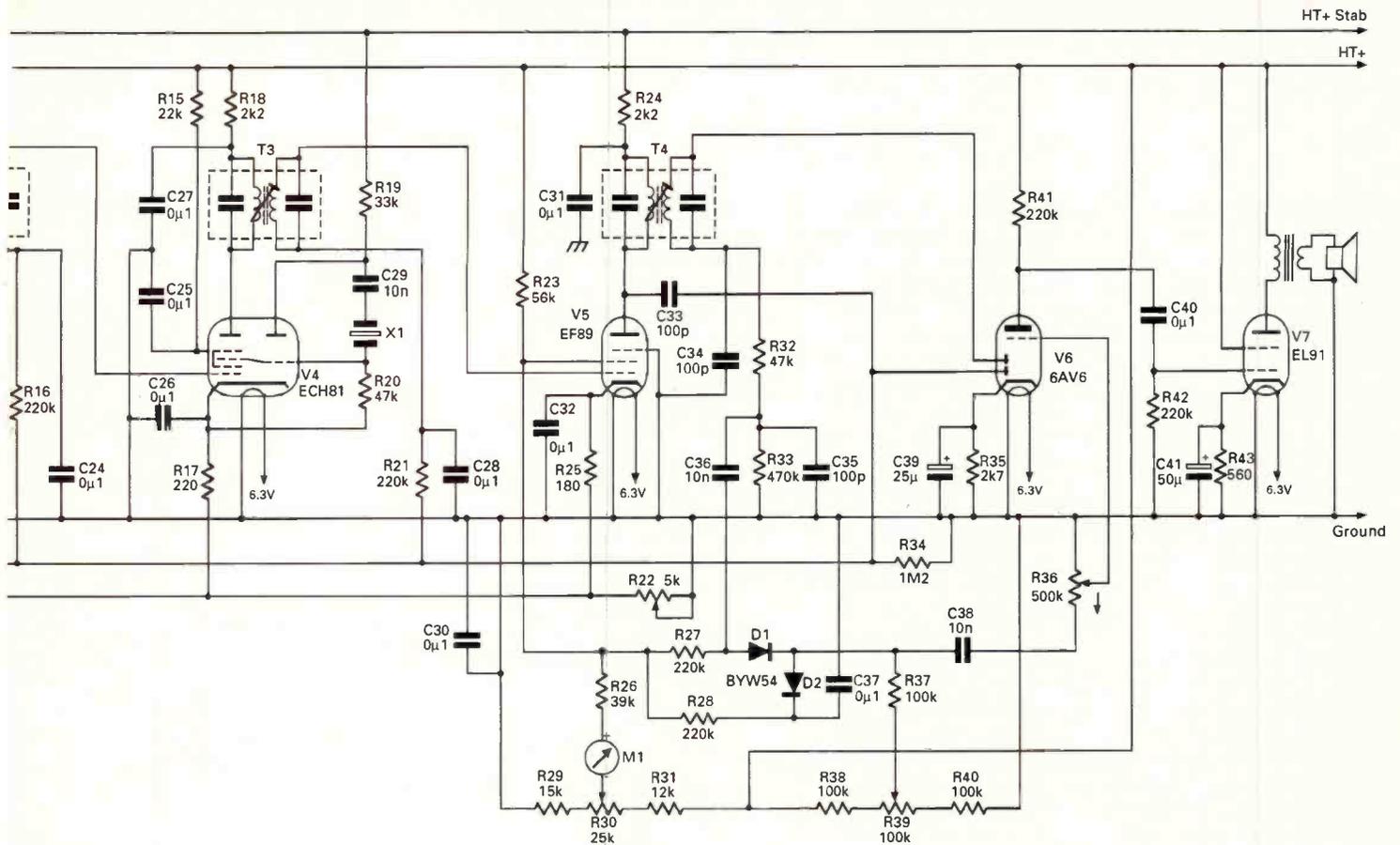
I used the EF89 valve in both stages and this provided more than enough gain. I fitted an i.f. gain control by returning the earthy end of the i.f. and second mixer valves to a 5k $\Omega$  variable resistor and this enabled the gain to be controlled nicely.

I did not try to use any lower gain valves in the i.f. stages but this is something that could be considered. The EF92 would probably be suitable.

### Detector and Audio Stages

All airband signals are a.m. and only therefore need a simple diode detector. A double triode valve was used, one diode being the detector, the other diode the a.g.c. rectifier and the triode and a.f. amplifier. The circuit is completely conventional and does not call for any particular comment.

A normal pentode was used in the output and can be almost anything that is available. I used one of the small valves - the EL91. A large audio output is not required and a valve of this class helps to keep the heat and h.t. current down.



### 'S' Meter and Squelch Circuits

I found it useful to have a signal strength meter both for using the receiver and alignment. The meter is in a bridge circuit and gives a good indication even on weak signals. A 0-1mA, or more sensitive, meter can be used with appropriate alteration of the series resistor R26.

A squelch circuit is a very worth while edition. When the receiver is left running on one channel all background noise can be eliminated in the absence of a signal by adjusting the squelch control R39. When a signal is present the squelch circuit is opened and the audio circuit operates normally. Many types of diode D1 and D2 would be suitable. They should be selected to have a good back-to-front ratio with a low forward resistance.

### Digital Read-out

A receiver of this kind must have digital read-out if it is to be used seriously. Unfortunately we have to go into the realms of semiconductors and away from our beloved valves for this feature.

It is quite easy to make a suitable unit to provide direct

read-out of the received frequency. The FC177 frequency display module is available from Cirkit and gives a read-out up to 3.999kHz and can be programmed for various offsets to accommodate different i.f. frequencies. In order to use it on airband frequencies, it needs to have the variable oscillator frequency divided by 100. This is easily arranged by means of a SP8629 i.c. with a single transistor amplifier. The transistor can be almost any *npn* type capable of working at the variable oscillator frequency.

As supplied the FC177 module will give a read-out for 10.7MHz i.f. when the oscillator is below the signal frequency. If the oscillator is above the signal frequency it is necessary to make a further connection as detailed in the data sheet supplied with the unit.

### Power Supply

The power unit needs to supply h.t. at around 200V and 6.3V for the valve heaters in the usual way from a conventional mains transformer. An h.t.+ line of 180 to 200V is quite adequate and helps to keep the heat down. If the mains transformer and rectifier used, produce

substantially more than 200V it is worth putting a resistor in the h.t. line.

In addition stabilised supplies for the two oscillators and a 5V stabilised supply for the digital read-out unit are required. The supply for the oscillators is best provided a voltage stabiliser such as the VR105 or one of the smaller equivalents. In the interests of oscillator stability the h.t. voltage should be as low as possible and I used 70 volts in my receiver, but this may need to be increased in some cases. The 6.3V heater supply line is rectified in my receiver by a single diode feeding a 7805 voltage regulator to provide the 5V supply for the digital read-out unit.

### Construction

My first version of the receiver was made on a rather large chassis with the r.f. section, i.f. amplifier and audio section built as separate units so that the various circuits could be tried and satisfactory units developed. A second receiver was then built incorporating the proven circuits.

I favour the use of double-sided printed circuit board as a chassis for valve constructional work at v.h.f. and I used this method in the

r.f. and i.f. stages. Earth connections are readily made and the board provides very good screening.

All r.f. leads must be kept as short as possible and run so that the input and output leads for each stage are well separated and screened from one another as far as possible. As mentioned before, the r.f. mixer and mixer grid coils are best mounted directly on to the tuning capacitor. If this capacitor is the type which has connecting tags on both sides the coils can be mounted on opposite sides and thus ensuring good screening. A small screen cut from thin printed circuit board fitted across the r.f. amplifier valve holder to screen the grid from the anode connections is worth doing in the interests of stability.

I need hardly stress that the variable oscillator stage must be solidly built. In my receiver I built the r.f. mixer stages into a small metal box and incorporated this into the main chassis. The inside of the bottom of the box being lined with a piece of circuit board so the recommended method of construction could be followed.

A good slow motion drive is essential for the tuning capacitor. I used a gear box

type salvaged from a RAF R1132 receiver and fitted a large heavy knob to give a flywheel effect. Very useful when changing channel quickly. With digital read-out no conventional tuning dial is of course required.

If the r.f. and mixer stages are built as a separate unit as suggested, the first 10.7MHz i.f. transformer must be mounted on this unit or on the i.f. amplifier strip. In either case the lead from the mixer anode of first i.f. grid will be longer than normal and this can lead to instability. To overcome this I fitted a flying lead for the long connection inside the i.f. transformer and brought it out through the base. The miniature coaxial cable RF174A/U is ideal for this purpose. The use of the cable increases the capacity across the winding and the fixed capacitor may have to be reduced slightly to obtain resonance. The cable mentioned has a capacity of about 33pF per metre.

I find that the Philips Beehive trimmers are ideal for r.f. circuits. They can be fitted very securely fitted by soldering the stem to the printed circuit board.

The FC177 Digital read-out unit has connections which match the holes in 0.1 in Veroboard. I used the PC8 plug available from Cirkuit (bending the pins carefully at right angles) to mount the FC177 unit to a small piece of Veroboard about 50 x 32mm on which the divider and transistor amplifier were built. This makes a very compact unit which can be fitted directly on the front panel.

**Alignment**

After completing the receiver and making sure that everything is apparently in order with voltages correct, alignment of the tuned circuits can be started.

The 455kHz i.f. stages must be aligned first as near to this frequency as possible otherwise the digital read-out will not be correct. As mentioned previously, most 465kHz i.f. transformers will

tune to 455kHz but I did come across some that would not. It is essential to ensure that the windings are actually resonating by noting that resonance occurs at two settings of each dust core (always set the core at the outer position). If only one peak is found the winding is almost certainly not resonating as all this is happening is that maximum inductance is being reached before resonance. If this condition exists a small amount of extra capacitance across the winding is needed.

When the 455kHz stage is aligned, proceed to the 10.7MHz i.f. stages and complete the alignment at this frequency. The receiver should now sound alive.

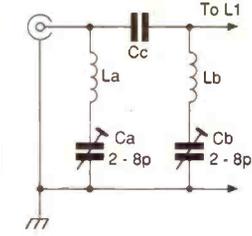
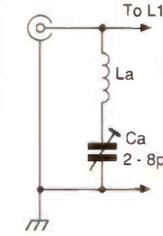
Next set the tuning range of the variable oscillator to give a upper frequency of just over 136MHz and a lower one of just below 118MHz as indicated by the digital read-out. The upper frequency should first be set by adjusting the trimmer across the oscillator tuning capacitor C17 and then the lower frequency with the trimmer from the bottom end of the oscillator coil to earth C18. It will be necessary to check both these settings a number of times as both trimmers have some effect at each end but several checks each way should enable the correct

coverage to be obtained. If this is not possible the oscillator coil L3 will have to be adjusted by compressing or opening up the turns as appropriate. This is an operation which should not be rushed and many checks at both ends of the tuning range will be needed to obtain the required coverage.

All that remains now is for the mixer grid and r.f. stages to be aligned. First try the trimmers to peak up the h.f. end and adjust the coils by bending if needed.

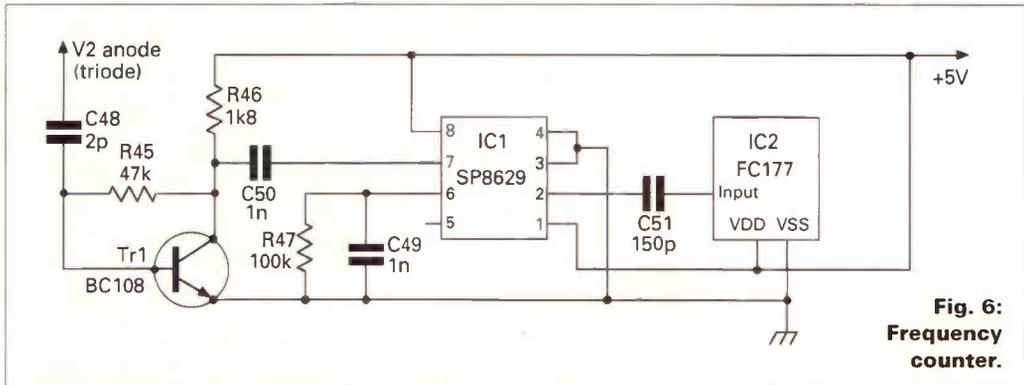
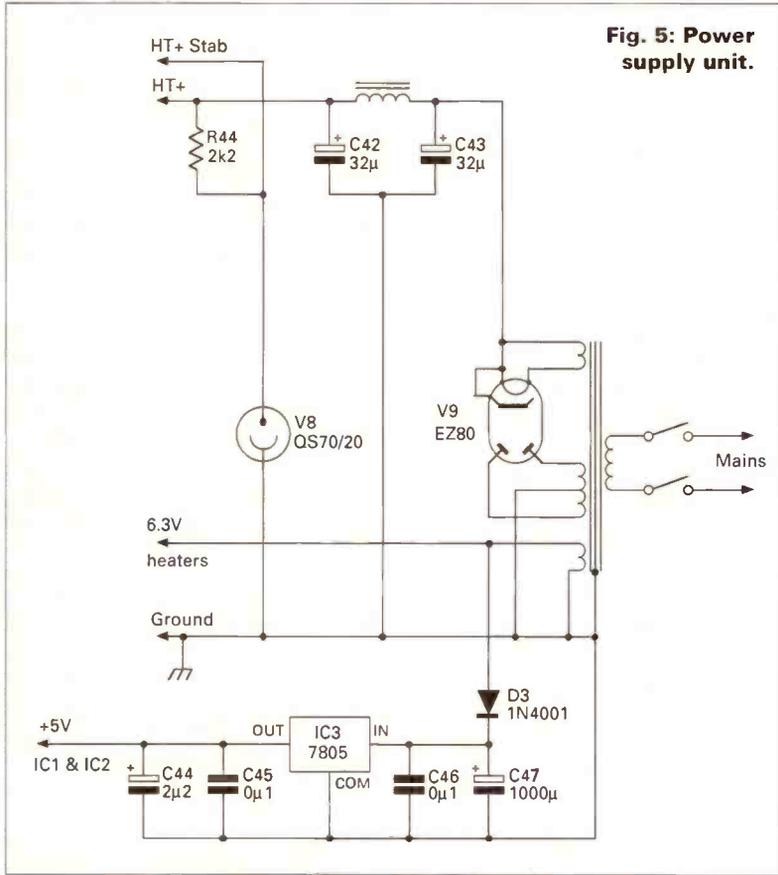
If any particularly bad second channel breakthrough occurs I have found that it can

**Fig. 3: Single-stage antenna filter.**

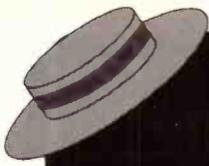


**Fig. 4: Two-stage antenna filter.**

**Fig. 5: Power supply unit.**



**Fig. 6: Frequency counter.**



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**From Finland**

'A lot of jewellerys in a small box' as we say in my country."

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**From Sweden**

suggested extra loudspeaker."

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**From Denmark**

"As a happy owner of a Lowe 225 I would like to tell you how satisfied I am with the receiver. Since 1928 I have been interested in SW listening and over the time gone, owned quite a lot of different receivers, i.e. Eddystone, Hammarlund, Collins, Yaesu, many of them very complicated to operate and needed a very good aerial. And here comes the Lowe 225 - a small, very sensitive and easy to operate on all bands. It really operates without problem in crowded bands. with strong signals. And it combines complete control of a necessarily complex piece of equipment with easy operation for the user. The Lowe 225 is a 'Must' and a great 'Hit' for every keen SW listener."

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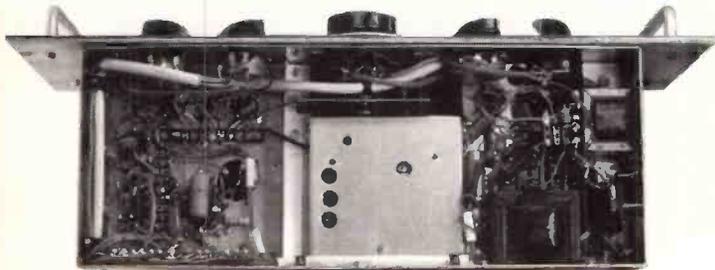
**Front View: Controls left to right – RF gain, AF gain, Squelch, S Meter zero. The large vents on either side of the frequency read-out assist with the air circulation and help to keep the receiver cool. At the left the DIN socket is for a tape recorder connection.**

be entirely or very substantially eliminated by putting a series tuned circuit from the antenna connection to earth in the r.f. stage. If breakthrough occurs at only one frequency a single stage circuit as shown in Fig. 3 can be used. When breakthrough is present on two or more frequencies a two stage circuit is shown in Fig. 4 will be needed. These circuits need to be tuned very carefully as they have a very sharp peak. In the case of the two stage circuit adjust one trimmer to the lowest breakthrough frequency and the other to the highest. This should then cover all frequencies in between. The v.h.f. f.m. transmitters at

Rowridge put in a very strong signal here and this two stage circuit virtually eliminates all the spurious signals from them. The effect on the desired frequency range of 118 to 136MHz is negligible.

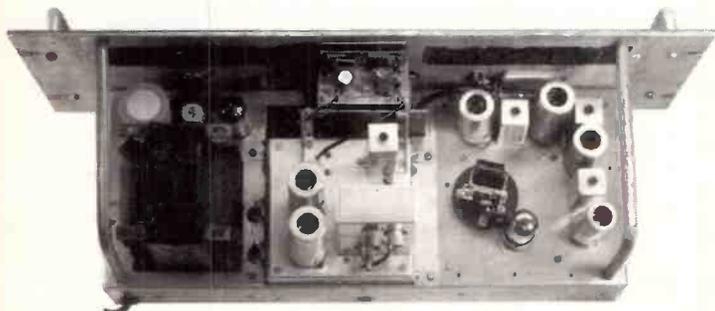
### Conclusion

The development and construction of several versions of my receiver have proved to be a very interesting and absorbing project. Excellent results can be obtained and I can thoroughly recommend the construction of an Airband receiver to any valve enthusiast looking for a new interest.



**Top Internal View: Shows RF-Mixer-Oscillator unit built in a separate box with the twin antenna filter mounted near back edge. The divide by 100 module can be seen attached to the back of the frequency display unit. The relay at the right was added after the article was written and is for the control of the tape recorder.**

**Underside View: Again this shows the RF-Mixer-Oscillator unit in a separate box with holes for access to the trimmers.**



## YOU WILL NEED

### Resistors

Carbon Film 0.25W 5%

|       |   |                             |
|-------|---|-----------------------------|
| 180Ω  | 2 | R14, 25                     |
| 220Ω  | 1 | R17                         |
| 270Ω  | 1 | R2                          |
| 680Ω  | 1 | R8                          |
| 1kΩ   | 2 | R4, 7                       |
| 2.2kΩ | 4 | R13, 18, 24, 44             |
| 2.7kΩ | 1 | R35                         |
| 6.8kΩ | 1 | R3                          |
| 10kΩ  | 1 | R9                          |
| 22kΩ  | 1 | R15                         |
| 33kΩ  | 1 | R19                         |
| 39kΩ  | 1 | R26                         |
| 47kΩ  | 3 | R20, 32, 45                 |
| 56kΩ  | 3 | R6, 12, 23                  |
| 100kΩ | 4 | R5, 37, 38, 40              |
| 150kΩ | 1 | R1                          |
| 220kΩ | 7 | R11, 16, 21, 27, 28, 41, 42 |
| 470kΩ | 1 | R33                         |
| 1.2MΩ | 1 | R34                         |

0.5W

|      |   |     |
|------|---|-----|
| 560Ω | 1 | R43 |
| 15kΩ | 1 | R10 |

1W

|      |   |     |
|------|---|-----|
| 12kΩ | 1 | R31 |
| 15kΩ | 1 | R29 |

### Potentiometers

|                   |   |                            |
|-------------------|---|----------------------------|
| 5kΩ (lin) preset  | 1 | R22                        |
| 25kΩ (lin) preset | 1 | R30                        |
| 100kΩ (lin)       | 1 | R39                        |
| 500kΩ (log)       | 1 | R36 (with d.p.d.t. switch) |

### Capacitors

Plate Ceramic

|       |   |             |
|-------|---|-------------|
| 2pF   | 1 | C48         |
| 33pF  | 1 | C8          |
| 47pF  | 3 | C3, 11, 19  |
| 100pF | 3 | C33, 34, 35 |

Polyester

|       |    |   |
|-------|----|---|
| 150pF | 1  | C51   |
| 1nF   | 4  | C4, 13, 49, 50  |
| 5nF   | 2  | C12, 14   |
| 10nF  | 6  | C21, 22, 23, 29, 36, 38                                   |
| 50nF  | 2  | C7, 15  |
| 0.1μF | 15 | C5, 6, 20, 24, 25, 26, 27, 28, 30, 31, 32, 37, 40, 45, 46 |

Electrolytic

|                |   |         |
|----------------|---|---------|
| 1μF (25V)      | 1 | C47     |
| 2μ2F (10V)     | 1 | C44     |
| 25μF (25V)     | 1 | C39     |
| 32+32μF (450V) | 1 | C42, 43 |
| 50μF (25V)     | 1 | C41     |

Variable

|               |   |            |
|---------------|---|------------|
| 4-20pF 3-gang | 1 | C1, 9, 16  |
| 2-8pF         | 3 | C2, 10, 17 |
| 3-30pF        | 1 | C18        |

### Semiconductors

Diodes

|        |   |       |
|--------|---|-------|
| BYW54  | 2 | D1, 2 |
| 1N4001 | 1 | D3    |

Transistors

|       |   |               |
|-------|---|---------------|
| BC108 | 1 | Q1 (see text) |
|-------|---|---------------|

Integrated Circuits

|        |   |     |
|--------|---|-----|
| 7805   | 1 | IC3 |
| FC177  | 1 | IC2 |
| SP8629 | 1 | IC1 |

Valves

|         |   |       |
|---------|---|-------|
| 6AV6    | 1 | V6    |
| ECF82   | 1 | V2    |
| ECH81   | 1 | V4    |
| EF80    | 1 | V1    |
| EF89    | 2 | V3, 5 |
| EL91    | 1 | V7    |
| EZ80    | 1 | V9    |
| QS70/20 | 1 | V8    |

### Wound Components

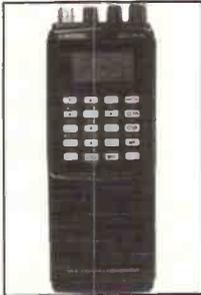
|   |                          |            |
|---|--------------------------|------------|
| Coils   | L1, 2, 3                 | (See text) |
| T1, T2  | 10.7MHz i.f. transformer |            |
| T3, T4  | 455kHz i.f. transformer  |            |
| Loudspeaker Transformer, Mains Transformer, Choke |                          |            |

### Miscellaneous

|             |           |
|-------------|-----------|
| Meter       | 0-1mA     |
| Crystal     | 10.245MHz |
| Loudspeaker |           |

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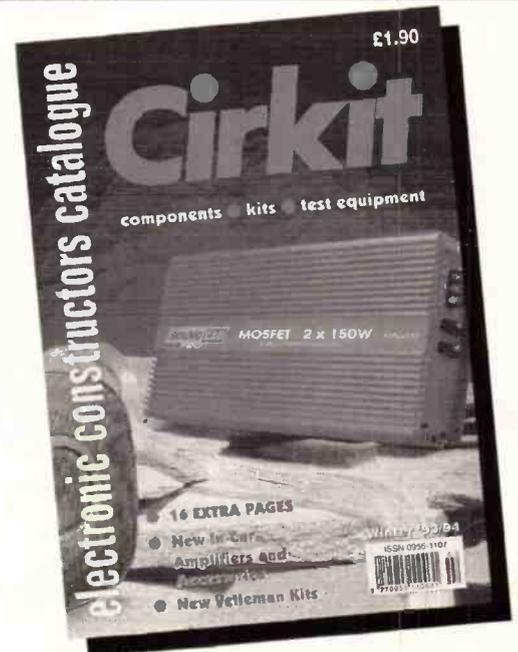
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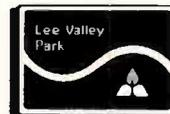
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# Satellite TV

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

Christmas traditionally across the Clarke Belt brings seasons greetings from many news feed originators, BBC, Reuters, the EBU and others. France often goes one better with a series of Santa + reindeer team, the sleigh moving across the screen in jumps to coincide with second count downs to news item inserts.

I missed the French Telecom offering this year but the NOS Holland produced a scrolling set of four pages with basic festive artwork and a staff roll call of greetings! A few examples are shown.

Christmas being a religious festival, of course, provided many appropriate hookups, Bethlehem, the Vatican and for me I enjoyed the informality of the 47th Infantry Battalion now serving in a UN role near Beirut, Lebanon at their live Christmas Day service 1130UTC. With help from the RTE, the Future TV OB unit of Beirut and Armstrong Satellite Facilities (Ireland) we saw shots of the camp, local countryside, the complete service and the soldiers relaxing after the broadcast. Particular emphasis was placed on showing the 'boys' for the benefit of the families back home. The Eutelsat II F1 (13°E) link was for me one of the pleasures of the 25th.

The holiday period is for many an excuse for excess alcoholic consumption and transponder observations at midnight December 31 suggested that most of Europe was involved in an outside broadcast somewhere simply getting drunk! Whilst Europe was celebrating 'out with the old and in with the new', Yugoslavia certainly was not celebrating. A live outside broadcast feed via the Intelsat 603 34 Sarajevo uplink was carried that night for the French M6 network. The peaceful classical music offering contrasted dramatically with the informal revelry across Europe, an odd offering perhaps with the death and destruction experienced outside of those very studio walls - the band fiddled whilst the rest of Yugoslavia burned! Interesting too the irregular mains supply producing video field ripple, another indication of the condition of Sarajevo - news reports suggested that most of the local population would not have seen the broadcast due to local mains supply outage.

The January 10 live outside broadcasts from the Chichester, West Sussex area were detailing all the flooding suffered in that area for some weeks. Sky News appeared in force with their SNG 'UKI-34 SKY-ENG CHICHESTER' truck and uplinked onto Eutelsat I F1 25°E bird with news on the hour every hour. Shots of water everywhere, reporter with vox pops and local VTR inserts -

until lunchtime when the pre-booked SIS Wolverhampton race-course feed (for the bookies service) wanted to come up with their afternoons sport. Telephonic negotiations followed and over the lunchtime so an alternation between Sky News floods and OB6 with Wolverhampton nags took place.

Some days earlier (4th) the ITN SNG-1 UK-17' took to the road into Suffolk following the revelations of the 'back to basics' controversy and the Tim Yeo activities. A late night press 'confrontation' betwixt Tim and the media as they pressed him on the steps of local Conservative HQ for a statement. The ITN truck left a camera wide shot on the uplink showing the press crush as they pressed home for any uttered word - little if anything worthwhile was forthcoming. This particular feed on Eutelsat II F3 (16°E 12.512GHz hor).

Readers Fred Hartley (Middx) and John Locker (Wirral) report a new signal from Intelsat 506 at 50°W, checkout 10.969GHz - an inclined orbiting bird producing variable signal levels over an hour or two and carrying mostly NBC programming/news.

Several enthusiasts have bought new Discus 'Elipse' receivers, a hi-tech many feature receiver of a few years ago now being sold on the surplus market for around £100 each. Keith Marriott in Notts has equipped with an Elipse, 1.6m dish and Echosphere triple band 1dB noise LNB, results are truly excellent.

In the warmer climes of Thailand, Alan Smith complains that the C Band Star TV service is downlinking programmes such as MTV, BBC WSTV and using audio on left and right channels, true stereo is not transmitted. He feels that Star are saving stereo for their 'improved top quality' Pay-per-View service via AsiaSat-2 launching later this year?

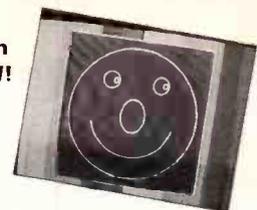
South of the Border into South Africa and Brian Williams (Gardenview) the SABC have now taken feeds of CNNI, BBC WSTV and Sky News away from BOP TV and radiate the programmes terrestrially during SABC downtime. NICAM stereo is about to start and the planned MMDS (Microwave distribution) has been dropped!

A couple of readers asked what 'IFB' was, they had seen reporters rehearsing news feed inserts fumbling with earpieces and muttering 'the IFB's not working', etc. John L advises that IFB is 'interruptible foldback' and is the TV station/studio output audio being sent as a cueing feed into the earpiece. We used to call this a reverse clean feed and usually carries the station output LESS the contributing distant reporter (to avoid howl-rounds if the IFB is

Right: A 'Happy Christmas' test card seen by John Locker (Wirral) on Hispasat 30°W!



Left: A dramatic study of the EBU West bound feed out of Moscow via Eutelsat II F4 7°E from John Locker.



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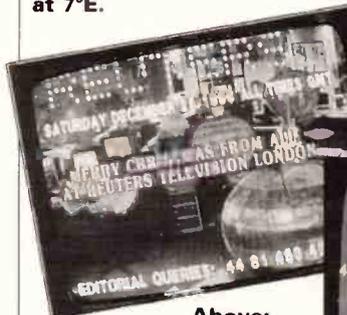
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Right: Close down of the  
Portuguese TV service  
on Eutelsat II F2 at 10°E.

Right: 'Merry Christmas'  
from the BBC

International Control  
Room - a stabilised sound in  
sync signal on Eutelsat II F4  
at 7°E.



Above:  
'Happy Christmas from  
Reuters' complete with  
swinging ball Eutelsat  
II F1 at 13°E.

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Right: January sales time from British Telecom as seen on many BT leased downlinks.

connected into a loudspeaker for use with a guest interview).

Finally Sri Lankan DXer Bandula Gunasekera advises the Gorizont bird at 103°E is now transmitting a new programme *Iain Sat Television*, a new Indian private station at 3.875GHz 0700-1730 local going 24 hours this spring. The Ekran Malayalam u.h.f. TV channel is now transmitting up to 3 hours daily at 754MHz. The Russian Orbita 1 programme continues at u.h.f. - 714MHz. so advises Bindu Padaki from Bangalore who views the Ekran signals using a 14-element cross Yagi antenna system.

## Satellite News

Intelsat moves in the sky. Soon to launch 702 will move in at 1°W, displacing the incumbent 512 that in turn moves West to 21°W. And 502 now at 21°W will be shunted further down the road to a parking slot at 40°W. Clarke Belt slot changes in the coming years will show a

general re-orientation of operational positions. The existing 63°E will move slightly to 62°E, and other new positions will be 64, 157, 330, 338 and 340°E.

Late January saw the launch of Eutelsat's latest series II bird, the F5 will slot at 36°E in March '94 and provide coverage from Europe to beyond the Caspian and parts of the Arabian Gulf.

Meanwhile on the 'Rock', Gibraltarians are awaiting details of dish planning legislation, restrictions similar to the UK are likely to be imposed shortly.

British Rail signal boxes may soon be sprouting satellite dishes! Several boxes in South Wales have already been used experimentally as a means of linking surveillance cameras back to a central security HQ in Nottingham. Information and data of train times, delays, etc., is back-linked to the local station for display on VDUs. At this time a tender has been released to equip 70 BR stations.

# Amateur Bands Round-up

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

**S**itting down to write a piece on the first working day of the New Year always means staring at a shortfall in the letters! On the other hand, it's also time to acknowledge and thank you for all the cards.

How nice to hear again from **Gerald Bramwell** in Swinton. Gerald would dearly love to get involved with Packet, but alas, the method involves in essence a radio station sending a signal saying "I'm switched on and ready to receive, my call is xxxx is there anything for me?". This is followed by the other station saying "Yes I have some for you personally and some general". The machines then go to work to exchange the data. The reason is simply to ensure that at all times a packet station is on the air it is actually in communication and endeavouring to exchange packets. Without that limitation, the bands today would be pure bedlam. Perhaps the answer is to pass either the Novice or the 'big' RAE?

Turning to Gerald's lists we find him all-c.w. on Top Band, while on 3.5MHz he copied 'phone signals from East Coast W and VEs, EA8/DL3DZZ, 9M8DB, 9K2MU, WB5KBZ/VP9, JAs, 4X1EL, ZC4KS, 5B4YX, 5T5JC, UN7EG, TI5RLI, plus phone, c.w. and RTTY. 7MHz wasn't quite so popular, but again all modes were taken from Europe, plus all continents save Oceania. The list on 14MHz shows all modes from Europe, plus phone from all continents and RTTY from Ws, VEs, UH8AAB, 9K2IC and VQ9WL. Interestingly enough, the favoured time for both 14 and 21MHz is around lunchtime and afternoons, indicating the VK and ZLs for example were short-path. Perhaps the plum on 21MHz was TL8TM/6W4 on RTTY plus all parts of the American continents with 18MHz contributing east coast W/VEs, YB0ALF and N6AR. 24MHz offered the very occasional W on sideband, one on c.w., and as for 28MHz - zilch!

**Harry Richards** (Barton-on-Humber) reads the back numbers....back in April '92 I said "in general forget Europeans". Harry takes me to task for this, but one of the difficulties I am under is that the Editor (bless his little cotton socks; I've got to keep on the right side of him!!) gives me a known amount of space, and he likes to have a picture or something to break the page up as well. Obviously European calls justify a mention if there is something of interest involved.

In Harry's collection this time comes the question of 9A2RA in Croatia and then 9A4CD, which as amateur prefixes aren't in Harry's

Call Book. 9A does appear in the 1994 UK Callbook countries listings, BUT notice that the 9A series in the ITU column, is stated to be for San Marino! Normally if you hear a call that isn't in the Callbook as such, it can be identified with fair certainty from the ITU column. Just what will be the situation when the dust finally settles in the parts of what was YU-land is anyone's guess. As for W20NV, he has always been one of the bigger signals from Stateside. The various Ukrainian stations may well have changed prefixes too between Harry's letter and you getting to read this piece.

At this point in writing the column, I received a bit of news that will change the amateur bands for ever. **Lloyd Colvin W6KG**, passed away on 14 December 1993, after a massive stroke at the American Hospital in Istanbul; Lloyd was 78. Lloyd and Iris Colvin W6QL as chief operators of the Yasm Foundation, put their signal out from over 100 countries around the world, most of them 'rare ones'. My first column appeared in 1966, and Lloyd and Iris had been stirring up the bands from faraway places for years even then. My sorrow and sympathy to Iris and her family.

Every so often, a catalogue lands in the Box Number from Axdon Books, 32 Atholl Street, Perth PH1 5NP. The telephone number is (0738) 30707 at the moment, but will change to 630707 in April. The use of my Box number identifies the sender as a regular reader, and the catalogue contains - apart from the sort of thing that the SWM Book Service carry anyway - quite a range of publications of peripheral interest; I can recommend you getting hold of a catalogue.

## New CIS Prefixes

New prefix blocks from January 1 seem to be European Russia (old UA1-3-4-6) now RAA-RIZ, UAA-UIZ; Ukraine (old UB, UT, UY) now EMA-EQZ, URZ-UZZ; Byelorussia (old UC) now EUA-EWZ; Azerbaijan (old UD) now 4JA-4JZ, 4KA-4KZ; Armenia (old UG) now EKA-EKZ; Turkmenistan (old UH) to be EZA-EZZ; Uzbekistan (old UI) now UJA-UMZ; Tadjikistan (ex-UJ) to EYA-EYZ), Kazakhstan (old UL) UNA-UQZ; Kirgiz (old UM) EXA-EXZ; and Moldavia (old UO) to be ERA-ERZ. I've not heard them all as yet, but at least this gives a guide to the possibilities.

Often in these offerings one hears of someone who has a dipole, say, firing east-west and doing a good job; but not much is being heard from north-south. Two factors here. One is the sheer lack of activity in Africa and the Poles

as compared with Europe or USA. The second is the directivity of the antenna; it just doesn't respond strongly to stuff coming from north-south.

If you have an antenna tuner, one thing you can try is to unplug the dipole from the receiver, then make up some means of 'strapping' the outer and inner of the feeder. Now, connect an earth to the appropriate terminal of the tuner, and the 'strap' to the antenna terminal; receiver of course by coaxial cable to the appropriate point on the tuner. Now tune up and log the mid-band settings for each band. If you are lucky enough to possess a decent noise bridge that can give a near-total null, set it for 50Ω, connected to the receiver side of the tuner, and the receiver to the bridge detector terminals to obtain the settings. Your dipole can be turned into your vertical in seconds; in effect you have given yourself a second antenna!

Just one point though: no practical antenna is in free space, so, of course, the local terrain, buildings and so forth affect the response. If you are next door to and on the North side of a big gasometer, about the only African signal you could hear will have gone right round the world to reach you from the north. That would need some good conditions!

## Slim!

He seems to be everywhere! The VK0MC claiming to be on Macquarie Island is very definitely dud. There won't be an amateur op there at least till the latter end of '94. VR8B is Ducie Island Slim; of course another phoney - he couldn't be on Ducie Island and anyway the prefix is wrong! VK9NS reports he had the dubious pleasure of 'working himself' when he heard a station claiming to be 'VK9NS on Norfolk Island'; Jim and Kirsti then had a 'few words of prayer' with the gent who disappeared but has doubtless borrowed someone else's call. '905CW' was another Slim; claiming to be PY2CWW. In answer to a letter, Nagib wrote to GW3CDP and pointed out that he had no gear and hadn't been on the air for 23 years; and the Brazilian Embassy in Tehran wrote to say they knew of no Nagib Thame at their Embassy.

## Expeditions

The latest news of the Pratas Island expedition is that it was to be on the air between 0300-0730Z on January 5, signing BV0ARL/BV9P. There were to be

four BV operators plus OH2BH. If they are going to do it in four-hour stints, it'll be a while before the demand diminishes. But if Martti has a foot in the door, he might just force it a bit more open.

As for the Peter 1 Island effort, it is understood that the group leave UK on January 17, and it is hoped to give you the final details before this goes down.

## Contests

Don't forget the CQ WW WPX Sideband contest over the weekend March 26-27; this one always scares up some new prefixes and rare countries. Another one that you might look at is the ARRL International DX Contest; the phone weekend is March 5-6.

**Leighton Smart** in Trelewis notes the GW Christmas Top Band QSO Party that started around 1930 and carried on to 0130. Still with Top Band, Leighton has been working on his Top Band antenna by getting it up in the air on one hand, and improving the 'underside' of the system. This has involved adding to the buried radials a quarter-wave counterpoise, and adding all the fencing around the property. As to what it has achieved, Leighton reckons he is hearing stations far better now.

It brings out a good point; just how can an s.w.l. evaluate an antenna? Usually, on any given band, there will be some signals that can be regarded as steady markers. Personally, I tend to go for various 'locals' several miles away, and for DX the VK ZL and ZS signals serve well. Log them all, carefully noting the signal strength and all control settings.

On the DX signals stick to a given (UTC) time each day for several days. Change the antenna, retune the antenna tuner, and ditto repeat. Personally, I have two tuners; one for the reference and one for the antenna under test. Each is set to give me unity s.w.r. on its own antenna. Now, I can flip the switch from antenna to antenna instantly, thus removing the effects of changing conditions. In addition, one has to allow for 'conditions' - so I always make notes of what the DK0WCY beacon on 10MHz says about conditions that day. If you can't read Morse, then listen carefully to the GB2RS news on Sundays.

## Finito!

That's the lot for this time. Letters, as always, to Box 4 Newtown SY16 1ZZ, to arrive by the beginning of the month.

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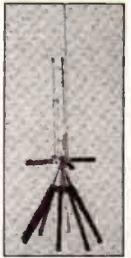
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# DXTV Round-up

Ron Ham, Faraday, Greyfriars, Storrington,  
West Sussex RH20 4HE

**A**lthough very little Sporadic-E and the predominantly wet weather made December a poor month for the reception of long distance (DX) television signals, on all bands, we still have some interesting items to discuss. Including the weather and the storage of photos on a CD-ROM.

## Band I

**Peter Barber** (Coventry) made a special study of Band I throughout 1993. He used an ex-United States Navy Hallicrafters 'S27' communications receiver with a cathode ray oscilloscope monitoring its output and two multi-band TV receivers. Equipped like this he could hear and see as many television signals as possible.

As expected, he found a lot of Sporadic-E activity between mid-April and the end of August with many hours of openings in June and July. Peter kindly sent me a chart, Fig. 1, showing the results of his estimated 3000 hours of observations. Peter's dedicated effort has shown that there was a fair amount of 'out of season' Sporadic-E in January and February, a bit less in October and

November and quiet in December. This work of yours is important Peter, because, it places facts about Band I openings on record and is a practical guide for our new readers and a useful log comparison for our 'seasoned' DXers.

With help for the newcomers in mind, **Bob Brooks** (Great Sutton) often sends photographs from his Band I archives. This time he sent one of the Commonwealth Of Independent States (CIS) Logos NTA, Fig. 2 and a news item with Boris Yeltsin, Fig. 3, which he most likely received on Chs. R1 (49.75MHz) and/or R2 (59.25MHz) while the band was open in that direction.

During one of those rare December openings, on the 21st, **Simon Hamer** (New Radnor) logged pictures from Spain's TVE-1 on Ch. E2 (48.25MHz).

## Meteors

On December 13, Simon Hamer, tuned through Band I while the Geminids meteor shower was in progress and, around 2245, he received bursts of unidentified pictures, via meteor trail reflection, on Chs. E2, E3 (55.25MHz) and R1.

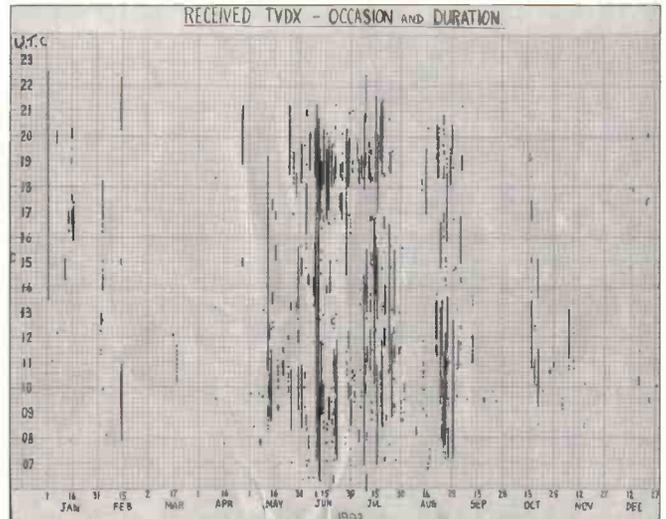


Fig. 1: 1993 Band I study by Peter Barber.

Fig. 4: NTA logo via Eutelsat II.



Fig. 2: CIS DXTV.



Fig. 3: CIS DXTV.

Fig. 5: Satellite TV from Dubai.

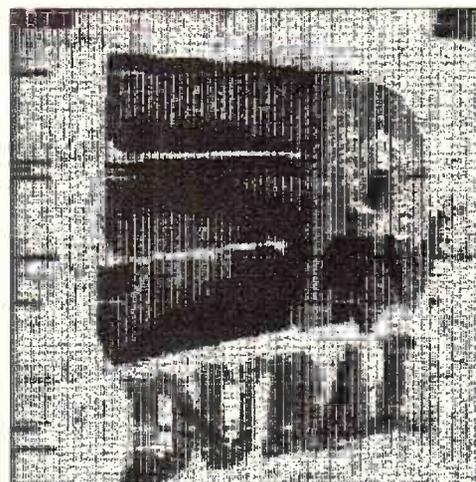


Fig. 6: Satellite TV from Finland?



## Satellite TV

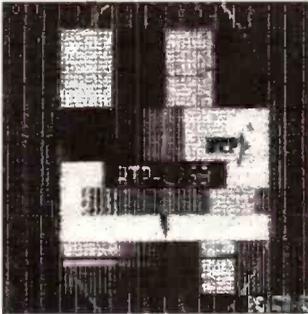
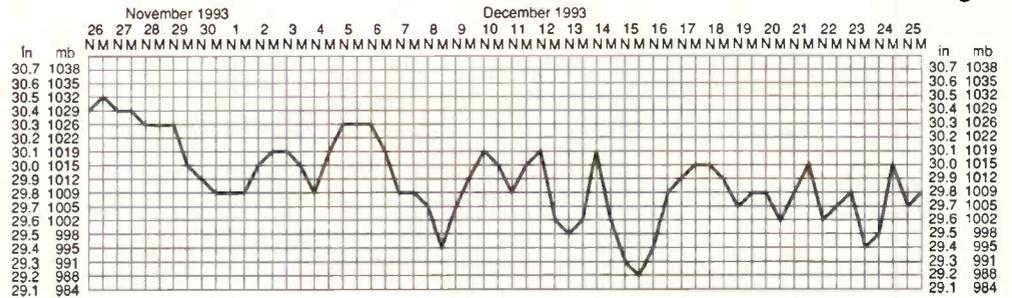
At 1700 on 25 December 1991, **Peter de Jong** received the NTA logo, Fig. 4, via Eutelsat II and says that it translates as 'TV Information Agency'.

Over the recent Christmas holiday, **John Scott** (Glasgow) received satellite TV pictures from stations in Dubai, Fig. 5, Finland?, Fig. 6 and Portugal (Lisbon), Fig. 7. However, on January 1, Simon Hamer saw the river Arun 'in full flow on one of the many German satellite channels. I'm not surprised Simon, Sussex rivers have been making the national news because the heavy rain in December, Fig. 8, caused them to flood and many roads to close. Around 1600 on December 30, I drove home from Chichester through the flood waters of the Arun and the Lavant and, as I write this on January 12, it is raining and a gale is blowing. The BBC and IBA local radio stations have kept us updated on the situation and I have just heard that the Lavant is again on 'Red Alert'. Up to 1700 today my weather log shows 4.81in of rain and when this is added to the December total, Fig. 8, it's no surprise that the south-coast waters are currently in flood.

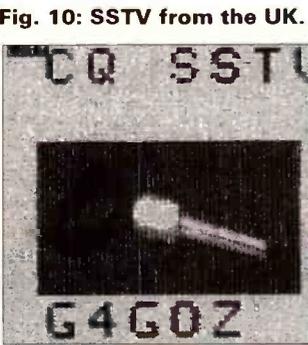
## Weather

During December I recorded 8.97in of rain, compared to 3.28in for the

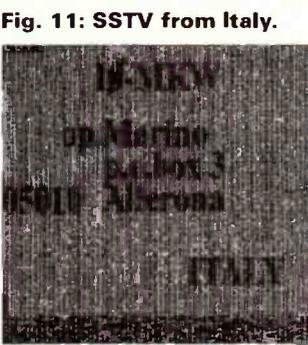
**Fig. 9**



**Fig. 7: Satellite TV from Portugal.**



**Fig. 10: SSTV from the UK.**



**Fig. 11: SSTV from Italy.**



**Fig. 12: SSTV from Spain.**



**Fig. 13: SSTV from Finland.**

same period in 1992. There were falls of over 0.60in on days 8, 12, 20 and 28 and heavy falls of 1.25in on the 19th and 1.95in on the 30th. This brings the year's total to 47.18in, Fig. 8, some 11.69in more than the total for 1992.

At 1920 on the 24th there was a large lunar halo in the atmosphere which, as we have seen before, is a sure sign of bad weather to follow. There were snow flurries on the 25th, mixtures of rain and wind on the 28th (0.65in) and 29th (0.53in) and the violent storms on the 30th. The relative humidity topped 80% on about 8 days, early morning frosts were reported on days 14, 26 and 27, rain fell on 19 days and there were strong winds on many others. I produced the bar-chart, Fig. 8, using the 'Chart' program in the Lotus Works software packed with my Packard Bell computer.

### CD-ROM

While on the subject of computers, I recently fitted a CD-ROM drive into the spare 5.25in bay on the 'Bell's' systems unit. From the range available I decided on the Panasonic 562B 'drive only' that was supplied with two leads and the necessary software on a 3.5in floppy disc. One lead coupled the drive's audio output to the sound unit and the other, a multi-way 'flat' cable, connected to the interface on the sound card.

As my particular 'Bell' did not have its own sound system I purchased an Orchid 'Sound Producer Pro' that comprised the complex sound card, two matching speakers, the 'set-up' software on a 3.5in disc, a small microphone and a well produced handbook. The microphone is for adding voice comments to files and, a program called 'Monolog' will read an ASCII file to you with good clear diction.

In addition to other sound features, the Orchid card has an onboard interface for the Panasonic and other makes of drive unit. Both the drive and the card were relatively easy to fit. The four screws for the former were packed with the 'Bell' and the latter plugged into one of the computer's expansion slots. I have included this short review because I know that many of our readers have an interest in computers.

Also, our TVDXers may

like to know more about the photographic reproduction capability of a CD-ROM drive that is 'Kodak PhotoCD Compatible'. Briefly, the Kodak software is supplied on a compact disc and includes 24 sample photographs that can be loaded into 'Windows' on command and then sized and shaped in a variety of ways. Because of the rapidly changing computer market and technology, you must make your own enquiries about a drive and sound system to suit your machine and pocket. Do shop around, because there is a wide range of good products to choose from.

A photographic dealer told me that a blank ROM disk holds up to 100 photos and costs about £5. This is then sent with your film to the 'developers' who return it with your pictures on it ready to run on your computer, along with the usual negatives and prints. I have not tried this yet, but it seems that the disk accompanies each film that you want processed in this way until it is full. A Kodak stockist can advise about the cost of this specialised work. More on this subject later folks when I have had time to 'play', hi! Meanwhile, do let me know of any experiences that you have had in this field so that I can pass it on to readers in a later issue.

### Tropospheric

Despite the poor December weather, which was no good for tropospheric 'DX', Tim Bucknall (Congleton) found reasonable conditions on the 8th and 10th when he logged colour pictures, on the u.h.f. band, from stations in Germany and Ireland. From the UK, he received signals from the BBC/IBA transmitters at Emley Moor, Over Bidduiph, Saddleworth, Sutton Coldfield and

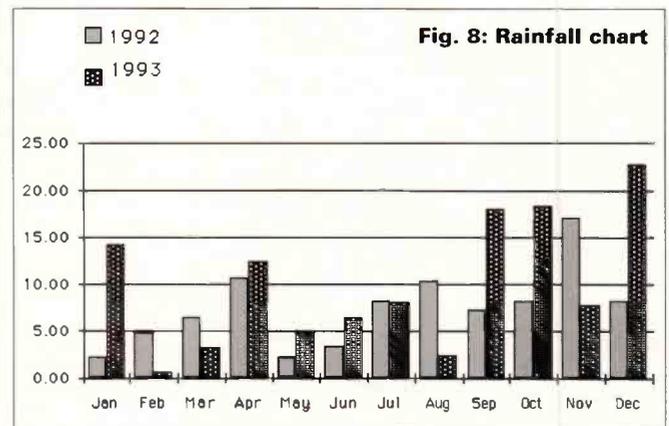
Winter Hill. Simon Hamer found Band III open on the 26th when he logged pictures from Norway (NRK) on Ch. E8 (196.25MHz).

The daily variations in atmospheric pressure for the period seen in Fig. 9 were taken at noon and midnight from the Short & Mason Barograph installed at my home in Sussex.

### SSTV

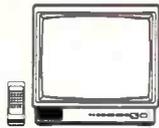
During December, John Scott noted that colour slow-scan television pictures were being transmitted by a 'G' station net on most days around 7.043MHz. He told me that the 14MHz band was also busy at times and, although pulses were audible from stations in America the signals were not strong enough for him to build up a complete picture. However, he did copy a calling caption from the UK, Fig. 10, an ident from Italy, Fig. 11, the seasons greetings from Spain, Fig. 12 and a sign-off from Finland, Fig. 13.

John kindly sent me a video tape showing those, as he received them, in colour. He also added a selection of slow scan captions that he had copied earlier in 1993 from stations in Finland, France, Germany, Luxembourg, Sweden, Switzerland and the UK. Very often the transmitted captions include well-known Disney characters and photographs of the home, equipment and the operator. John uses a terminal program for his PC called SSTV.COM that in turn controls his Robot 1200c via the RS232 port. "I have all my slow-scan pictures saved on audio tape," said John, because to store via the computer uses a lot of memory even for one picture. I found that, the 'TBK' logo that I scribed on my computer for an earlier column took about 500K.



**Fig. 8: Rainfall chart**

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

# Maritime Beacons

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

**D**uring October, November and December the propagation conditions at night often proved to be favourable for i.w. maritime radiobeacon DXing. Quite extensive logs were compiled by some listeners and there are many interesting entries in the chart.

The sky wave signals from some quite distant beacons reached the UK after dark. The Canary Island beacons at La Isleta (LT) on 291.1 and Punta Lantaila (NA) on 291.9 were heard for the first time by several DXers. Two on the coast of N Africa were also heard: Caxine, Algeria (CX) on 287.0 and Table d'Oukacha, Morocco (AK) on 305.7kHz. Also logged were Mahon, Balearic Is (MH) on 292.0; Punta Spadillo, Sicily (PT) 302.5 and Punta della Penna, Italy (TL) 314.5.

Some sky wave signals arrived from a northerly direction. The ident (AB) of the Faeroes beacon at Akraberg was heard on 381. Several listeners picked up the signals from beacons around the coastline of Iceland. Even more distant, the Prins Christians Sund beacon (OZN) in Greenland on 372 was logged by **Steve Cann** in Southampton! Up in Iceland **Geoff Crowley** (Hafnarfjörður) heard for the first time a beacon from outside that country - it was the Rhinns of Islay beacon (RN) on 293. He says, "this is a confusing callsign for me as just along the bahd at 291.9 is RN from Reykjanes!".

Quite a few of the beacons around the coast of Norway, Sweden and Denmark were mentioned in the reports. Some along the Baltic coast were also logged. Both **Chris Edwards** (Inverurie) and **Peter Polson** (St Andrews) heard the ident (WW) on 312.5. Chris is convinced it was from the Ventpils beacon in Latvia, because it was operating in sequence with others on that frequency, namely Akmenrags, Latvia (AK), Baltijsk, Latvia (BK),

Mys Taran, Latvia (BT), Klaipeda Rear, Lithuania (KA) and Leipaja, Latvia (LB). In the December chart Ventpils was shown as being on 309.0, but **John Wells** (East Grinstead) subsequently pointed out that an aeronautical marker beacon (WW) in Belgium operates on that frequency.

By using a directional loop ahead of his Lowe HF-225 receiver in Edinburgh, **Kenneth Buck** has established that the beacon signal (WW) on 309 comes from a direction roughly at right angles to that expected for beacons in the Baltic region. Owing to interference from nearby TV receivers\* he has been unable to hear (WW) on 312.5, but he was able to identify three Latvian beacons on that frequency (BT, BK & LB) and their signals did come from the expected direction.

(\*312.5kHz is exactly the 20th harmonic of the TV line timebase frequency of 15.625kHz).

Although I have no official information to confirm that WW is part of the Baltic group on 312.5, this does seem likely. Several DXers logged WW on 309, but to avoid further confusion I have not included their entries in the chart.

Some interesting logs were also compiled during daylight. Both **George Millmore** (Wootton, IoW) and **John Stevens** (Largs) found that the ground waves from some beacons were weaker than they had received during the summer and autumn.

The listeners who send along regular reports for this series have been joined this time by **John Eaton** (Woking), **Gerry Haynes** (Bushey Heath), **Albert Moore** (Douglas, IoM), **Ned Stevens** (Accrington), **Ern Warwick** (Plymouth) and **Peter Westwood** (Farnham). Perhaps their logs will encourage others to try searching the band and then send along a report for the next article that will be published in the June SWM.

| Freq. (kHz) | Call Sign | Station Name        | Location    | DXer                                     |
|-------------|-----------|---------------------|-------------|--|
| 284.5       | LZ        | Lizard Lt           | S Cornwall  | A*,B*,C,D*,E*,G,J,M,PR,X,Z,1             |
| 284.5       | MA        | Cabo Machichaco     | N Spain     | B*,E*,G*,I*,J*,S*,T*,X*,1*,3*            |
| 285.0       | NO        | Cabo de la Nao Lt   | S Spain     | E*,G*,J*,1*                              |
| 285.0       | NP        | Nieuport W Pier     | Belgium     | E*,G*,J,Q,U*,1,3                         |
| 286.0       | TR        | Tuskar Rock Lt      | Eire        | A*,C,D*,E,G,I,J,K,N,O*,P,Q,S*,T*,X,Y,1,3 |
| 286.5       | AL        | Almagrundet Lt      | Sweden      | E*,J*,S*,3*                              |
| 286.5       | BY        | Baily Lt            | Eire        | E*,J*,N,W*,X                             |
| 286.5       | FE        | Cap Frehel Lt       | France      | G*,J*,M,X*                               |
| 286.5       | FT        | Cap Ferret Lt       | W France    | D*,E*,G,I,J,S*,1,3                       |
| 286.5       | NK        | Inchkeith Lt        | F of Forth  | C,I,T*                                   |
| 287.0       | CX        | Ras Caxine          | Algeria     | D*                                       |
| 287.3       | BR        | Cap Bear            | France      | 2*                                       |
| 287.3       | BT        | Bjartangar Lt       | Iceland     | F*                                       |
| 287.3       | IB        | I Berlenga          | Portugal    | E*                                       |
| 287.3       | JA        | Jaroslawiec         | Poland      | I  |
| 287.3       | KB        | Kolobrzeg           | Poland      | I*                                       |
| 287.3       | LE        | Leba Rear           | Poland      | I  |
| 287.3       | MD        | Cabo Mondego        | N Spain     | E*,J*                                    |
| 287.3       | OD        | Swinoujscie         | Poland      | I*                                       |
| 287.3       | SE        | Sete                | France      | E*                                       |
| 287.5       | DO        | Rosedo Lt           | France      | D*,E*,G*,J*                              |
| 287.5       | FR        | Faerder Lt          | Norway      | C,D*,E*,G*,J*,Q,T*,1,3                   |
| 288.0       | HH        | Hoek van Holland    | Netherlands | E*,U*,V*                                 |
| 288.0       | KL        | Skinna Lt           | Norway      | C,E*,I,J*,K*,S*,1*,3                     |
| 288.0       | OH        | Old Head of Kinsale | Eire        | D*,G*,J*,P,Q,X                           |

| Freq. (kHz) | Call Sign | Station Name         | Location      | DXer   |
|-------------|-----------|----------------------|---------------|--|
| 288.5       | CT        | Point de Combril Lt  | France        | 1  |
| 288.5       | FI        | Cabo Finisterre Lt   | NW Spain      | A*,C,D*,E*,G*,I,J,R,S*,T*,X*,1*,3*                     |
| 288.5       | YM        | Ijmuiden Front Lt    | Netherlands   | C,E*,I,J*,Q,U*,V*,3                                    |
| 288.5       | UD        | Cabo Salou           | S Spain       | G*,N   |
| 289.0       | BL        | Butt of Lewis Lt     | Isle of Lewis | C,I  |
| 289.0       | BY        | Baily Lt             | Eire          | A*,B,C,D*,E,G,I,J*,K,O*,P,Q,S*,V,W*,1,3                |
| 289.0       | MN        | Hammerodde           | Denmark       | C*,E*,I,J*,3*  |
| 289.5       | KY        | Oksoy Lt             | Norway        | D*,E*  |
| 289.5       | LO        | Landsort S Lt        | Sweden        | C*,D*,E*,H*,I,T*,1,3*                                  |
| 289.5       | SN        | Ile de Sein NW Lt    | France        | D*,E*,G*,J,S*,1  |
| 290.0       | BS        | Port en Bessin Lt    | France        | 1  |
| 290.0       | FD        | Fidra Lt             | F of Forth    | C,E*,I,T*,X  |
| 290.5       | DY        | Duncansby Hd Lt      | NE Scotland   | C,E*,I   |
| 290.5       | LL        | Hallo Lt             | Sweden        | I  |
| 290.5       | SB        | S Bishop Lt          | Pembroke      | A*,C,D*,E,G,I,M,P,Q,R,X,Y,1,3                          |
| 290.5       | VI        | Cabo Villano Lt      | N Spain       | B*,C,D*,E*,G*,I,J*,K*,O*,R*,S*,T*,U*,V*,X*,Z,1,3*      |
| 291.0       | TG        | Torsvag Lt, Koja     | Norway        | I*   |
| 291.5       | OR        | Orskar Lt            | Sweden        | E*,J*  |
| 291.5       | SU        | South Rock LV        | Co Down       | A*,C,D*,E,G,I,J,K,N,P,Q,S*,T*,X,1,3                    |
| 291.9       | LT        | La Isleta            | Canaries      | E*,J*,J*,S*  |
| 291.9       | MR        | Montedor Lt          | Portugal      | E*,J*  |
| 291.9       | NA        | Punta Lantaila       | Canaries      | D*,E*,G*,I*,J*   |
| 291.9       | RN        | Reykjanes Lt         | Iceland       | F  |
| 292.0       | MH        | Mahon, Minorca       | Balearic Is   | E*,G*  |
| 292.0       | SJ        | Souter Lt            | Sunderland    | B*,C,E,I,K,P*,Q,S*,T*,X,Y,1,3                          |
| 292.0       | TO        | Torungen Lt          | Norway        | C,D*,I*,T*   |
| 292.5       | SM        | Point St Mathieu Lt  | France        | A*,D*,E,G,I,J*,Q,S*,Z,1,3                              |
| 293.0       | CP        | St Catherine's Lt    | IoW           | A*,D*,E*,G,I,J,K,L,M,P,Q,R*,S*,U*,Z,1,2,3              |
| 293.0       | RN        | Rhinns of Islay Lt   | Is of Islay   | C,E,F*,I*,J,N,T*,X                                     |
| 293.0       | SY        | Svinoy Lt            | Norway        | B,C,E*,I,K*,Q,T*                                       |
| 293.5       | RO        | Cabo Silleiro Lt     | N Spain       | E*   |
| 294.0       | KU        | Kullen High Lt       | Sweden        | C,D*,E*,I*,J*,T*,3*                                    |
| 294.0       | PH        | Cap d'Alprech        | France        | A*,C,D*,E*,G*,I*,J,K,P*,Q,3                            |
| 294.5       | BA        | Black Hd Lt          | N Ireland     | E  |
| 294.5       | KA        | Kaybolovo Lt         | Estonia       | I*,S*,3*   |
| 294.5       | KC        | Old Hd of Kinsale    | Eire          | E*   |
| 294.5       | MH        | Mohni Lt             | Estonia       | D*,I,3*  |
| 294.5       | NG        | Pikasaare Dts        | Estonia       | E*,J*  |
| 294.5       | PA        | Pakrineem Lt         | Estonia       | O*,E*,I,Q,3*   |
| 294.5       | PS        | Point Lynas Lt       | Anglesey      | E*,J*,V,1,3*   |
| 294.5       | PT        | Souter Lt            | Durham        | C,I,K  |
| 294.5       | SN        | Sletnes Lt           | Norway        | E*   |
| 294.5       | UK        | Sunk Light Vessel    | Off Essex     | D*,E*,G,I,Y,1,3  |
| 295.0       | CB        | La Corbiere Lt       | Jersey C.I.   | C*,E*,G*,I*,J,P,Q,R*,S*,Y*,Z,1,3                       |
| 295.5       | RE        | La Rochelle          | France        | E*   |
| 296.0       | BH        | Blavandshuk Lt       | Denmark       | B*,C,D*,E*,G*,I,J,K,Q,S*,T*,U*,1,3                     |
| 296.0       | GR        | Georee Lt            | Netherlands   | D*,J,I   |
| 296.0       | KN        | Skrova Lt            | Norway        | O*,E*,I*,T*,3*   |
| 297.0       | FG        | Point de Barfleur Lt | France        | A*,D*,E*,G,I,J,K,L,M,P*,Q,R*,S*,T*,Y,1,2,3             |
| 297.5       | MA        | Mantyluoto           | Finland       | D*,E*,I  |
| 297.5       | PS        | Cabo Penas Lt        | N Spain       | A*,D*,E*,G*,I,J*,Q,S*,T*,1                             |
| 298.0       | GX        | Ile de Groix         | France        | C*,D*,E*,G*,I*,Y*,1                                    |
| 298.5       | RR        | Round Is Lt          | Is of Scilly  | A*,C,D*,E,G,I,J,K*,L*,M,N,P,Q,R*,S*,T*,V*,X*,Y,Z,1,2,3 |
| 298.5       | SW        | Skagen               | Denmark       | C*,E*,I,J*   |
| 298.8       | OV        | Djupivogur           | Iceland       | O*,I*,J*,3*  |
| 298.8       | HO        | Hornbjarg            | Iceland       | J*   |
| 299.0       | AD        | Ameland Lt           | Netherlands   | C,D,E*,I,J,K,Q,U*,1,3                                  |
| 299.0       | BN        | Les Baleines         | W France      | D*,E*,G*,S*,3*   |
| 299.0       | HB        | Hals Barre Lt        | Denmark       | I  |
| 299.0       | O         | Tarifa               | S Spain       | E*,J*  |
| 299.0       | UN        | Understen Lt         | Sweden        | I*   |
| 299.5       | BN        | Les Baleines         | France        | J  |
| 299.5       | NP        | Nash Point Lt        | S Wales       | A*,D*,E,G,I*,K,L,M,P,Q,R*,S*,Y,1,2,3                   |
| 299.5       | SK        | Skomvaer Lt. Rost    | Norway        | E*,I,J*,Q,3*   |
| 299.5       | VR        | Utvaer Lt            | Norway        | B*,C,E*,I,J,K,Q,S*,T*,1*,3*                            |
| 300.0       | MZ        | Mizen Head           | Eire          | D*,E*,G*,P,Q,X,1                                       |
| 300.0       | TI        | Cap d'Antifer Lt     | N France      | A*,D*,E,G,I,J,L*,M,R*,S*,U*,1,3                        |
| 300.5       | DU        | Dungeness Lt         | Kent          | C,O*,E,G,I,J,L*,M,R*,S*,U*,1,3                         |
| 300.5       | LA        | Lista                | Norway        | E*,G*,K,Q  |
| 301.0       | CA        | Point de Creach      | France        | A*,D,E,G,J*,S*,1                                       |
| 301.0       | ER        | Eierland Lt          | Netherlands   | C,E*,I,J,Q,3   |
| 301.1       | RG        | Raufarhoefn          | Iceland       | E*,J*  |
| 301.5       | KD        | Kinnards Hd Lt       | NE Scotland   | C,D*,E*,I,J,K,P,Q,S*,T*,1,3                            |
| 301.5       | LB        | Torre de Hercules    | N Spain       | D*,E*,J*,S*  |
| 301.5       | OB        | Hoburg               | Sweden        | D*,E*,G*,J*,T*,1*,3*                                   |
| 302.0       | RB        | Cherbourg Ft W Lt    | France        | A*,D*,E,G,H,I,L,M,R*,Y,Z,1,2,3                         |
| 302.5       | FB        | Fiamborough Hd Lt    | Humberside    | A*,B*,C,D*,E,G,I,K,L,P,Q,S*,T*,U*,W*,X,Y,1,3           |
| 302.5       | PT        | Punta Spadillo       | Sicily        | G*   |
| 303.0       | D         | Rota                 | SW Spain      | D*,E*,G*,Z   |
| 303.0       | FV        | Falsterborev Lt      | Sweden        | C,E*,I   |
| 303.0       | YE        | Ile d'Yeu Main Lt    | France        | C,D*,E*,G*,I*,M,R,S*,V,Z,1                             |
| 303.4       | MA        | Malarrif Lt          | Iceland       | F*,J*  |
| 303.5       | BJ        | Bjornund Lt          | Norway        | C,E*,I,J*,K*,T*  |
| 303.5       | FN        | Feistein Lt          | Norway        | C,I,Q,S*   |
| 303.5       | IA        | Llanes Lt            | N Spain       | A*,D*,E*,G*,J*,S*,Z,1                                  |
| 303.5       | OR        | Punta de Llobregat   | S Spain       | G*   |
| 303.5       | VL        | Vieland Lt           | Netherlands   | D*,E*,J,Q,U*,1,3                                       |
| 304.0       | PS        | Point Lynas Lt       | Anglesey      | B*,C,D*,E,G,K,L,O*,P,Q,S*,V,W*,X,1,3                   |
| 304.0       | SB        | Sumburgh Hd Lt       | Shetland Is   | D*,I,T*  |
| 304.5       | GY        | Castle Breakwater    | Guernsey C.I. | O*   |
| 304.5       | MY        | Cabo Mayer Lt        | N Spain       | D*,E*,G*,J*,S*,Z,1*                                    |
| 305.0       | FP        | Fife Ness Lt         | SE Scotland   | C,D*,E,I,K,P,Q,T,X,1,3                                 |
| 305.0       | GA        | Malaga               | S Spain       | G*,Z   |
| 305.5       | AL        | Point d'Ailly Lt     | France        | A*,C,D*,E*,G*,H,I,K,L,M,Q,R*,S*,T*,U*,Y,Z,1,2,3        |
| 305.7       | AK        | Table d'Oukacha      | NW Morocco    | E*   |
| 305.7       | DA        | Dalatangi Lt         | Iceland       | D*,E*,G*,J*,3*   |
| 306.0       | EC        | Elizabeth Castle     | Jersey C.I.   | G*,M,1   |
| 306.0       | FN        | Walney Is Lt         | Off Lancs     | C,D,E,K,N,P,Q,S*,W*,X,1,3                              |
| 306.0       | TF        | Thyboron             | Denmark       | C,I,J*,T*  |
| 306.5       | GJ        | Le Grand Jardin Lt   | France        | J*   |
| 306.5       | KL        | Kolkasrags           | Estonia       | E*,I   |
| 306.5       | KR        | Kubassaar            | Estonia       | E*,I   |
| 306.5       | MV        | Morzhovskiy          | Arctic        | I  |
| 306.5       | OR        | O Osmussaar          | Estonia       | E*,J*  |
| 306.5       | RS        | Ristna               | Estonia       | E*,I   |
| 306.5       | SY        | Sorve                | Estonia       | E*,J*  |
| 306.5       | UT        | Utsira               | Norway        | C,D*,E*,G*,I,K,Q,S*,T*,1,3                             |
| 307.0       | GL        | Eagle Island Lt      | Ireland       | C,D*,E,G,I*,J,P,T*,V,X,3                               |
| 308.0       | PI        | Cabo Espichel        | Portugal      | D*,Z   |
| 308.0       | RC        | Cabo Roca            | N Spain       | D*,E*,J*,S*,X*,Z                                       |
| 308.0       | RD        | Roches Douvres Lt    | France        | A*,C*,D*,E,G,H,I,J,L,M,P*,Q,R,S*,Y,Z,1,2               |

# SSB Utility Listening

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I've just seen the January edition of this column, and it is full of gibberish! My spelling-checker had run amok and the text doesn't quite make sense. Rather than re-do the whole column with corrections, if you want a corrected copy, please send me a stamped s.a.e. and I'll send you a copy. My apologies to Michael Schulsinger whose name was changed as a result of the spelling check.

## Letters

Stuart M writes from Surrey with details of how he rediscovered his interest in short wave listening. He started with a Lowe HF-150 and a random wire, and quickly moved up to a full-size G5RV and Global a.t.u. Next came the Lowe AT-150 computer interface that makes the HF-150 easier to use. The 'computer' to drive the HF-150 is a Psion Organiser II running a program specially written by himself. His log covers some interesting items heard during the past year, and some of these are included later in the Traffic Log.

Stuart asks if there is any chance of a feature on either the British Army or RAF (or both!) and their use of h.f. communications - I have resisted doing this so far, as once I produce a list of frequencies they are sure to change them. Finally, Stuart asks if I use any bulletin boards - yes I do, I regularly check-out the Fidonet Shortwave Echo available on the Packet BBS (081-547 1479) in south-west London. This contains a lot of interesting information on the broadcast bands and a few interesting 'utility' items.

Mrs Reed from Cheltenham writes and asks that I publish more information on shipping and maritime traffic. She listens to the Traffic Lists

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

- 2.396 in use by Edinburgh Rescue as 5.680 was suffering from QRM. Also used 4.717MHz
- 4.408 USCG weather broadcast reporting 60 knot winds centred on 50(SYMBOL 176 V 'Symbol')N 30(SYMBOL 176 V 'Symbol')W.
- 5.680 Major SAR rescue operation as a result of the crash of a Sea King helicopter between Scotland and Northern Ireland. Involved were 'Rescue 1/12' (two Nimrods from RAF Kinloss), three other Sea King helicopters, three Lifeboats, four fishing vessels and three Merchant ships. Also operating on v.h.f. (156.0, 156.8), u.h.f. (282.8 and Scottish Mill), with the fishing boats using their cell phones. Rescue 51 working with Plymouth Rescue, involved in attempts to recover a yacht adrift in the Atlantic. This was the sad tale of the yacht *Happy Ending* that was reported on TV.
- 5.685 FYY 44 talking to RAF Finningley, gave position as 52°N 56°E (somewhere over Kazakhstan!) at flight-level 50 (5,000 feet) and said that they were changing to their operational frequency.
- 6.712 CTM 5319 (French Air Force transport aircraft) talking with 'Circus Vert'; passed e.t.a. as 0820Z for somewhere in the UK.
- 6.719 Grove Control working Q1Z and 5PX. Grove Control working 64P and 'Broadway 12' discussing arrival of supplies. Royal Navy/FRADU at RNAS Yeovilton in Somerset. The Broadway callsigns is used by aircraft from FR Aviation Ltd at Bournemouth International Airport.
- 6.725 MPD in contact with Nugget 24. Nugget callsigns belong to the DRA at Farnborough.
- 6.729 Talon 81 (MC-130, 7th SOS, RAF Alconbury) working 'Blackcat' on frequency 'D', reporting bad weather at Leuchars, '81 will return to Alconbury.
- 6.735 Ghost 1, Ghost 2 and Swordfish 16 passing target track information to Panther. USCG drug interdiction from the Gulf of Mexico.
- 6.812 SAM 205 (C-20B, 89th Airlift Wing, Andrews AFB) talking with Andrews VIP; phone patches to Shannon Dispatch and Shannon Metro; was told to contact Ops on v.h.f. 131.5 when in range of Shannon. QSYed to channel 96 upper. Frequency for 96 Upper, anyone?
- 8.170 Monarch 2088 talking to Monarch Ops at Luton, via Portishead. '2088 was en-route to Lapland carrying 80+ children and a reporter named 'Mark'. Also heard on 10.960
- 11.176 Navy CF397, phone patch via Ascension. QSYed to 8.993. Which USN squadron uses the callsign prefix 'CF'? Blue 22 (KC-135 operating from Mildenhall) with Croughton; phone patch to 'Banter Control' (Tanker Ops, Mildenhall), '22 reported that they were refuelling CUBE 81 (an EF-111A returning to the USA), and that '81 had an emergency 800km west of Scotland; '81 had returned to Leuchars, escorted by Blue 22, and now '22 was continuing to Plattsburg AFB.
- 11.243 Griff 51 (B-52H) talking to 'Raymond 42' via Offutt GHFS. Where is 'Raymond 42', my list only goes as far as 'Raymond 28'?
- 11.246 Unidentified 'Navy' callsign in contact with 'Primrose Base', asking for weather info. This is the Danish Air Force, 'Primrose' is their h.f. communications centre (similar to Architect) at Vearlose near Copenhagen.
- 13.223 (l.s.b.) 'Salvamento Uno' talking to an unidentified base in Spanish. Probably the Spanish SAR service.
- 13.485 SAM 27000 (VC-137B, 89th Airlift Wing, Andrews AFB) talking with Andrews VIP; '27000 was still on the ground in Damascus, waiting for their VIP to arrive before flying on to Tel-Aviv. Also heard on 11.226, 20.016, 15.015 and 15.018. More Middle East peace negotiations.
- 13.878 SAM 205 (C-20B, 89th Airlift Wing, Andrews AFB) talking with Andrews VIP; QSYed to Channels 148 Upper and 928 Upper to check conditions. Which frequencies are these?
- 16.363 (Marine channel 1602) ship *Morangi Bay*, just off the coast of West Africa. Shore station frequency is 17.245MHz.
- 17.245 HMS Coventry phone-patch to Portsmouth docks, via Portishead.
- 19.510 NATD 38 (RAF/8 Squadron E-3D Sentry) working Portishead Radio with a phone patch to the RAF Hospital at RAF Halton.
- 21.400 Amateur station 8P6QM in Barbados. At 1300UTC each day, the 'Trans-Atlantic Maritime Mobile Net' meet on this frequency.

transmitted by Niton and Stonehaven, and asks if anyone has heard the *QE2* on short wave. Although I have not managed to hear that particular ship, I do know that the callsign to listen for is GBTT. Has anyone heard the *QE2* or any other interesting ships on the maritime bands?

Donald Robson writes from Scotland with an impressive log of airline traffic heard on the aeronautical bands. This includes aircraft operating in the Middle East, Africa, Caribbean and the Far East; perhaps the most interesting is his logging of Vientiane in Laos on 8.942MHz amongst numerous entries

for Bangkok, Hong Kong, Manila and Singapore on the same frequency. Even more remarkable when I mention that Donald's antenna is a just a 20m long end-fed 'inverted L'. Donald is another delighted user of the Lowe HF-150.

## Answers

The report by Geoff Halligey of signals from Qatar has been partially answered by Lee Taylor, Craig Otley and Ray O'Keefe, who point out that the callsigns 'Mary 2' and 'Mary 3' are really 'Amiri 2' and 'Amiri 3' respectively. The aircraft concerned are operated by the Government of

Qatar from Doha, but used by the Royal Flight. 'Amiri 1' is a Boeing 707, 'Amiri 2' is a Boeing 727 and 'Amiri 3' is another Boeing 707. There are also two Falcon 900's - Amiri 4 and 5. Craig says that he has heard 'Amiri' aircraft asking Speedbird London to ask their Ops to listen on their frequencies.

From this issue onwards I would like to present each month a selection of items from the logs that I receive. These will give you an idea of the signals that others are listening to, and also the amount of detail that others provide in their reports. I would like to expand this section, so I am relying on your reports.

|       |    |                    |             |  |
|-------|----|--------------------|-------------|--|
| 308.5 | NZ | St. Nazaire        | France      | D*,E*,G*,J*,1                              |
| 309.0 | AR | Alte Weser Lt      | N Germany   | 2  |
| 309.5 | BA | Punta Estaca Bares | N Spain     | A*,C*,D*,E*,G*,I,J,R,S*,T*,V*,X*,YZ,1,3    |
|       |    |                    |             | YZ,1,3                                     |
| 309.5 | FH | Fruholmen Lt       | Norway      | E*,J                                       |
| 309.5 | MA | Marstein Lt        | Norway      | C,O*,E*,G*,I,J,K,Q,T*,1*,3                 |
| 309.5 | WE | Wangerooze Lt      | N Germany   | E*   |
| 310.0 | BO | Boulogne Sur Mer   | W France    | E*   |
| 310.0 | ER | Point de Ver Lt    | N France    | A*,D*,E*,G*,J*,L,M,P*,Q,R*,YZ,1,2          |
| 310.3 | GV | Goltur             | Iceland     | J*,Q                                       |
| 310.5 | SG | Sjaellands N Lt    | Oenmark     | C*,E*,3                                    |
| 311.0 | GD | Girdle Ness Lt     | NE Scotland | B*,C,E*,I,J,K,T*,X                         |
| 311.0 | NP | N Foreland Lt      | Kent        | O*,G,H,J,L,M,O,Q,R*,S*,U*,Y,1,2,3          |
| 311.5 | LF | Loop Hd Lt         | Eire        | A*,D,E,G,X,1*                              |
| 312.0 | HO | Tennholmen Lt      | Norway      | E*,J*                                      |
| 312.0 | OE | Oostende           | Belgium     | C*,D*,E*,G*,H,I,J,K,L,M,N,O,R*,S*,U*,Y,1,3 |
| 312.0 | JH | Eckmuhl Lt         | France      | D*,E*,G*,Z                                 |
| 312.5 | AK | Akmenrags          | Latvia      | E*,I,T*,3*                                 |
| 312.5 | BK | Baltijsk           | Latvia      | C*,E*,I,1*,3*                              |
| 312.5 | BT | Mys Taran Lt       | Latvia      | C*,E*,I,J*,T*,1*,3                         |
| 312.5 | CS | Calais Main Lt     | France      | C*,E*,J,S*,U*,1,3                          |
| 312.5 | KA | Klaipeda Rear Lt   | Lithuania   | E*,I,S*,3*                                 |
| 312.5 | LB | Liepaja            | Latvia      | C*,E*,I,3*                                 |
| 312.5 | VS | Cabo Estay Lt      | N Spain     | I  |
| 312.5 | VW | Ventspils?         | Latvia      | I*,T*                                      |
| 312.6 | SR | Skardhsfjara Lt    | Iceland     | E*,G*,J*,J*,3*                             |
| 313.0 | HA | Halten Lt          | Norway      | E*,I,K*,T*,V,3                             |
| 313.0 | PA | Cabo de Palos Lt   | S Spain     | G*   |
| 313.0 | PB | Portland Bill Lt   | Dorset      | A*,D*,E*,G*,L*,M,O,R*,S*,YZ,1,2,3          |
| 313.0 | TY | Tory Is Lt         | N Ireland   | C,E,I,N,P,T*,X                             |
| 313.5 | CM | Cromer Lt          | Norfolk     | B*,C,D*,G,I,K,L,Q,S*,T*,U*,Y,1*,2,3        |
| 313.5 | OG | Olands Sodra Grund | Sweden      | E*,I*                                      |

|       |     |                     |           |  |
|-------|-----|---------------------|-----------|--|
| 313.5 | PQ  | Porquerolles        | S France  | E*,Q   |
| 314.0 | HK  | Hekkingen Lt        | Norway    | E*,J*  |
| 314.0 | PQ  | Porquerolles Lt     | S France  | G*,J*,J*,Z   |
| 314.0 | VG  | Ile Vierge Lt       | France    | A*,B*,C,D*,E*,G*,I,J,K*,L,M,P*,R*,S*,T*,U*,V,X*,Y,Z,1*,2,3*      |
| 314.5 | TL  | Punta della Penna   | Italy     | D*,E*,I*   |
| 315.0 | SL  | Sletterrhage        | Denmark   | A*,B*,C*,D*,E*,G*,J*,J*,K*,L,O*,Q,R*,S*,T*,U*,V,W*,X*,Z,1*,2*,3* |
| 316.0 | IN  | Ingollshofdhi Lt    | Iceland   | D*,E*,J*,J*,3*   |
| 319.0 | LEC | Stavanger           | Norway    | A*,B*,C,D*,E*,G*,I,K*,L,M,N,O*,P*,Q,S*,T*,U*,V,W*,X,Y,Z,1*,2,3   |
| 372.0 | OZN | Prins Chris's Sund. | Greenland | D*   |
| 381.0 | AB  | Akraberg            | Faeroes   | D*   |

Note: Entries in bold are calibration stations. Entries marked \* were logged during darkness. All other entries were logged during daylight.

**D Xers:**

|   |   |   |                                     |
|---|---|---|-------------------------------------|
| A | Darren Beasley, Bridgwater.             | P | Sid Morris, while near Aberystwyth. |
| B | Leslie Biss, Knaresborough.             | Q | John O'Halloran, Harrogate.         |
| C | Kenneth Buck, Edinburgh.                | R | Fred Pollant, Storrington.          |
| D | Steve Cann, Southampton.                | S | Peter Pollard, Rugby.               |
| E | Robert Connolly, Kilkeel.               | T | Peter Polson, St. Andrews.          |
| F | Geoff Crowley, Hafnarfjordhur, Iceland. | U | Peter Rycraft, Wickham Market.      |
| G | Viv Doidge, Gunnislake                  | V | Tom Smyth, Co Fermanagh.            |
| H | John Eaton, Woking.                     | W | Ned Stephens, Accrington.           |
| I | Chris Edwards, Inverurie.               | X | John Stevens, Largs.                |
| J | Jim Edwards, Wigan.                     | Y | Philip Townsend, E London.          |
| K | David Edwardson, Wallsend.              | Z | Ern Warwick, Plymouth.              |
| L | Gerry Haynes, Bushey Heath.             | 1 | John Wells, E Grinstead.            |
| M | George Millmore, Wootton, IoW           | 2 | Peter Westwood, Farnham.            |
| N | Albert Moore, Douglas, IoM.             | 3 | Michael Wright, Hoyland.            |
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Newcomers are not the only readers to be confused by the jargon of flight. Because information is repetitive and has to be conveyed quickly by radio, so much relies on abbreviations and context. Elsewhere in this special aeronautical issue you'll find an article that I have written to try to disentangle all those numbers with which pilots fill their speech. Questions and feedback via this column please.

## Help Please!

Peter Wade (Sevenoaks) is better known for his contributions to the satellite imaging columns. He sent a copy of *Remote Imaging Group Journal* (No. 35) in which David Watson (University of Leicester) describes a strange appearance on two consecutive pictures from NOAA 11, early afternoon, 15 April 1993. Despite cloud cover elsewhere in the picture, the south-eastern corner of England is clearly seen. Stretching from the Thames Estuary, along the east coast to Great Yarmouth, and then continuing onwards as far again over the North Sea, is a helical pattern. The pattern is more distinct over the sea, tending to break up over the land. Between the two pictures (100min apart) the pattern changes slightly and drifts south-east at 6kt.

What is it? Two aeronautical theories are vortex wake and condensation (vapour) trail. Assuming that this pattern was made at trailing altitude, comparing its projection on the ground with a feature of known size (The Wash), and by the method of similar triangles, I estimate one turn of the helix to be over 21nm in diameter. This is vast when compared to a vortex wake (the latter being contained within a few hundred metres at the most).

At jet aircraft speed, one turn would have taken over 8min to produce; 10 distinct turns are simultaneously visible over the sea alone. By the time an aircraft reached the terminus of the pattern, vapour deposited at the beginning of the trail would usually be long gone. I'm surprised that so much is still visible 100min later in the next picture! David Watson thinks that conditions were specially favourable for trail persistence on that day. Adjustment of the picture contrast shows other linear tracks that could also be long-lived trails from other flights. What are your theories?

## Follow-Up of a Foul-Up

In February, 'Airband' reported another instance of an arrival landing on taxiway 2 at Gatwick when the northern standby runway was in use. In fact, according to the official source (AAIB Bulletin 12/93, ref: EW/C93/10/4) 9H-ABA was cleared to land on 26R and, despite correct aerodrome lighting, the experienced crew still managed to convince themselves that the taxiway was the place to aim for. No harm done - this time.

A reminder to all. Runways have bright white lights; combinations of edge and/or centreline lights are found at airports of varying sizes. Taxiways have green centreline and blue edge lights. Always. Runways - never! In order to gain from the experience, the authorities are investigating what further improvements can be made to Gatwick's runway lights in order to prevent a recurrence. That's what accident investigation is all about.

## You Write

Accident prevention is, of course, better still. The local airfields near John Fogg G3PHZ (Leighton Buzzard) are Dunstable and Cranfield. Both have gliding activity. John warns of the hazards of driving a vehicle onto such aerodromes without clearance. The trouble, John, is that the launch cables aren't easy to see when lying in the grass. The winch is at one end of the field, the glider at the other. Imagine what could happen if a vehicle drove onto a cable just as the still-distant glider lifted off!

Lockheed SR-71 Blackbirds were once flown on high-altitude spy missions. Darren Bruton (Birmingham) will be interested to know that their engines were a cross between a conventional jet and a rocket, enabling high-speed flight in rarefied air making it harder for the 'enemy' to detect them. Many have ended up in museums in the States, but does anyone know of one over here? Readers in Darren's area would find a visit to the RAF Museum, Cosford, of interest and you can ring for details on (0902) 374112.

In order to rescue troops (or



DC-10 in the tanker role. Taken at Mildenhall Air Fete 1993 by Christine Mlynek.

downed pilots) from enemy territory the USAF operate low-flying helicopters. In peace-time they still keep in practice. Philip (RAF Retired, Northants) notes that they've been doing this at night in his area - and some residents have voiced their disapproval in a local paper.

Low-level sorties generally keep radio silence for security - and anyway, they are too low to transmit any distance back to a controller. Navigation is visual, by self-contained inertial references, or satellite Global Positioning System (that involves receive-only by the aircraft). Night-flying without lights should normally only take place in assigned danger areas, of which there are none near Northampton. Temporary restricted airspace might have been used instead but I didn't see any promulgated by A/C. Perhaps it was NOTAMed? The justification for training in Britain (rather than the USA or Canada) is, I believe, its closer similarity to other parts of Europe where real hostilities might occur. The supposed threat from the Eastern Bloc, however, appears to have subsided.

Anne Reed G.20126/RS.87871 (Cheltenham) reports a non-event. A Concorde was scheduled to circumnavigate the globe in record time starting on New Year's Eve, routing from Paris to Bahrain, Bangkok, Guam, Honolulu, Acapulco, Bermuda and back to Paris. One advantage is two New Year's celebrations but the price of nearly £17000 is a little daunting. In the end there were too few takers and the trip was cancelled.

One important point. Anne received information from the Concorde Society, run by Goodwood Travel Ltd. of Canterbury. Membership was by annual subscription. I am now told that this Society has been disbanded, although I don't know what effect (if any) this might have had on the travel company.

## Information Sources

Tim Christian (157 Mundesley Road, North Walsham, Norfolk NR28 0DD) presents his thoroughly-researched booklet *World HF Aeronautical-Mobile R/T Frequency Allocations* that is brought up-to-date with a 1993 appendix. All known allocations are listed in frequency order and a map of the h.f. circuit areas is included. Existing purchasers can update by buying the appendix alone (£2.00) or you can have the whole work for £6.99 (prices include UK postage, cheques payable to Isoplethics). For overseas postage I suggest you add an extra 83p (appendix only) or £1.57 (whole book).

For more details on flight arrival information as transmitted by satellite teletext services, take up the offer of Ian Doyle (114 Barton Lane, Eccles, Manchester M30 0FG). A stamped reply envelope plus remittance of £2.00 will get you Ian's information on the subject. I briefly mentioned this service last month and also in past issues.

## VFR in the London Zone

There are so many light aircraft flights in the London zone that L Meadows (Chiswick) is getting worried as to how they are all controlled. Some of those proliferating local radio stations want their own observation flights to bring up-to-date traffic reports. Genuine emergencies are assisted by medical evacuation helicopters and police helicopters also perform various duties.

These flights are handled just as any other light aircraft in the area. Penetration of the Control Zone itself is possible by calling Special VFR, a radar service on 119.9MHz. The problem is that clearances are for low levels, often not above 1000ft altitude, and this restricts where single-engined aircraft can go. They must be near

**Chevron microlight  
at the PFA Rally,  
Wroughton 1993.  
Taken by Christine  
Mlynek.**



open country for a forced landing in the event of engine failure. Just outside the Zone, these flights often work Thames Radar 132.7MHz. When medical evacuation helicopters operate near light aerodromes, a courtesy call is also advisable. An example is the helipad at the Royal National Orthopaedic Hospital, Stanmore; when bringing in spinal injuries etc., a call to Elstree on 122.4MHz is helpful.

Low operations are possible under the Heathrow approaches, as long as the helicopter doesn't interfere with the 3° glide slope. Remember that this rises 300ft relative to the ground for each nautical mile away from the threshold.

I'm not sure what frequency L Meadows intends by 119.7 as Heathrow is on 119.725MHz. In general, could readers refer to facilities by name (e.g. Heathrow Tower) as well as frequency - otherwise I can't tell which station you mean! Now, there's a new national frequency for helicopters and I'll explain all about it.

### Frequency and Operational News

A/C 177/1993 from the CAA introduces a new concept: Departure Communication or DEPCOM for helicopters (122.95MHz). The advantage of a helicopter is that it can land at small, remote sites, not intended for aeronautical purposes and certainly not equipped with a ground radio station. At such locations, helicopters may transmit their departure intention on the frequency in case another machine is about to arrive. Arrivals should listen out on the frequency but may not transmit.

With the closure of the air base, the Upper Heyford Mandatory Radio Area ceases. This was an anomaly, not exactly controlled airspace but requiring co-ordination by radio. Some light airfields were enclosed in the area, and there were even exceptions made by way of access lanes to certain of these. Will they

also remember to remove the road signs that are found all round the area and warn you of low-flying aircraft?

The next three deadlines (for topical information) are March 11, April 15 and May 13. Replies always appear in this column and it is regretted that no direct correspondence is possible. All letters to 'Airband', c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS. Genuinely urgent information / enquiries: 081-958 5113 (before 2130 local please).

### Abbreviations

|       |                                    |
|-------|------------------------------------|
| AIB   | Air Accidents Investigation Branch |
| AIC   | Aeronautical Information Circular  |
| CAA   | Civil Aviation Authority           |
| ft    | feet                               |
| h.f.  | high frequency                     |
| kt    | knots                              |
| MHz   | megahertz                          |
| min   | minutes                            |
| nm    | nautical miles                     |
| NOTAM | NOTice to AirMen                   |
| R/T   | radiotelephony                     |
| USAF  | United States Air                  |

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# Scanning

Alan Gardner  
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**M**y thanks to all those readers who have written in with further information on the subject of Radio and TV outside broadcast communications. **Jack Mullen** of Surrey pointed me in the direction of a DTI Radio-communications Agency information leaflet (RA135) entitled *Ancillary services for independent programme making. Information Sheet: General*. This describes the frequencies available for various radio devices used in programme making for radio, television, films, advertisements, videos and other events allied to the entertainment industry. These can include equipment for talkback, cueing, audio links, video links, radio microphones, data and remote control links.

The frequencies mentioned in the leaflet are administered on behalf of the DTI by a company called ASP Frequency Management Ltd. They co-ordinate the use of the limited number of channels available and issue the licences. Users of these frequencies are likely to be independent production companies making programmes for the national networks (for whom many employees of the new companies used to work). This usually entails only short periods of work on location, which could be almost anywhere in the UK or Europe. For this reason, the frequencies tend to only be used for a limited period before they are reallocated to another company.

On the other hand, the BBC and major independent radio and TV companies have their own separate blocks of frequencies that tend to be allocated on a shared basis with other users such as the MoD, this is because they have a continuous requirement for radio communications and are generally confined to fixed geographic locations.

Another reader with an interest in outside broadcasts is **Allen Francis** of Birmingham. He often hears the BBC setting up television outside broadcast links over a very wide area using what he believes to be a base station at Sutton Coldfield operating on 78.225MHz. He also sent me details of frequencies (obtained from a Packet Radio BBS) that are used by the BBC for local radio station outside broadcast links, which he notices have gradually moved away from u.h.f. to segments of Band III, presumably because of pressure from commercial users.

**Bert Tisbury** of South Yorkshire and **A Johnston** of Humberside both enjoy listening to horse racing commentaries from the many race courses within monitoring distance. The 455MHz band seems the most

popular choice for this purpose but occasionally 141 and 78MHz channels can be heard. Bert comments that he has yet to hear any inside information that could be used to advantage! But he does find the off-screen comments between the director, camera operators and commentator amusing at times.

## Flying Saucers

You may remember some time ago I mentioned a story about the police in Cheshire setting up a fake UFO landing in order to catch scanning enthusiasts who were monitoring their transmissions (the police not the aliens). Well, those little green men have been sighted again according to a report in the *Guardian* newspaper, which was subsequently repeated with additional errors on Ceefax. This time the Yorkshire police have been credited with trapping several scan fans, who during 'Operation Marconi' were lured to a remote area by fake radio reports of crashing objects and high levels of radiation. It sounds to me like anyone turning up at such a scene needs locking up for their own safety!

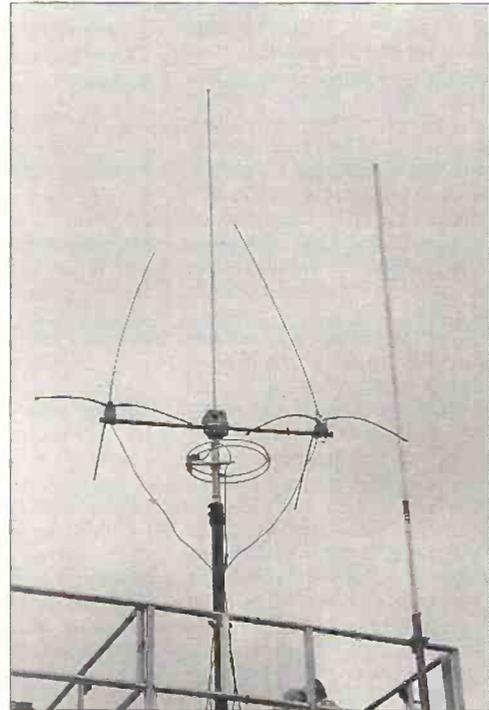
Now you may call me sceptical, but this story has resurfaced several times during the past year, including fake sightings in Holland and Lincolnshire. A very similar story line featured in one episode of the ITV series *Harry*. I would think that this story will re-appear at least one more time, so keep your eyes on the heavens and the pages of your local newspaper for the next sightings, and don't believe all you hear (or read).

## Marine Communications

**Jeff Dryburn** of Dorset is a keen sailor and often monitors the v.h.f. marine band. Whilst looking through one of the frequency guides he spotted an international u.h.f. allocation for on-board ship use at around 467MHz. He has never heard any activity on the channels listed and wonders what they could be used for.

Well, this one does seem to be a bit of a mystery. I have asked a few people with maritime connections but none of them were aware of the frequencies. However, I think the origin of the allocation is probably American as an old US frequency listing I have features the same channels, with a few additional ones either side, as being used for dockside and cargo handling purposes. It may be that the channels were originally used for cargo handling operations on-board

## Selection of antennas used during a Radio One Roadshow



ship but this may now have been extended to security/safety communications between personnel on large passenger vessels such a cruise liners, where it may be confusing to use the normal v.h.f. marine band in situations such lifeboat drills, etc. I know that the frequencies have been used in the UK at some stage because I once bought a box full of u.h.f. hand-held transceivers operating on these channels at a marine auction.

Are there any sailors out there who can shed further light on the mystery?

## Keeping Track

**Andy Middleton** has sent me details of an interesting piece of software he has written to run on the Atari ST. The shareware program is aimed at scanner users who just tend to monitor one type of radio traffic such as airband or marine communications. The purpose of the program is to help keep track of callsigns, times and movements. For example, when you hear a particular callsign being used you can enter it into the program along with any comments, for example: Concord 3, 1137, Oceanic Clearance. This quickly builds up into an extensive operational log of callsigns. This is great if you are an aviation enthusiast, but I am equally sure that other scanner owners will find additional uses for it. If you own an Atari ST and would like a copy you can send £5.00 to: Andy Middleton, 89 Crediton Road, Okehampton, Devon EX20 1NU.

## What Is It?

As a result of mentioning the increasing number of digital transmissions appearing throughout the radio spectrum, several readers have asked me to try and identify strange signals that they have heard. The first request for help comes from **Frank Holton** of Merseyside. He has monitored strange melodic tones at various time of the day and night on frequencies around 403MHz. Attempts at direction finding have proved difficult and he wonders if it is some sort of satellite he is hearing.

Well I don't think so Frank, but you are nearly correct, I believe what you are hearing is a meteorological sonde. These are small low power transmitters that are attached to helium filled balloons. They tend to be launched at regular intervals from various locations around the UK such as the meteorological office site at Hemsby in Norfolk. The progress of the balloon can be tracked by radar as it also carries a light-weight reflector as well as the active electronics module.

Radar plots can be used to determine wind speed and direction at various heights, whilst other parameters such as air pressure (and height), temperature and humidity are signalled back by means of the audio tones you can hear. As the balloon increases its altitude, the helium pressure inside the balloon expands the envelope (because of the reduction in the outside air pressure) to such an

extent that the balloon bursts. A parachute ensures that the transmitter gently falls to the ground - where some lucky person obtains a gift from the gods.

A Smith of West Sussex has been hearing strange chattering noises in various places in the u.h.f. band, he thinks that they may be coming from the continent but he can't think what sort of purpose they could be used for. The most likely answer is that the signals are part of a French position fixing system called 'Syledis'. This uses synchronised pulsed signals transmitted from several fixed locations to provide accurate positional information for mobile stations.

Typical 'Syledis' centre frequencies include 408, 419, 432, 438, 442.25 and 445.25MHz and the main users of the system tend to be oil exploration companies who need to know where they are to a high degree of accuracy. The system does have one major disadvantage however, which is the transmissions being of a pulsed nature tend to spread over quite a large frequency range. This can cause interference problems to other communications systems, and UK radio amateurs in particular are well aware of 'Syledis' operation within the 430MHz amateur band. Fortunately, the system is now starting to be phased out in favour of satellite navigation or more accurate land-based microwave beacon networks.

John Gebbie of Cumbria has sent me a cassette recording of sounds similar to random notes on an electronic organ with 'pip' tones between groups. He has heard these on frequencies around 87.425MHz and wonders what they are. I'm not too sure about this one but my first guess is that they form part of a radio linked telemetry system. The block of frequencies they lie in tend to be used by local councils or community nurses so it could be some form of wide area radio alarm or paging system. Does any one out there have any better ideas?

Once again my thanks to all those readers who have contributed to the column. If you have a question or information you would like to share why not drop me a line. Until next month - Good Listening.

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# Info in Orbit

Lawrence Harris  
5 Burnham Park Road, Peverell, Plymouth, Devon PL3 5QB

**D**uring both December and January, weather remained a prime talking point. In common with many 'Info' readers, I spent a considerable time monitoring UK weather (we were suffering excessive rain) and that of Australia (drought and fires). I used the animation facility on my software almost daily, monitoring bands of rain clouds as they came off the Atlantic, one after the other.

It does appear that the short-term forecasting one can do from two or three METEOSAT pictures can sometimes be more accurate than official forecasts. On occasions, national TV forecasters have shown Devon under heavy rain - while we were actually enjoying a rare sunny day.

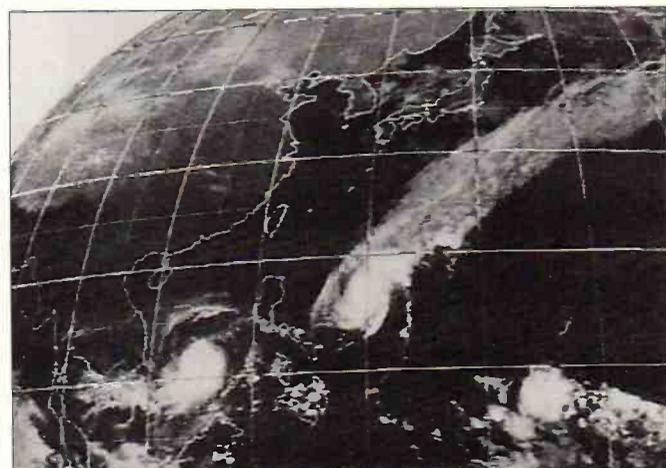
This month sees the start of a new regular feature - PDUS and h.r.p.t. - the ultimate in WXSAT images. I will be interested to hear readers' comments, views and suggestions. A few correspondents have asked for construction projects to be provided. I'll bear this in mind.

## Current WXSATS

The CIS WXSAT METEOR 3-5 continued to transmit visible images on 137.30MHz during its morning ascending passes over Britain in January. As these passes became earlier each day, the WXSAT eventually ceased transmissions, even before passing over the UK. Because it was travelling near to the morning terminator, we could clearly see the curved illuminated earth below. It showed dramatic lighting of the clouds.

Watching the aperture bar indicators, those varying black and white bars on the side of the image, one could anticipate quite accurately just when transmission would cease. Picture quality was not as good as when seen under conditions of better illumination. Streaks at irregular intervals

Fig. 2: GMS WEFAX infra-red image December 7 from Frank Slater.



covered the image. Because METEOR 3-5 was not transmitting infra-red during its passes through darkness, I did not receive any transmissions during its evening passes. By January 20, I could not monitor it.

The only other CIS WXSAT operating was METEOR 2-21 on 137.85MHz. It had not been in daylight (over Britain) for some weeks, so I could not receive its signals. Using one of my satellite tracking programs I advanced the date in order to see when it would next be in sunlight over the UK. January 1 was the result and at 1445UTC there it was! Travelling northbound over Africa in sunlight, I heard it for a few minutes just before it entered darkness over Europe. During following days the situation improved and transmissions lasted longer.

The NOAA WXSATS continued normal operations with no surprises. Using multi-satellite tracking software, one can find those times when the paths of NOAAs 10 and 12 overlap. During these times NOAA 10's a.p.t. (on 137.50MHz) is switched off. Similar operations affect NOAAs 9 and 11 on 137.62MHz. On occasions, their respective beacons can be heard on 136.77 or 137.77MHz showing that they are still operational. The beacons contain considerable information including TIP (Tiros Information Processor) data. Perhaps a short feature on this might be of interest.

## Future Launches

METEOSAT-3 is positioned at about 75° west longitude for imaging the USA as part of its weather monitoring programme. This WXSAT is very low on manoeuvring fuel and will be replaced by METEOSAT-5. A more permanent solution should arrive around April 15 when GOES 1 is scheduled for launch.

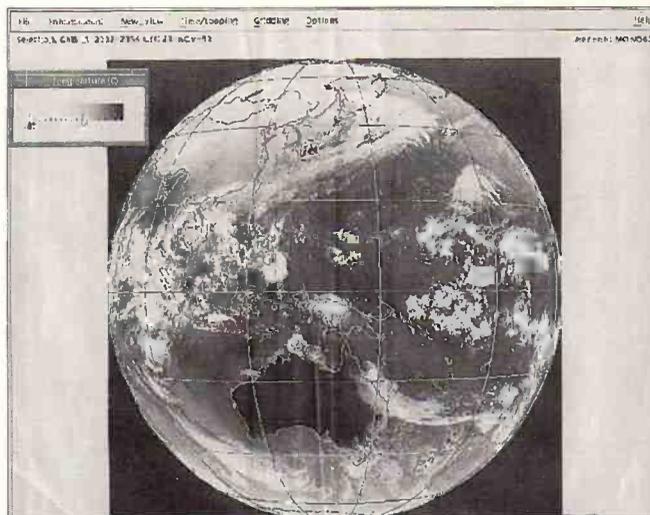


Fig. 1: GMS PD infra-red image November 23 from Steve Rawdon of Wellington.

## GMS

Apart from METEOSAT-4, which currently transmits both Primary Data and WEFAX images to users from geostationary orbit above longitude 0°, we can also receive images originating from METEOSAT-3 (positioned over longitude 75° west), and also from GMS-4 (positioned near Australia), all of which are re-transmitted by METEOSAT-4.

The Meteorological Service at Wellington airport in New Zealand receives direct digital images from GMS (geostationary meteorological satellite) and Steve Rawdon, who works there, has kindly sent me a further whole disc image - see Fig. 1. This infra-red picture is dated 23 November 1993 and is from the 2332 to 2355UTC slot. Australia is very dark (hot) as would be expected from a local mid-day image. Tropical thunderstorms and typhoons are seen near the equator.

Frank Slater of Spalding sent Fig. 2, a re-transmitted WEFAX infra-red GMS A-format image. This features typhoons near China, Korea and the Philippines as seen on December 7 around 1930UTC. Frank comments that the land masses of Japan and the Asian coastline are clearly visible in infra-red due to the marked land/sea temperature contrast at this time of year. Frank's equipment includes a home-made loop-Yagi antenna (to receive the 1691MHz carrier from METEOSAT-4), feeding a Dartcom down-converter and receiver and PROsatll software.

Chris Smith of Lincoln spotted the moon on a GMS-4 image on January 2 and sent me a copy of the image. He wondered whether such things are normally edited out before transmission. I believe that only ESA METEOSAT images are edited in this manner. Chris had originally been monitoring typhoon activity in Australasia, using the autosave facility to store the GMS images.

## Beginners

I receive many letters from new readers of this column, requesting basic information on receiving WXSATS. At the risk of sending those with more experience on to the next column, perhaps this piece will provide some guidelines.

## The Bands

Almost everyone has a domestic radio. Such receivers often have a number of bands, ranging from short wave up to f.m. (88 to 108MHz). Each contains broadcasts of similar type, from RTTY and other utility transmissions, (that are heard all over the lower frequency bands) up to the high quality radio broadcast bands, that have wide bandwidths, positioned in the 88MHz region.

Situated a little further up the radio spectrum, is the first part of the WXSAT band - that between 137 and 138MHz. Any receiver that can tune to this band, and has some form of external antenna - even a long wire - will be able to hear several WXSATS when they pass above the local horizon. There may be up to four American WXSATS and perhaps two CIS WXSATS in operation during the day (see Frequencies).

We can easily monitor WXSAT operations without any further decoding of the signal. Just wait, preferably outside, with a hand-held scanner fitted with a rubber duck, and along they will come! If you obtain a tracking program to run on your computer you can predict arrival times for each WXSAT. Be warned - this becomes addictive. Suddenly you are able to positively identify each transmission, and perhaps even estimate when the CIS satellites will switch off!

At this stage you can listen carefully to the signals and experience fades. You then notice certain parts of your local horizon restrict the signals. You may hear characteristic types of interference. A conventional receiver is not designed to reject paging QRM, so you will hear this at regular intervals. Such simple monitoring using 'already-to-hand' equipment can allow you to acquaint yourself with the WXSAT scene.

Several readers, including John Fitzsimons of Sligo (Republic of Ireland) have monitored satellites in this way for a long time. John's scanner is fed by a Discone, and he can monitor MIR, amateur radio satellites, the NOAAs and METEORS and all of the NAVSATS in the 149MHz band. John tells me he was with Martin EI3FI last September when they had a two-way contact

with Alexander Serebrov aboard MIR. Subsequently, he also spoke to Musa Manarov on MIR, and Owen Garriot on STS Columbia. Owen actually dates back to the Radio and Space Research Station at Slough (now no longer in existence) where he worked at the time that I was also employed there. John sent me a night-time picture of him holding the antenna while they followed MIR - unfortunately it was unlikely to reproduce well.

If you don't have a receiver of any type for this band, you will have to decide whether you wish to build one yourself, using a commercial kit (such as Cirkit), or buy an off-the-shelf purpose designed receiver. Although I have enjoyed a few construction projects myself (I built a framestore!) I would not personally recommend that course unless you have a variety of test equipment for aligning the electronics. I had to keep popping into the local radio club to beg assistance when my framestore neared completion.

## RIG

A recent edition of this column gave the wrong address for RIG membership. The correct address is: Ray Godden G4GCE, Wayfield Cottage, The Clump, Chorleywood, Herts WD3 4BG.

## More Letters

A number of readers have sent me images on disk. I can view these myself, and they are usually of good quality, but unfortunately there is no facility for them to be incorporated, in this format, within the column. I cannot print quality images on my dot matrix printer. All submissions must remain hard copy; pictures are then scanned (in the Editorial Offices) and sized to fit the space available. After a period of time the pictures are returned to me and I then return them (or possibly stick them on my wall!)

Andy Freeman of Wallasey recently set up a WXSAT receiving station based around his 486 PC. Signals are received via a Cirkit

crossed-dipole antenna feeding a Cirkit receiver. He uses Timestep's VGASAT4 software. Andy has found the infra-red pictures to be satisfactory but mentions the low light level of the visible winter images. He sent me Fig. 3, a NOAA 12 image of Britain and Europe, taken at 0812UTC on November 25. He used histogram equalise to raise the image brightness before screen photography.

At the time of writing, Andy noted the few METEOSAT transmissions that were available. As mentioned at the beginning, recent transmissions have only been during sunlight passes, so have been limited.

Geoffrey Chance of Redruth comments on the difficulty in buying a high quality bubble-jet printer without having the opportunity to try it first. I believe that certain stores may allow you to try such equipment before purchase - may I mention Argos?

Post for this column falls into definite categories; several dozen requests for Kepler elements arrive each month, mostly for the WXSATs and MIR; several more request elements for other satellites. All these are dealt with within a day or so. The next group are those requesting simple information, and (where an s.a.e. is enclosed,) are dealt with almost immediately. A few provide a long list of questions which, if dealt with individually, would take me a day to reply. I usually incorporate these into the column when appropriate.

## BBS

In addition to those BBS (computer Bulletin Board Systems) that provide Kepler elements for WXSATs, and have been mentioned in previous months, I have been asked to mention Prometheus, a Viewdata-protocol BBS dedicated to astronomy and space-related material. The number is 081-300 7177. Unfortunately I have been unsuccessful during attempts to log on to this board. Maybe others will have more luck.

## PDUS and HRPT

Primary Data (PD) from METEOSAT and high resolution picture transmissions (h.r.p.t.) from the NOAA WXSATs form the top end of direct image reception and monitoring available to the amateur. From this edition, I hope to produce a regular slot for these topics, not so much to titillate the palette, but really to keep readers up-to-date with developments.

I operate a Timestep PDUS system myself and know of others who use either this or other hardware. At least one reader built his own system. Where appropriate I will give pricing or contact information.

## Primary Data User Station (PDUS)

A glance at the transmission schedule issued by ESA shows that METEOSAT-4 uses two separate frequencies for disseminating image data. WEFAX transmissions are mainly on 1691MHz, with a few extra WEFAX images also disseminated on 1694.5MHz. This latter carrier frequency is used mainly for transmitting digital (primary) data. If you have been operating a WEFAX system it is worth checking that you continue to receive good data on channel A2 as well as the usual A1. My first unit (a down-converter) contained a faulty crystal so for many months I did not know that reception of whole disc images (the DTOTs, etc.) was possible. WEFAX reception is discussed regularly in the column so this section will concentrate on Primary Data.

Our interest is mainly image decoding but it is worth appreciating that METEOSAT also provides a number of meteorological services using other frequencies. These transmit encrypted data for the professionals, and as many readers are aware, encryption is slowly creeping up on us all!

Although both WEFAX and PD use similar equipment, i.e., a dish, pre-amp, receiver and decoding board (that fits in the computer), the true resemblance is minimal. The equipment specification for quality reception of primary data is of a much higher level.

## Specifications

We should look first at the official specifications. EUMETSAT state that an SDUS (secondary data - WEFAX - user station) requires a 'basic performance figure (G/T)' of 2.5dB/K, with 10.5dB/K for PDUS equipment.

Using more easily appreciated terms, the minimum specified dish sizes are 1.8m for WEFAX and 2.4m for PDUS. These sizes allow for a nominal received signal strength from the WXSAT, and also for a specified antenna beamwidth. Further explanation is needed!

Currently METEOSAT-4 is transmitting at a higher power (signal strength) than its nominal value, so smaller dish sizes can suffice. On some occasions, such as

during late January, both METEOSAT-4 and 5 or 6 were transmitting carriers using identical frequencies. If your dish is below the specified size, it will receive both signals due to the increased beamwidth, and therefore some interference will be experienced. In practice I would be surprised to hear of anybody who actually operates a dish larger than 1m for WEFAX reception. My own PDUS dish is about 1.8m diameter.

It is worth bearing these specifications in mind for the future. The progress of digital electronics should ensure that even below-specification hardware will produce satisfactory results for most of the time. I could not accommodate a full-size PDUS dish in my back yard!

## Kepler Elements

There is an interest in monitoring many different types of satellite. Following several requests for disk files I am now offering a new service to provide Kepler elements on disk for those who wish to input data without the need for typing entries. If you wish to receive data in this form please send me a disk with £3, and I will provide two ASCII files, one containing just WXSAT elements, the other containing a large list of regularly available satellites. All data is in NASA two-line element format.

Alternatively, I can send a print-out of the latest elements upon receiving an s.a.e. and extra stamp. All known weather satellites plus MIR can be included, together with transmission frequencies if operating. All data originates from NASA.

## Late News

Early on 25 January we heard the first signals from the new CIS WXSAT METEOR 3-6, transmitting good quality (reversed grey-scale) infra-red on 137.30MHz. This suggested a southbound pass, because it was obviously coming over the dark north pole. Within a minute or two we saw visible imagery, a stable picture, on a far easterly pass, so probably the first of the day.

The second pass, around 1320UTC, was at a much higher elevation and careful examination of the visible-light image showed it to be of high quality.

I was about to construct 'dummy' Kepler elements for the WXSAT when a call from Timestep Weather Systems informed me that they now had them on their BBS! Well done! (Timestep's BBS can be accessed 24 hours a day by anyone with a telephone modem on (0440) 820002 using the standard 8-n-1 settings. Licensed Amateurs can also retrieve Kepler sets from Packet Radio BBSs.- Ed)

## Frequencies

NOAAs 9, 11 a.p.t. on 137.62MHz; NOAAs 10, 12 on 137.50MHz; NOAA beacons on 136.77 and 137.77MHz; METEOR 3-4 or 3-5 on 137.30MHz & METEOR 2-21 on 137.85MHz.

Fig. 3: Britain and part of Europe from NOAA-12 November 25 from Andy Freeman.



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# Decode

Mike Richards G4WNC  
PO Box 1863, Ringwood, Hants BH24 3XD

**E**gbert Hertsen of Mechelen in Belgium is just getting started with utilities and would like to use his ageing Commodore C-64 computer. The main source of software for the C-64 is through programs developed for amateur radio. A good starting point is J & P Electronics, Unit 45, Meadowmill Estate, Dixon Street, Kidderminster DY10 1HH, Tel: (0562) 753893. Not only can they supply software for the C-64, but they have packages available for Spectrum, VIC20, C-16, +4, Amstrad 464/6128, MSX1, BBC B, Dragon, Atari 400/800 and Atari ST/STE. All of these packages are very reasonably priced. If you have any information regarding software for some of the less common computers please write with the details.

**Wilson Convery** of Norwigh uses an old Creed teleprinter to receive RTTY broadcasts. The only problem being that he gets through large quantities of paper whilst trying to find 50 RTTY signals. He has written to ask if I know of a device that can monitor the received signal and indicate the baud rate of a signal. Other than using a computer with its own RTTY program, I don't have a simple solution - can anyone out there help? If so please drop me a line to the address at the head of the column.

## AMVER?

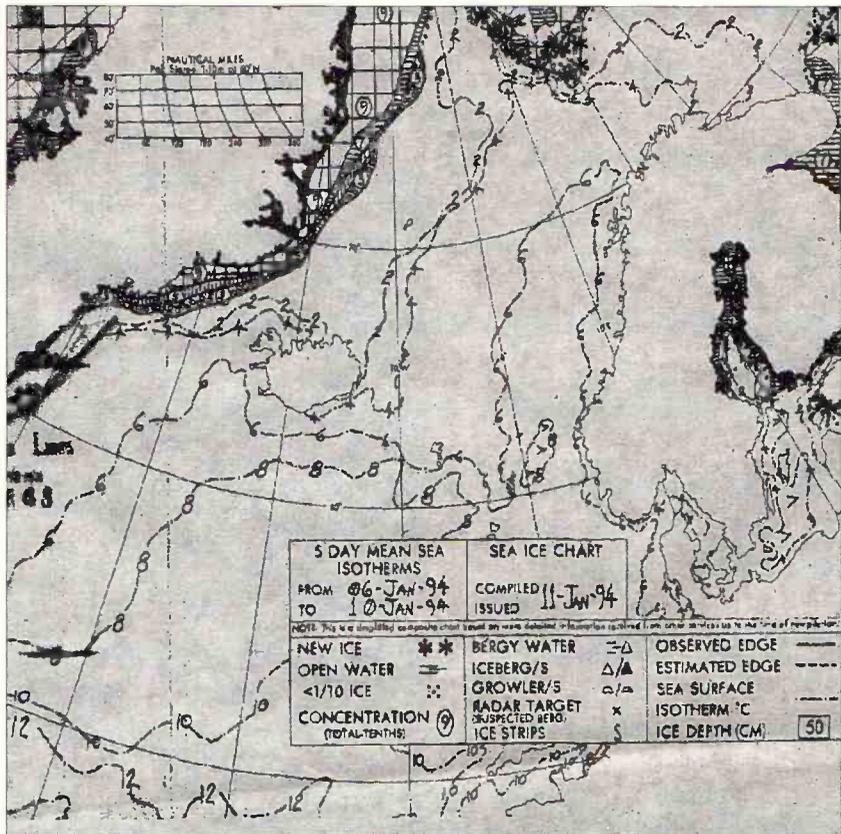
Last month Mr M Cox of Wigan wrote asking for an explanation of the word AMVER that's often to found when monitoring American c.w. stations. Having made the appeal through the column, several of readers have written with the answer. One from a regular contributor is a comprehensive answer.

AMVER is in fact an acronym for Automated Mutual assistance Vessel Rescue system. The system is operated by the US Coastguard and is designed to help co-ordinate search and rescue operations. Vessels involved in the scheme send details of their movement plans to the US Coastguard in New York via co-operating coast stations. The stations involved in the scheme can be recognised by the phrase "OBS AMVER?" included in their ID tapes.

You may also catch the ship transmission giving an AMVER report. These can be recognised as the message is preceded by AMVER/PR//. The messages generally use the following basic structure:

- A/ Vessel name and callsign
- B/ Date and time (UTC)
- C/ Lat and Long

**High quality JVFX image from Doug Jeffery.**



- E/ Course (3 figs)
- F/ Average speed (3 figs = knots and tenths, no decimal point)
- It may also give:
- G/ Point of departure
- I/ Point of destination/ETA
- L/ Route information (e.g. rhumb-line from X to Y)
- M/ Coast station being monitored

All the information received from AMVER reports is passed to the USCG computer that keeps dead reckoning positions. Should any vessel meet with a problem, the computer can be used to ensure any search and rescue operation is directed to the right area.

Apparently UK coast stations used to accept AMVER messages free of charge but the government stopped paying the fees last year so now the ships have to pay. The only other European system that you may find on the h.f. bands is the Italian ARES or Automated search and REscue System. Just to illustrate the point here's a sample ARES message received during January from the vessel *Jemima-M* using callsign C6MF6:

231530//FM JEMIMA-M//To  
DIFMAR//BT//ARES/08/01/199  
4//  
A/C6MF6/JEMIMA-  
M//BAHAMAS//B/231530//C/4045N/0  
943W//  
L/  
4311N/0936W//L/4830N/0517W//L/49  
50N/0250W//AR

Messages for this system are addressed to DIFMAR using Italian coastal radio stations.

Moving wider afield, the Japanese have JASREP, India have INSPIRES and Israel use MOT. If you have any sample messages or

have details of the formats used then please drop me a line.

## Utilities - Getting Started

Following my offer to supply readers with free copies of the FAX program JVFX I've received a number of letters from listeners who see the JVFX program as a cheap and easy way to dip a toe in the black art of utilities!

The majority of these letters ask a wide range of basic, but very sensible, questions. The problem is there are no publications that really give a beginners view on how to start up in this game. The situation is further complicated as the range of decoding systems and information being transmitted is constantly changing. It's at this point that I'll try and lend a helping hand with a topical view of the utility scene today.

One of the first issues to tackle is that of the difference between h.f. and v.h.f./u.h.f. as many listeners have interests that span the complete radio spectrum. It's important to realise that there are a number of very distinct differences between h.f. and the higher frequencies and they can almost be considered different mediums, both in terms of the type of transmissions and the reception techniques. As a general rule the v.h.f. and u.h.f. bands are only really suitable for line-of-sight communication links and so give access to primarily local information. The only reliable exception to this is when receiving signals from satellites. In this case the link is still line-of-sight, but the distance to the satellite can be as much as 28000km for geostationary satellites such as those used for TV and the popular Meteostat.

It's also worth noting that the v.h.f. bands can give rise to transmission over much greater distances under favourable weather conditions. A typical example of this is the enhanced propagation that occurs during periods of high pressure in the summer. This is when we find our TV pictures suffering interference from foreign stations. Many listeners look out for these conditions so they can receive transmissions that are not normally accessible. For more details on this you need to keep an eye on Ron Ham's 'Propagation' column.

The h.f. bands on the other hand are used for much longer range communications and can reliably circle the globe.

From the point of view of receiving signals from h.f. and v.h.f., the main difference lies in the type of antenna system used. Because of the short wavelengths of v.h.f. signals it's quite easy to construct very efficient and complex antenna systems. On h.f. the situation is very different as antennas with equivalent efficiency would occupy vast areas of land. You only have to look at the antenna farms associated with commercial transmitting stations to see some examples.

As a result, most people use a very simple h.f. antenna system known as the random wire (or incorrectly the long wire) antenna. This is just as long a length of wire as you can muster run over as much space as you can. Although it works best if kept in a fairly straight line, it's not unusual to find these antennas circling the garden or even the loft. The one golden rule is to keep the antenna well away from sources of interference such as TV antennas or mains wiring. If you're

faced with a long lead-in to get from the antenna to the receiver you might like to consider using the Lowe Magnetic Longwire Balun (£39.95). This compact device provides the necessary coupling to enable your long wire to be fed with coaxial cable and so help reduce the risk of interference.

Moving on to receivers, there are few that successfully cover both h.f. and v.h.f. from a utility point of view. This is due to technical compromises that have to be made to give such a wide coverage. Most of the receivers that do offer this very extensive coverage are really optimised as v.h.f. receivers with h.f. as a bonus. For h.f. reception there are a number of simpler receivers appearing on the market that are particularly suitable for those new to utilities. Typical examples are the excellent Lowe HF-150 and the Yaesu FRG-100, both of which have been reviewed in *SWM*.

The important characteristics are frequency coverage from at least 100kHz right through to 30MHz with minimum tuning steps of 10 to 15Hz. In addition, the receiver must have excellent frequency stability (especially for FAX) and be able to receive u.s.b. One other point to consider is that of computer control. When listening to a wide range of transmissions it can be very useful to be able to use your computer both to control the receiver's operation and store your favourite frequencies. A particularly neat combination can be found when using the HF-150 with the Modemaster decoder. This set-up brings the decoder and receiver into one co-ordinated package to give fully automated FAX reception.

Before I look at the various decoding options, let's just take a look at the type of information you can expect to be able to receive.

**Press:** There are a wide range of radioteletype (RTTY) press services operating throughout the h.f. bands. Most of these originate from the Middle East and eastern Europe with just a few from the Far East. Most of the more developed countries have now converted to satellite based distribution systems. In addition to RTTY services there just a few press FAX transmissions that send news photos. Most of these currently originate from South America.

**Aeronautical:** There are a few stations transmitting flight plans, some of whom use standard RTTY whilst others use more complex TDM or ARQ modes. These advanced modes are only available when using top-of-range decoders.

**Meteorological:** There is a vast range of information available from a limited amount of plain language forecasts to masses of Synoptic coded data. The Synoptic data can be decoded into plain text using systems such as the Synoptic decoder from ERA or Skyview Systems. There are also a very wide range of weather FAX images available from all over the world. These can be received very easily using a number of FAX reception packages.

**Military:** Although there are loads of these transmissions spread throughout the h.f. bands few can be decoded by the amateur. Many of the more modern systems use complex pseudo-random transmission modes that cannot be decoded with any of the amateur decoding systems on the market today. These transmissions do however, cause a lot of confusion with utility listeners as they sound for all the world like normal RTTY. The other snag with military transmissions is that even if you are able to decode the transmission system you may well find that the message itself is encoded!

**Diplomatic:** Many of these transmissions can be found using the more obscure modes. Like their military counterparts, message encryption is used extensively.

**Maritime:** This is perhaps one of the more popular transmission types and there's lots to decode. Transmission modes include c.w., RTTY and ARQ and primarily handle basic ship-to-shore communications.

## Decoders

For decoding these signals you need to decide whether you want a stand alone unit or would prefer to use your own computer. For stand alone decoders, the units from ERA and Momentum Communications represent very good value and provide access to the most of the more popular modes. For more advanced stand alone units, take a look at the Universal range from Martyn Lynch. I recently reviewed most of the range and they proved to be very capable decoders. Another model worth investigating is the Wavecom W4010, though I'm not sure who's handling it now.

If you prefer to use computer based decoding there are a wide range of systems available. By far the most popular computer is the IBM PC or clone and these can be picked-up at very reasonable prices. The PC is very well supported through specialist packages from companies such as Comar, ICS, Lowe and Grosvenor.

To help give you a better idea on how to put together a station, next month I will include details of a variety of readers stations.

## JVFAX -Update

My offer to supply copies of this excellent FAX and SSTV package has proved to be almost overwhelmingly popular - for the first few weeks I've been bashing out copies at the rate of a hundred a week!! Just so that I can keep my sanity, can I ask that you make sure you send formatted disks - I can handle 720K or 1.44Mb. It is also not a good idea to send old or cheap disks as they often fail - I make every effort to ensure you get your own disk back so you won't lose out by sending a good disk.

Some readers have been using the program with slow 8088/86 computers and running into a few problems when trying to receive the

## PIAB Schedule

Werner Merz of Colchester has sent me an interesting schedule for the German press station PIAB Bonn. This station uses the FEC-A transmission mode running at 96 baud, so will only be available to those with the more advanced decoding systems.

| Time UTC  | Frequency (MHz) | Callsign |
|-----------|-----------------|----------|
| 0830-1030 | 16.0138         | DGQ 21L5 |
| 0830-1030 | 20.4985         | DGU 50L2 |
| 0830-1030 | 15.9224         | DGP 92H3 |
| 1200-1400 | 20.5006         | DGU 50H1 |
| 1200-1400 | 23.691          | DGX 69L2 |
| 1445-1545 | 0.1237          | DCF42    |
| 1445-1545 | 11.1235         | DGL 26L2 |
| 1430-1630 | 18.7024         | DGS 70H3 |
| 1430-1630 | 20.0224         | DGU 20H3 |
| 1400-1600 | 13.5709         | DGN 57L1 |
| 1600-1800 | 11.112          | 9VE      |
| 0230-0430 | 18.05           | 9VF255   |
| 0230-0430 | 19.535          | 9VC91    |
| 1600-1800 | 7.9             | 9VF39    |

higher resolution FAX pictures. The solution is to alter the interrupt frequency using the configuration menu. By reducing this parameter you limit the number of dots per line and so reduce the demands on the processor.

Next tip is to make sure you set the Demodulator to '4-7 bits Comparator' using the configuration menu. Many newcomers make the mistake of setting the Demodulator to serial when using the simple interface.

Don't forget, JVFX includes a host of amateur SSTV transmit and receive modes, but more of that later.

## JVFAX Interface

One of the problems facing newcomers to JVFX is getting hold of a suitable interface. If you are able to use a soldering iron and have some basic skills you will find that the simple comparator interface is quite easy to build. However, I know from experience that many listeners don't have any facilities for even simple construction. You will be pleased to know that help is at hand from a High Wycombe based electronics company.

Pervisell Ltd are now taking regular adverts in *SWM* and have sent me a sample of their JVFX interface. This is an uprated version of the JVFX simple interface and features a faster Op-Amp to enable higher definition. Having tried the interface I can confirm that the performance is excellent with a noticeable improvement in resolution.

I also took the interface apart to check the build quality. I have to admit I was very impressed as the unit uses modern surface mount technology based around a high quality glass-fibre p.c.b. that mounts directly onto the 25-way D connector. This connector and the 3.5mm jack were of very good quality and the connecting cable was securely attached to the plugs. Perhaps the most amazing feature is the price - just £16.99 inclusive of VAT and postage! The only reason they can achieve such competitive

prices is by combining the interface production with their main commercial operation, which is the manufacture of single chip microcontroller products for a major international companies.

An added benefit is that the JVFX interface passes through the same quality check processes as their main core products. In fact the performance and quality is so good it's almost not worth building your own! The latest news is that they also have plans for a sophisticated interface that will give access to high resolution grey scale images. For more details contact Pervisell Ltd, 8 Temple End, High Wycombe, Bucks HP13 5DR. Tel: (0494) 443033. My thanks to Phil Perkins for the supply of the review sample.

## Special Offers

I can offer a number of services that are designed to make life easier for the utility listener.

Perhaps one of the most popular is JVFX v6.0. This software package for IBM PCs and compatibles gives access to the world of FAX and SSTV for very little outlay. For your copy just send me a blank, formatted 3.5" disk (720K or 1.44Mb), sticky return address label and three first class stamps. You don't need to send return mailers as disks are sent out in a suitable padded envelope. If you just request a copy of the program then the turn-round time is usually only a day or two, but if you ask questions in the letter please be prepared to wait about three or four days because I can't always answer the queries instantly.

Next in line comes the *Day Watson Beginners Frequency List* that has just been updated to version 1.94. I can also offer the latest Decode list of stations reported by regular readers. For either of these list just send three first or second class stamps and a sticky return address label to the address at the head of the column.

Of course, your logs and pictures are always welcome, they're what keeps the column going.

# Long Medium & Short

By Brian Oddy G3FEX,  
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## Medium Wave Chart

| Freq (kHz) | Station               | Country     | Power (kW)    | Listener                     |
|------------|-----------------------|-------------|---------------|------------------------------|
| 520        | Hof-Saale (BR)        | Germany     | 0.2           | A.E.*G*                      |
| 520        | Hof/Würzburg (BR)     | Germany     | 0.2           | L*                           |
| 531        | Alin Beida            | 1600        | A.E.*G*,I*,L* |                              |
| 531        | Akraberg              | Faroe Is    | 600           | G*,J                         |
| 531        | Leipzig               | Germany     | 100           | A.E.*G*,L*,M*,D*,Q*          |
| 531        | RNE1 via ?            | Spain       | 7             | D*,G*,L*,M*,D*,Q*            |
| 531        | Beromünster           | Switzerland | 500           | A.G*,L*,N                    |
| 540        | Wavre                 | Belgium     | 150/50        | A.E.*G*,J*,L*,M*,N,O,P*,Q*   |
| 540        | Solt                  | Hungary     | 2000          | E*,G*,J*,L*,M*,Q*            |
| 540        | Conamara              | Eire        | 2             | E*,L*,N                      |
| 540        | Sidi Bennour          | Morocco     | 600           | G*,L*,O*                     |
| 540        | Vitoria(EI)           | Spain       | 10            | G*,L*                        |
| 549        | Les Trembles          | Algeria     | 600           | G*,J*,L*,O*,Q*               |
| 549        | Thurnau (DLF)         | Germany     | 200           | A.D*,E*,G*,L*,M*,O,P*        |
| 549        | St Petersburg         | Russia      | 1000          | G*                           |
| 550        | Espoo                 | Finland     | 100           | L*                           |
| 558        | Rostock(NDR)          | Germany     | 20            | M*                           |
| 558        | Tirgu Jiu             | Romania     | 200           | G*                           |
| 558        | RNE1 via ?            | Spain       | 7             | G*,L*,M*,O*,P*,Q*            |
| 558        | Cima di Dentro        | Switzerland | 300           | L*                           |
| 567        | Berlin                | Germany     | 100           | L*,M*                        |
| 567        | Tullamore(RTE1)       | Eire        | 500           | A.D*,E*,J,L*,N,O,P*,Q*,S     |
| 567        | Laayoune              | Morocco     | 50            | G*                           |
| 567        | RNE1 via ?            | Spain       | 7             | L*,O*                        |
| 576        | Bechare               | Algeria     | 400           | E*                           |
| 576        | Vidin                 | Bulgaria    | 100           | G*                           |
| 576        | Mühlacker(SDR)        | Germany     | 500           | A.E.*L*,M*,O*                |
| 576        | Schwerin(NDR)         | Germany     | 250           | O*                           |
| 576        | Riga                  | Latvia      | 600           | O*                           |
| 576        | Braga                 | Portugal    | 10            | L*                           |
| 576        | Barcelona(RNE1)       | Spain       | 50            | E*,G*,L*,M*,P*,Q*            |
| 585        | Orl Wien              | Austria     | 600           | O*,S                         |
| 585        | Paris(FIP)            | France      | 8             | G*,J,M*                      |
| 585        | Madrid(RNE1)          | Spain       | 200           | D*,E*,G*,L*,M*,O*,P*,Q*      |
| 585        | Dumfries(BBC Scot)    | UK          | 2             | N                            |
| 594        | Frankfurt(HR)         | Germany     | 1000/400      | A.D*,E*,L*,M*,O*,P*,Q*       |
| 594        | Vidra                 | Morocco     | 100           | A.G*,L*,O*                   |
| 594        | Muge                  | Portugal    | 100           | G*,L*,M*,O*                  |
| 603        | Lyon                  | France      | 300           | M*,N,O*,S                    |
| 603        | Sevilla(RNE1)         | Spain       | 50            | E*,G*,L*,M*,O*               |
| 603        | Newcastle(BBC4)       | UK          | 2             | E*,M*                        |
| 612        | Athlone(RTE2)         | Eire        | 100           | A.C*,D*,E*,J,L,I,N,O,P*,Q*,S |
| 612        | Sabaa-Aioune          | Morocco     | 300           | G*,M*                        |
| 612        | RNE1 via ?            | Spain       | 10            | G*,O*                        |
| 621        | Wavre                 | Belgium     | 80            | A.E*,L*,N*,O*,P*,Q*          |
| 621        | Batrah                | Egypt       | 2000          | G*,L*                        |
| 621        | RNE1 via ?            | Spain       | 10            | G*,L*,O*                     |
| 621        | Barcelona(OCR)        | Germany     | 50            | E*,G*,M*,O*                  |
| 630        | Dammenberg(NDR)       | Germany     | 100           | E*                           |
| 630        | Vidra                 | Norway      | 100           | D*,L*,M*,N,O*,P*,Q*          |
| 639        | Praha(Liblice)        | Czech       | 1500          | G*,L*,M*,O*,P*,Q*            |
| 639        | RNE1 via ?            | Spain       | 7             | A.D*,E*,G*,L*,M*,N,O,P*,Q*   |
| 648        | RNE1 via ?            | Spain       | 10            | G*,L*,M*                     |
| 648        | Orfordness(BBC)       | UK          | 500           | E*,J,M*,N,O,P                |
| 657        | Neubrandenbg(NDR)     | Germany     | 250           | E*,L*,M*,O*                  |
| 657        | Napoli                | Italy       | 120           | G*                           |
| 657        | Madrid(RNE1)          | Spain       | 20            | G*,L*,M*,N*,O*               |
| 657        | Wrexham(SBC Wales)    | UK          | 2             | I,N,P*,Q*                    |
| 666        | Bodenseesender(SWR)   | Germany     | 300/180       | D*,E*,G*,M*,N*,O*,P*,Q*,S    |
| 666        | R Vilnius             | Lithuania   | 50            | G*,M*                        |
| 666        | Lisboa                | Portugal    | 135           | G*,L*,O*,Q*                  |
| 666        | Barcelona(COPE)       | Spain       | 10            | D*,E*,G*,L*                  |
| 675        | Marseille             | France      | 600           | A.E.*G*,L*,M*,N*,O*,P*,Q*    |
| 684        | Sevilla(RNE1)         | Spain       | 500           | D*,E*,G*,L*,M*,N*,O*,P*,Q*   |
| 684        | Beograd               | Yugoslavia  | 2000          | A.E.*G*,L*,M*,N*,O*,P*,Q*,T* |
| 693        | Berlin                | Germany     | 250           | L*                           |
| 693        | Tortosa(RNE1)         | Spain       | 2             | M*                           |
| 693        | Droitwich (BBC5)      | UK          | 150           | D,E,O*,P*,Q*,S               |
| 702        | Flemsberg (NDR)       | Germany     | 5             | A.E.*M*                      |
| 702        | Monte Carlo           | Monaco      | 300           | C*,G*,M*                     |
| 702        | Prasop                | Slovak Rep  | 400           | G*,L*,O*,Q*                  |
| 702        | Zamorá(RNE1)          | Spain       | 10            | D*,E*,G*,L*,M*,O*,P*,Q*      |
| 711        | Rennes 1              | France      | 300           | A.G,H,L*,M*,N,O,Q*           |
| 711        | Heidelberg            | Germany     | 5             | L*,M*                        |
| 711        | Laayoune              | Morocco     | 600           | G*,L*,O*,Q*                  |
| 711        | Murcia(COPE)          | Spain       | 5             | D*,G*                        |
| 720        | Langenberg            | Germany     | 200           | M*,O                         |
| 720        | Lisnagarvey(BBC4)     | N Ireland   | 10            | D,N*                         |
| 720        | Norte                 | Portugal    | 100           | G*,L*,M*,O*                  |
| 720        | Stax                  | Tunisia     | 200           | O*                           |
| 720        | Lots Rd, London(BBC4) | UK          | 0.5           | C,E,O*,S                     |
| 729        | Cork(RTE1)            | Eire        | 10            | C*,E*,L*,M*,N,O*,P*,Q*,S     |
| 729        | RNE1 via ?            | Spain       | 7             | D*,G*,L*,M*,O*,P*,Q*         |
| 738        | Poznan                | Poland      | 300           | G*,O*,Q*                     |
| 738        | Barcelona(RNE1)       | Spain       | 500           | D*,E*,G*,L*,M*,O*,P*,Q*      |
| 747        | Flevo(Hilv2)          | Netherlands | 400           | A.E.*H*,L*,M*,N,O,P*,Q*,S    |
| 747        | Cádiz(RNE1)           | Spain       | 10            | G*,L*,M*,O*                  |
| 756        | Braunschweig(OLF)     | Germany     | 800/200       | D*,E*,L*,M*,N,O,P*,S         |
| 756        | Bilbao(EI)            | Spain       | 5             | E*,H*,L*,M*,O*               |
| 756        | Redruth(BBC4)         | UK          | 2             | M*                           |
| 765        | Dakar                 | Senegal     | 400           | R*                           |
| 765        | Sottens               | Switzerland | 500           | D*,E*,G*,L*,M*,N,O*,P*,Q*    |
| 774        | Enniskillen(BBC4)     | N Ireland   | 1             | M*,N,S                       |
| 774        | Agadir                | Morocco     | 50            | G*                           |
| 774        | RNE1 via ?            | Spain       | 7             | D*,E*,G*,L*,M*,O*,P*,Q*      |
| 783        | Burg                  | Germany     | 1000          | A.E*,G*,L*,M*,N,O,P*,Q*      |
| 783        | Miramar(R Porto)      | Portugal    | 100           | E*,G*,L*,M*,O*               |
| 783        | Tarbus                | Syria       | 600           | G*,L*                        |
| 792        | Limoges               | France      | 300           | M*,O                         |
| 792        | Lingen(NDR)           | Germany     | 5             | L*,M*                        |
| 792        | Sevilla(SER)          | Spain       | 20            | D*,E*,G*,L*,M*,O*,P*,Q*      |
| 792        | Londonderry(BBC)      | UK          | 1             | N                            |
| 801        | München-Ismaning      | Germany     | 300           | E*,L*,M*,O*,Q*               |
| 801        | St Petersburg         | Russia      | 1000          | Q*                           |

| Freq (kHz) | Station             | Country     | Power (kW) | Listener                  |
|------------|---------------------|-------------|------------|---------------------------|
| 801        | RNE1 via ?          | Spain       | 7          | E*,G*,L*,M*,O*,P*,Q*      |
| 810        | Madrid(SER)         | Spain       | 20         | G*,L*,M*,O*               |
| 810        | Westerglen(BBC)     | UK          | 100        | E*,M,N,O,P*,Q*,S          |
| 819        | Batrah              | Egypt       | 450        | E*,G*,L*                  |
| 819        | Toulouse            | France      | 50         | L*,M*,N,O*,Q*             |
| 819        | Trieste             | Italy       | 25         | G*                        |
| 819        | Warsaw              | Poland      | 300        | L*,M*,O*                  |
| 819        | San Sebastián(EI)   | Spain       | 5          | E*,G*,L*,M*,O*            |
| 828        | Hannover(NDR)       | Germany     | 100/5      | L*,M*,O*                  |
| 828        | Corca Duhthine      | Eire        | 1          | N                         |
| 828        | Barcelona(SER)      | Spain       | 50         | E*,L*,N,O*                |
| 837        | Nancy               | France      | 200        | L*,O*,Q*,S*               |
| 837        | COPE via ?          | Spain       | 7          | G*,L*,M*,O*,P*,Q*         |
| 837        | Kharkiv             | Ukraine     | 150        | G*                        |
| 846        | Ostrava             | Czech Rep   | 30         | G*                        |
| 855        | Berlin              | Germany     | 100        | A.G*,L*,O*,Q*             |
| 855        | RNE1 via ?          | Spain       | 125        | D*,G*,L*,M*,O*,P*,Q*      |
| 864        | Santah              | Egypt       | 500        | G*,O*                     |
| 864        | Paris               | France      | 300        | A,L*,M*,N,O               |
| 864        | Socuellamos(RNE1)   | Spain       | 2          | G*,L*,O*,Q*               |
| 873        | Frankfurt(DFN)      | Germany     | 150        | D*,G*,L*,M*,N*,O*,P*,Q*   |
| 873        | Zaragoza(SER)       | Spain       | 20         | G*,M*,O*                  |
| 882        | COPE via ?          | Spain       | 7          | G*,L*,M*,O*               |
| 882        | Washford(BBC)       | UK          | 100        | I,M,N,O,Q*,S              |
| 891        | Algier              | Algeria     | 600/300    | G*,L*,M*,N*,O*,P*,Q*      |
| 891        | Hulsberg            | Netherlands | 20         | L*,M*,O*,T*               |
| 891        | Vilamoura           | Portugal    | 10         | L*                        |
| 900        | Milan               | Italy       | 600        | B*,G*,L*,M*,O*            |
| 900        | COPE via ?          | Spain       | 7          | L*,M*,O*,Q*               |
| 909        | Malorca(RNE1)       | Spain       | 10         | G*,L*                     |
| 909        | Lisnagarvey(BBC2)   | N Ireland   | 10         | N                         |
| 909        | Brookmans PK(BBC2)  | UK          | 140        | O*,S                      |
| 909        | Moorside Ed.(BBC2)  | UK          | 200        | O                         |
| 918        | R Ljubljana         | Slovenia    | 600/100    | G*,L*,M*,O*,Q*            |
| 918        | Madrid(R Int)       | Spain       | 20         | L*,M*,N,O*,Q*             |
| 927        | Timimoun            | Algeria     | 5          | L*                        |
| 927        | Wolvertem           | Belgium     | 300        | L*,M*,N,O,P*,Q*,S         |
| 927        | Evora(RRE)          | Portugal    | 1          | L*                        |
| 927        | Izmir               | Turkey      | 200        | L*                        |
| 936        | Bremen              | Germany     | 100        | G*,L*,M*,N,O*             |
| 936        | Vanezia             | Italy       | 20         | O*                        |
| 936        | Agadir              | Morocco     | 500        | L*                        |
| 936        | RNE1 via ?          | Spain       | 7          | G*,L*,M*,O*               |
| 945        | Toulouse            | France      | 300        | L*,M*,O*,Q*,S             |
| 954        | Brno(Dobrochov)     | Czech Rep   | 200        | M*,O*,Q*                  |
| 954        | Madrid(CI)          | Spain       | 20         | D*,G*,L*,M*,O*,Q*,S       |
| 954        | Trabzon             | Turkey      | 300        | L*                        |
| 963        | Pori                | Finland     | 600        | G*,L*,M*,O*,Q*            |
| 963        | Paris               | France      | 8          | M*                        |
| 963        | Tir Chonaill        | Eire        | 10         | L*,N,O*                   |
| 963        | Seixal              | Portugal    | 10         | L*                        |
| 972        | Hamburg(NDR)        | Germany     | 300        | A,D*,L*,M*,N*,O*          |
| 972        | RNE1 via ?          | Spain       | 7          | M*,O*                     |
| 972        | Mikolajev           | Ukraine     | 500        | G*,L*                     |
| 981        | Algier              | Algeria     | 600/300    | D*,E*,G*,L*,M*,P*,Q*      |
| 981        | Megara              | Greece      | 200        | A*,M*                     |
| 981        | Coimbra             | Portugal    | 10         | G*                        |
| 990        | Berlin              | Germany     | 300        | G,M*                      |
| 990        | Potenza             | Italy       | 10         | G*                        |
| 990        | Bilbao(SER)         | Spain       | 10         | D*,E*,G*,L*,M*,O*         |
| 990        | Redmoss(BBC Scot)   | UK          | 1          | M*                        |
| 990        | Tywyn(BBC2)         | UK          | 1          | N                         |
| 999        | Schwerin (RIAS)     | Germany     | 20         | G*,M*                     |
| 999        | Torino              | Italy       | 20         | G*,L*,O*                  |
| 999        | Madrid(COPE)        | Spain       | 50         | G*,L*,M*                  |
| 1008       | Las Palmas(SER)     | Spain       | 400        | G*,L*,M*                  |
| 1008       | Flevo(Hilv5)        | Netherlands | 400        | A,L*,M*,O*,P*,Q*          |
| 1017       | Rheinsender(SWF)    | Germany     | 600        | D*,E*,J,L*,M*,N,O,P*,Q*,S |
| 1017       | RNE1 via ?          | Spain       | 7          | G*,L*,M*                  |
| 1026       | Graz-Obb            | Austria     | 100        | M*,O*                     |
| 1026       | SER via ?           | Spain       | 7          | G*,L*,O*                  |
| 1035       | Tallinn             | Estonia     | 500        | Q*                        |
| 1035       | Milan               | Italy       | 50         | G*                        |
| 1035       | Lisbon(Prog3)       | Portugal    | 120        | D*,E*,L*,M*,O*,Q*         |
| 1044       | Dresden             | Germany     | 250        | M*,O*,P*                  |
| 1044       | Sabaa-Aioune        | Morocco     | 300        | G*,L*                     |
| 1044       | San Sebastián(SER)  | Spain       | 10         | D*,G*,L*,M*,O*            |
| 1053       | Zaragoza(COPE)      | Spain       | 10         | G*,L*,M*                  |
| 1053       | Droitwich(BBC1)     | UK          | 150        | D,O,P,S                   |
| 1062       | Kalundborg          | Denmark     | 250        | D*,L*,M*,N,O*,Q*          |
| 1062       | Norte               | Portugal    | 100        | G*,O*                     |
| 1071       | Prague              | Czech Rep   | 50         | G*                        |
| 1071       | Brest               | France      | 20         | D*,O                      |
| 1071       | Lille               | France      | 40         | A,M*                      |
| 1071       | Bilbao(EI)          | Spain       | 5          | L*,M*,O*,Q*               |
| 1080       | Katowice            | Poland      | 1500       | M*,O*,Q*                  |
| 1080       | Toledo(OCR)         | Spain       | 5          | G*,L*                     |
| 1080       | SER via ?           | Spain       | 7          | D*,G*,L*,M*,O*,Q*         |
| 1089       | Krasnodar           | Russia      | 300        | L*                        |
| 1089       | Brookmans PK(BBC1)  | UK          | 150        | O,S                       |
| 1089       | Lisnagarvey(BBC1)   | UK          | 10         | N                         |
| 1089       | Moorside Edge(BBC1) | UK          | 150        | O                         |
| 1089       | Nitra(Jarok)        | Slovak Rep. | 1500       | M*,O*,Q*                  |
| 1089       | RNE1 via ?          | Spain       | 7          | G*,L*,O*,M*,Q*            |
| 1107       | Munich(DFN)         | Germany     | 40         | D*,G*,L*,M*,P*,Q*         |
| 1107       | RNE1 via ?          | Spain       | 7          | G*,L*,M*,O*,Q*            |
| 1107       | Wallasey(BBC1)      | UK          | 0.5        | D,N                       |
| 1116       | Bar                 | Italy       | 150        | G*,M*,O*                  |
| 1116       | Pontevedra(SER)     | Spain       | 5          | G*,L*,M*,O*               |
| 1125       | La Louvière         | Belgium     | 20         | D*,M*,O*                  |
| 1125       | RNE1 via ?          | Spain       | 7          | G*,L*,O*                  |
| 1125       | Llandrindod Wells   | UK          | 1          | N                         |
| 1134       | Zadar               | Croatia     | 600/1200   | G*,M*,O*,P*,Q*            |
| 1134       | COPE via ?          | Spain       | 2          | G*,L*,M*,O*,P*,Q*         |
| 1143       | AFN via ?           | Germany     | 1          | L*                        |
| 1143       | Stuttgart(DFN)      | Germany     | 10         | M*                        |
| 1143       | Messina             | Italy       | 6          | M*,O*                     |
| 1143       | COPE via ?          | Spain       | 2          | G*,L*,O*                  |
| 1152       | RNE1 via ?          | Spain       | 10         | L*,M*,O*                  |
| 1161       | Strasbourg(F Int)   | France      | 200        | L*,M*,N,O*                |
| 1161       | San Sebastián(EI)   | Spain       | 50         | G*,L*,O*                  |
| 1170       | Vile Real           | Portugal    | 10         | L*,M*,O*                  |
| 1170       | Beli Kriz           | Slovenia    | 300        | L*                        |
| 1179       | Thessaloniki        | Greece      | 50         | A*,L*                     |
| 1179       | SER via ?           | Spain       | 7          | L*,M*,O*                  |
| 1179       | Sölvesborg          | Sweden      | 600        | A,O*,H*,L*,M*,N,O,P*,Q*,S |
| 1188       | Kuurne              | Belgium     | 5          | A,G*,L*,M*,O*,Q*          |

| Freq (kHz) | Station            | Country     | Power (kW) | Listener               |
|------------|--------------------|-------------|------------|------------------------|
| 1188       | Reichenbach(MDR)   | Germany     | 5          | G,L*                   |
| 1188       | Szolnok            | Hungary     | 135        | M*                     |
| 1197       | Munich(VOA)        | Germany     | 300        | B,G*,M*,N,O*           |
| 1197       | Virgin via ?       | UK          | 100        | H*,M*,N,O              |
| 1206       | Bordeaux           | France      | 100        | L*,M*,O*,S             |
| 1206       | Warsaw             | Poland      | 200        | L*,O*                  |
| 1215       | COPE via ?         | Spain       | 7          | L*,M*                  |
| 1215       | Virgin via ?       | UK          | 7          | D,F*,K,M,N,O,P,S       |
| 1224       | Vidin              | Bulgaria    | 500        | M*,O*                  |
| 1224       | COPE via ?         | Spain       | 7          | G*,L*                  |
| 1233       | Lège               | Belgium     | 5          | M*,O                   |
| 1242       | Marseille          | France      | 150        | G*,L*,M*               |
| 1242       | Virgin via ?       | UK          | 7          | S                      |
| 1251       | Marcali            | Hungary     | 500        | G*,M*,O*,P*,Q*         |
| 1251       | Tripoli            | Libya       | 500        | L*                     |
| 1251       | Hulsberg           | Netherlands | 10         | L*,M*,O*,Q*            |
| 1260       | SER via ?          | Spain       | 7          | G*,L*,M*,O*            |
| 1269       | COPE via ?         | Spain       | 7          | G*,L*,O*               |
| 1278       | Strasbourg         | France      | 300        | G*,M*,O*,Q*            |
| 1278       | Dublin(Cork(RTE2)) | Eire        | 10         | C*,D*,L*,N,O*,P*,Q*    |
| 1287       | RFE via ?          | Czech Rep.  | 400        | A,G*,L*,M*,O           |
| 1287       | Lérida(SER)        | Spain       | 10         | G*,L*,M*,O*            |
| 1296       | Valencia(COPE)     | Spain       | 10         | D*,G*,L*,M*,O*,Q*,S    |
| 1296       | Rebia              | Sudan       | 1500       | S                      |
| 1296       | Orfordness(BBC)    | UK          | 500        | M*,O                   |
| 1305       | Marche             | Belgium     | 10/5       | M*                     |
| 1305       | Rzeszów            | Poland      | 100        | G*,M*,O*               |
| 1305       | RNE1 via ?         | Spain       | 7          | A,B*,L*,M*,N,O,P*,Q*,S |
| 1314       | Koltsay            | Norway      | 1200       | G*,M*,O*               |
| 1314       | Valladolid(RNE1)   | Spain       | 10         | G*,M*,O*               |
| 1323       | Leipzig(RMWS)      | Germany     | 150        | D*,G*,M*,N,O*,T*       |
| 1323       | Wachenbrunn        | Germany     | 1000/150   | L*                     |
| 1332       | Rome               | Italy       | 300        | G*,L*,M*,O*,Q*,T*      |
| 1341       | Lakihegy           | Hungary     | 300        | M*                     |
| 1341       | Lisnagarvey(BBC)   | N Ireland   | 100        | J*,N,O,P*,Q*,S         |
| 1341       | Tarrasa(SER)       | Spain       | 2          | G*                     |
| 1350       | Nancy/Nice         | France      | 100        | D*,L*,M*,N,O*,Q*,S     |
| 1350       | Cesvaine/Kuldiga   | Latvia      | 50         | G*                     |
| 1359       | Mellila            | Morocco     | 5          | L*,O*                  |
| 1359       | Arganda (RNE-FS)   | Spain       | 600        | O*                     |
| 1368       | Foxdale(ManXR      |             |            |                        |

Although the time system used in the UK changes from Greenwich Mean Time (GMT) to British Summer Time (BST) on March 27, listeners should not alter the clock by their receiver.

International broadcasters refer to the times of their transmissions in Universal Co-ordinated Time (UTC), which for most practical purposes is the same as GMT. All times quoted in LM&S are in UTC, so when sending in a contribution please be sure to state the times in UTC and not BST.

## Long Wave Reports

The broadcasts from nine l.w. stations in Europe and N Africa reached Canada at night over the Christmas period! On December 29 **Alan Roberts** (Quebec) heard the BBC shipping forecast on 198kHz. The combined signal from Droitwich (500kW), Burghead (50kW) and Westerglen (50kW) was SIO222 at 0030UTC. He says, "After 30 years of N American life it was nice to hear the likes of Dogger, Fastnet, Irish Sea, Rockall, etc., again". The other transatlantic signals that he heard are in the chart, most were heard just after midnight and rated SIO222, but the signal from Allouis, France on 162kHz peaked SIO333 at 0458.

## Medium Wave Reports

Although an impressive list of m.w. transatlantic signals was compiled in December by **Paul Logan** in Lisnaskea, Co Fermanagh, he found conditions less favourable than in November. The best night proved to be December 27, when the signal from CJYQ in St. John's, on 930kHz peaked a remarkable SIO555.

In contrast, CJYQ was only SINPO 13321 at 0330 by **Ron Damp** in Worthing on December 19. The report from **Ted Barty** in N London also indicated poor reception of their signals that night, whereas the previous night it was 34444 at 0350. Frequent checks by **Roy Patrick** in Derby revealed that CJYQ could often be heard around 2350, a useful tip for anyone about to try this aspect of our hobby.

**Ron Galliers** (Islington) listened to a New Year party on 930kHz and suspected it was from CJYQ, but it proved to be CFBC in St. John's, NB! By 0108 the signal was 33223 and peaked 43323 later. CFBC was also heard for the first time by **Darran Taplin** in Brenchley. It was just audible at 2250 but an ident could not be obtained until 0345. By that time it rated 33333. He says, "One thing I cannot understand is why I did not hear CJYQ on that frequency".

Good signals from WBBR in New York on 1130 were noted by several listeners. **Gerry Haynes** (Bushey Heath) logged them as 34422 at 0130. Surprising as it may seem, **John Parry** (Northwich) found they were still audible one morning at 0815!

Several listeners in the UK picked up the sky wave signals from stations in N Africa and the Middle East after dark, see chart.

BBC R Sussex and BBC R Surrey have formed a new station called BBC R Sussex and Surrey. It is based in Guildford so that new studios there can be used to advantage. The Brighton premises are to house a bi-media news bureau. Offices in other Sussex towns will be opened later.

## Short Wave Reports

The 25MHz (11m) band is still used by four broadcasters to reach Africa. There were no reports to indicate how well they are received there, but a few listeners in the UK logged them via back scatter and other modes. R Norway Int, Oslo 25.730 (Norw 1300-1329) was 25412 at 1328 by **Eddie McKeown** in Newry; R Denmark via RNI 25.730 (Da 1330-1355) 25432 by **Fred Pallant** in Storrington; RFI via Allouis 25.820 (Fr 0900-1555) 35543 at 1206 by **David Edwardson** in Wallsend; R Nederland via Flevo 25.970 (Du 1030-1125, Sun only)

## Local Radio Chart

| Freq (kHz) | Station              | ILW (kW) | a.m.r.p | Listener             |
|------------|----------------------|----------|---------|----------------------|
| 558        | Spectrum R           | I        | 7.50    | B.F.I.*N.O.P.R       |
| 585        | R Solway             | B        | 2.00    | F.L.M.O.P            |
| 603        | Chatham(CO603)       | I        | 7.00    | F.N.O.P.R            |
| 603        | Invicta SG (Coast)   | I        | 0.10    | B.F.I.*R             |
| 630        | R Bedfordshire(3CR)  | B        | 0.20    | B.O.*F.H.N.O.P       |
| 630        | R Cornwall           | B        | 2.00    | N                    |
| 657        | R Chyod              | B        | 2.00    | B.F.O.P.R            |
| 657        | R Cornwall           | B        | 0.50    | N                    |
| 666        | OveonAir R           | I        | 0.34    | F.N.R                |
| 666        | R York               | B        | 0.80    | B.F.P                |
| 729        | BBC Essex            | B        | 0.20    | B.F.N.O.P.R          |
| 738        | Hereford/Worcester   | B        | 0.037   | F.O.P.R              |
| 756        | R Cumbria            | B        | 1.00    | F.L.M                |
| 756        | R Midwynn            | I        | 0.63    | F.O.P.R              |
| 765        | BBC Essex            | B        | 0.50    | B.O.*F.N.O.P.R       |
| 774        | R Kent               | B        | 0.70    | B.F.N.R              |
| 774        | R Leeds              | B        | 0.50    | F                    |
| 774        | Gloucester (3CSG)    | I        | 0.14    | N.O.P                |
| 792        | Chiltern (S. Gold)   | I        | 0.27    | B.F.I.*N.O.P.R       |
| 792        | R Foyle              | B        | 1.00    | M.Q.*                |
| 801        | R Devon              | B        | 2.00    | B.D.*F.*G.H.M.N.P.R  |
| 828        | Chiltern (S. Gold)   | I        | 0.20    | B.F.I.*R             |
| 828        | R WM                 | B        | 0.20    | O.P                  |
| 828        | 2CR (Cl. Gold)       | I        | 0.27    | F.N.R                |
| 837        | R Cumbria/Furness    | B        | 1.50    | F.M                  |
| 837        | R Leicester          | B        | 0.45    | B.F.N.O.P.R          |
| 855        | R Devon              | B        | 1.00    | F.N                  |
| 855        | R Lancashire         | B        | 1.50    | C.L.M                |
| 855        | R Norfolk            | B        | 1.50    | B.F.R                |
| 855        | Sunshine R           | I        | 0.15    | F.M.O.P.R            |
| 873        | R Norfolk            | B        | 0.30    | B.F.I.*R             |
| 936        | Brunel R (Cl. Gold)  | I        | 0.18    | F.N.P.O.R            |
| 945        | R Trent (Gem AM)     | I        | 0.20    | B.C.F.*L.*M.*O.P     |
| 954        | DevonAir (Cl. Gold)  | I        | 0.32    | F.N.R                |
| 954        | R Wyvern (WYVN)      | I        | 0.16    | A.F.M.*O.P.R         |
| 990        | WABC (Nice & Easy)   | I        | 0.09    | B.F.*O.P             |
| 990        | R Aberdeen           | B        | 1.00    | F.L.Q                |
| 990        | R Davon              | B        | 1.00    | F.N                  |
| 990        | Hallam R (Gt. Yorks) | I        | 0.25    | B                    |
| 999        | R Solent             | B        | 1.00    | B.F.N.R              |
| 999        | R Trent (Gem AM)     | I        | 0.25    | B.F.P.R              |
| 999        | Red Rose (Gold)      | I        | 0.80    | L.M.P                |
| 1017       | Beacon R (WABC)      | I        | 0.70    | C.F.I.*K.M.O.R       |
| 1026       | Downton R            | I        | 1.70    | K.M.Q                |
| 1026       | R Cambridgeshire     | B        | 0.50    | B.F.I.R              |
| 1026       | R Jersey             | B        | 1.00    | F.I.N.R              |
| 1035       | NorthSound R         | I        | 0.78    | F.K.*                |
| 1035       | R Kent               | B        | 0.50    | B.F.N.R              |
| 1035       | R Sheffield          | B        | 1.00    | F                    |
| 1035       | West. Sound R        | I        | 0.32    | K.L.M                |
| 1107       | Moray Firth R        | I        | 1.50    | B.F.*K.L.*M*         |
| 1116       | R Derby              | B        | 1.20    | B.C.F.*K.*L.*M.O.P.R |
| 1116       | R Guernsey           | B        | 0.50    | B.F.N.R              |
| 1152       | BRMB (Xtra-AM)       | I        | 3.00    | G.*O.P               |
| 1152       | LBC (L. Talkback R)  | I        | 23.50   | B.F.I.*N.P.R         |
| 1152       | Piccadilly R(Gold)   | I        | 1.50    | C.P                  |
| 1152       | R Broadland          | I        | 0.83    | B.L.*R               |
| 1152       | R Clyde (Clyde 2)    | I        | 3.06    | K.M                  |
| 1161       | Brunel R (Cl. Gold)  | I        | 0.16    | F.P                  |
| 1161       | R Bedfordshire(3CR)  | B        | 0.10    | B.F                  |
| 1161       | R Sussex & Surrey    | B        | 1.00    | B.F.N                |

SIO253 at 1050 by **Kenneth Buck** in Edinburgh. From time to time the broadcasts from RNI and RFI have been heard by Alan Roberts in Quebec, but R Nederland has not been heard because much of the N Atlantic path is still in darkness at 1030UTC.

More favourable conditions have prevailed in the 21MHz (13m) band and signals from several continents have reached here in the day. R Australia's broadcasts to S Asia were heard on three frequencies: 21.525 (Eng 0100-0900) logged as 34333 at 0737 in Bushey Heath & 21.725 (Eng 0900-1100) 44434 at 1000 by **Simon Hockenull** in Bristol both from Darwin and 21.595 from Carnarvon (Eng 0100-0900) SIO233 at 0850 in Edinburgh.

Also heard here in the morning were R Japan via Moyabi 21.575 (Eng to Eu, M East 0700-0900) 35222 at 0722 in Newry; R Pakistan, Islamabad 21.520 (Eng to Eu 0800-0845) 54344 at 0805 by **Chris Shorten** in Norwich; BSKSA Riyadh 21.490 (Ar to SE Asia 0900-1200) 45444 at 0950 by **Darren Beasley** in Bridgwater; R Pakistan, Islamabad 21.520 (Eng to Eu 1100-1120) 43333 at 1100 by **Sheila Hughes** in Morden; UAE R, Abu Dhabi 21.735 (Ar to ? 0800-1155) SIO333 at 1105 by **Bill Clark** in Rotherham; R Moscow Int 21.450 (Eng WS 0700?-1300) SIO444 at 1200 by **Tom Smyth** in Co Fermanagh; Vatican R, Italy 21.710 (Port, Sp to S Am 1045-1215) 54444 at 1200 by **Robert Connolly** in Kilkeel.

After mid-day, RFI via Fr Guiana? 21.645 (Eng to C Am? 1200-1255) was 45554 at 1211 in Wallsend; HCJB Quito 21.455 (Eng, u.s.b.+ p.c.) 35454 at 1500 by **Ronald Kilgore** in Co Londonderry; BBC via Ascension Is 21.660 (Eng to Africa 0730-1745) 34333 at 1631 by **Rhoderick Illman** in Oxted; WYFR via Okeechobee 21.615 (Eng, Ger to Eu, Africa 1600-1800) SIO233 at 1730 by **Phil Townsend** in E London; also 21.500 (Eng to Eu, Africa 1700-1900) SIO333 at 1825 by **Sid Morris**

| Freq (kHz) | Station                | ILW | a.m.r.p | Listener                |
|------------|------------------------|-----|---------|-------------------------|
| 1161       | R Tay                  | I   | 1.40    | K.*L.*M*                |
| 1161       | HumberSide(Gt. Yorks)  | I   | 0.35    | K.*                     |
| 1170       | GNR Teeside            | I   | 0.32    | K.*L.*                  |
| 1170       | Portsmouth (SCR)       | I   | 0.12    | F.*N                    |
| 1170       | R Orwell (SGR)         | I   | 0.28    | B.F.*                   |
| 1170       | Signal R (S. Gold)     | I   | 0.20    | C.F.*K.*O.P             |
| 1242       | Invicta Sound(Coast)   | I   | 0.32    | B.F.I.*O.*R             |
| 1242       | Isle of Wight R        | I   | 0.50    | F.L.*N                  |
| 1251       | Saxon R (SGR)          | I   | 0.76    | B.F.*K.*L.*R            |
| 1260       | Brunel R (Cl. Gold)    | I   | 1.50    | F.M.*N.R                |
| 1260       | Sunrise R              | I   | 0.29    | B.F.O.R                 |
| 1260       | Marcher Sound (Gold)   | I   | 0.64    | C.F.L.*P                |
| 1278       | Bradford (Gt. Yorks)   | I   | 0.43    | F.Q                     |
| 1305       | Barnsley (Gt. Yks)     | I   | 0.15    | B.C.F.P                 |
| 1305       | Red Dragon (Touch)     | I   | 0.20    | F.*                     |
| 1323       | R Bristol (Som. Sound) | B   | 0.83    | F.*L.*                  |
| 1323       | Brighton (SCR)         | I   | 0.50    | B.F.L.*N.R              |
| 1332       | Hereward R (WGMS)      | I   | 0.60    | B.F.R                   |
| 1332       | Wiltshire Sound        | B   | 0.30    | F.G.L.*N.P.R            |
| 1359       | Essex R (Brazeax AM)   | I   | 0.28    | B.F.L.*M.*R             |
| 1359       | Mercia Sound(Saxa AM)  | I   | 0.27    | F.O.P                   |
| 1359       | Red Dragon (Touch)     | I   | 0.20    | F.G.L.*M                |
| 1359       | R Solent               | B   | 0.85    | F.L.*N.R                |
| 1368       | R Lincolnshire         | B   | 2.00    | A.B.C.F.I.*             |
| 1368       | R Sussex & Surrey      | B   | 0.50    | B.F.N.R                 |
| 1368       | Wiltshire Sound        | B   | 0.10    | F.L.*N                  |
| 1413       | Sunrise R              | I   | 0.125   | B.D.F.J.N               |
| 1431       | Essex R (Breeze AM)    | I   | 0.35    | B.F.L.*M.*N.R           |
| 1431       | R 210 (Cl. Gold)       | I   | 0.14    | F.L.*N.R                |
| 1449       | R Peterborough/Cambis  | B   | 0.15    | B.L.L.*M.*N.P.R         |
| 1458       | R Cumbria              | B   | 0.50    | L.*M                    |
| 1458       | R Newcastle            | B   | 2.00    | K                       |
| 1458       | Sunrise R              | I   | 50.00   | B.C.*D.E.F.*J.*K.*L.*R  |
| 1476       | County Sound           | I   | 0.50    | B.F.I.*K.*L.*M.*N.*O.*R |
| 1485       | R HumberSide           | B   | 1.00    | B.F.*N.R                |
| 1485       | R Merseyside           | B   | 1.20    | F.*K.*L.*M.O            |
| 1485       | R Sussex & Surrey      | B   | 1.00    | B.F.N.R                 |
| 1503       | R Stoke-on-Trent       | B   | 1.00    | B.F.K.L.*M.*O.*Q*       |
| 1521       | Reigate (City Sound)   | I   | 0.64    | B.F.I.*K.*L.*M.*N.P.R   |
| 1530       | Sheffield (Gt. Yks)    | I   | 0.74    | F.K.*L.*M*              |
| 1530       | R Essex                | B   | 0.15    | B.F.N.R                 |
| 1530       | R Wyvern (WYVN)        | I   | 0.52    | F.N.O.P                 |
| 1548       | Capital R (Cap G)      | I   | 97.50   | B.F.*N.Q.R              |
| 1548       | Liverpool (City G)     | I   | 4.40    | L.*M                    |
| 1548       | R Forth (Max AM)       | I   | 2.20    | B.*F.*K.*L.*            |
| 1557       | Chiltern R (Gold)      | I   | 0.76    | K.O                     |
| 1557       | Southampton (SCR)      | I   | 0.50    | F.K.*L.*N.R             |
| 1557       | R Lancashire           | B   | 0.25    | K.*L.*M.O*              |
| 1557       | Tendring (Mellow)      | I   | ?       | B.F                     |
| 1584       | Kettering (KCBC)       | I   | 0.04    | F.*                     |
| 1584       | R Nottingham           | B   | 1.00    | B.F.L.*                 |
| 1584       | R Shropshire           | B   | 0.50    | F.O.P                   |
| 1584       | R Tay                  | I   | 0.21    | F.K.L.*M*               |
| 1602       | R Kent                 | B   | 0.25    | B.F.K.*L.*M.*N.O.P.R    |

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

Listeners:  
A:Leo Barr, Sunderland.  
B:Clive Boutell, Overcourt.  
C:Martin Dale, Stockport.  
D:John Eaton, Woking.  
E:Alec Griffiths, Inverness.  
F:Gerry Haynes, Bushey Heath.  
G:Francis Hearne, N Bristol.  
H:Simon Hockenull, E Bristol.  
I:Sheila Hughes, Morden.  
J:Rhoderick Illman, Oxted.  
K:Ross Lockley, Stirling.  
L:Eddie McKeown, Newry.  
M:Mary McPhillips, Co Monaghan.  
N:George Millmore, Wootton, I.O.W.  
O:Sid Morris, Rowley Regis.  
P:Martin Price, Shrewsbury.  
Q:Tom Smyth, Co Fermanagh.  
R:John Wells, East Grinstead.

in Rowley Regis; R Nederland via Bonaire 21.590 (Eng to W Africa 1730-2025) 45433 at 1950 in Brenchley.

R Australia has also been reaching the UK in the 17MHz (16m) band. Their Darwin broadcast to S Asia on 17.695 (Eng 0700-0900) was heard by **Cyril Kellam** in Sheffield. While beaming to S Asia from Carnarvon on 17.750 (Eng 0700-0900) the signal was 34333 at 0736 in Bushey Heath.

In the morning the occupants of this band include R Pakistan, Islamabad 17.900 (Eng to Eu 0800-0845) 44444 at 0800 in Morden; R Japan via Yamata 17.860 (Eng to Oceania 0900-1000) 33433 at 0930 by **Mary McPhillips** in Co Monaghan; Voice of Greece, Athens 17.525 (Gr, Eng to Aust 0800-0950, to Japan 0950-1050) 44544 at 0950 by **Martin Dale** in Stockport; Africa No.1, Gabon 17.630 (Fr, Eng to W Africa 0700-1600) SIO222 at 1007 in Rotherham; R Pakistan 17.900 (Eng to Eu 1100-1120) SIO212 at 1100 in Co Fermanagh; Israel R, Jerusalem 17.575 (Eng to W Eu, USA 1100-1130) 33333 at 1103 by **Leo Barr** in Sunderland; BBC via Woofferton 17.640 (Eng to E Eu, India, Africa 0800-1500) 21211 at 1115 by **Peter Pollard** in Rugby.

Later, AIR via Delhi? 17.387 (Tam to SE Asia 1115-1245) was 32332 at 1220 in Kilkeel; RCI via Sackville, 17.820 (Eng to Caribbean 1300-1400) 54444 at 1310 in Norwich; BBC via Limassol 17.895 (Eng to E Africa 1400-1530) 54434 at 1408 in Co Londonderry; BBC via Ascension Is 17.880 (Eng to Africa 1400-2030) 24322 at 1512 in Islington; HCJB Quito 17.890 (Eng to USA 1130-1600) 23332 at 1545 by **Micheal Griffin** in Ross-on-Wye; RTM Tanger, Morocco 17.595 (Fr to M East, N Africa 1400-1700) 55544 at 1620 in Brenchley; WEWN, Birmingham 17.510 (Eng to Eu 1600-1700) 53544 at 1650 in Bridgwater; HCJB Quito 17.790 (Eng to Eu

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# NORBRECK

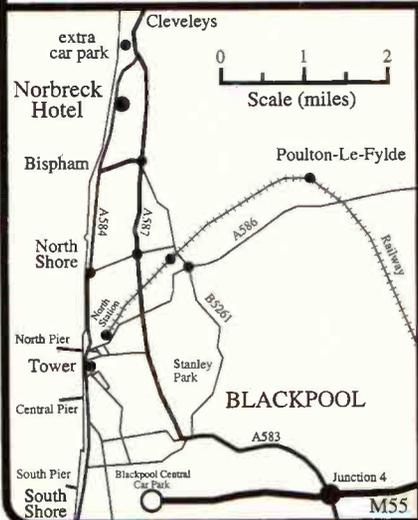
## Radio, Electronics and Computing Exhibition

by the Northern Amateur Radio Societies Association at the

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QUEENS PROMENADE, NORTH SHORE, BLACKPOOL**

**on Sunday, March 20th, 1994**

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# Long Wave Chart

| Freq (kHz) | Station        | Country      | Power (kW) | Listener                             |
|------------|----------------|--------------|------------|--------------------------------------|
| 153        | Bechar         | Algeria      | 1000       | N*,O*                                |
| 153        | Donebach       | Germany      | 500        | A,B,C,D*,F*,G*,I*,J*,L,M*,N,P*,O*,R* |
| 153        | Brasov         | Romania      | 1200       | B*,D*,I*                             |
| 162        | Allouis        | France       | 2000       | A,B,V,D*,F*,I*,J*,L,M*,N,O*,P*,Q*,R* |
| 162        | Agri           | Turkey       | 1000       | B*                                   |
| 171        | Kaliningrad    | Russia       | 1000       | B,D,E*,L,M*,R*                       |
| 171        | Medi 1-Nador   | Morocco      | 2000       | D*,N*,O*                             |
| 171        | Minsk          | Belarus      | 1000       | B*                                   |
| 177        | Oranienburg    | Germany      | 750        | A,B,C*,D*,E,F*,J*,L,M*,N,P*,R*       |
| 180        | Poliatti       | Turkey       | 1200       | B*,I*                                |
| 183        | Saarfous       | Germany      | 2000       | A,B,C,D*,F*,I,J,L,M*,N,O*,P*,Q*,R*   |
| 189        | Caltanissetta  | Italy        | 10         | A*,O*                                |
| 189        | Tbilisi        | Georgia      | 500        | A                                    |
| 198        | Warsaw 3       | Poland       | 200        | I*                                   |
| 198        | BBC Droitwich  | UK           | 500        | A,B,C,F,I,J,L,M,O*,P*,Q*,R*          |
| 198        | BBC Westergien | UK           | 50         | B                                    |
| 207        | Munich         | Germany      | 500        | A,B,D,E,F*,I,J*,L,M*,N,P*,R*         |
| 207        | Reykjavik      | Iceland      | 100        | B                                    |
| 207        | Azilah         | Morocco      | 800        | B*,O*                                |
| 207        | Kiev           | Ukraine      | 500        | D*                                   |
| 216        | RMC Roumoules  | S France     | 1400       | A,B,D*,F*,I*,J,L,M*,N,O*,Q*,R*       |
| 216        | Oslo           | Norway       | 200        | B*,D*,F*,I*,N*,P*                    |
| 225        | Raszyn Resv TX | Poland       | ??         | A,B,D*,E*,I,L,M*,N,Q*,R*             |
| 234        | Beidweiler     | Luxembourg   | 2000       | A,B,C*,D*,F*,I,J,L,M*,N,O*,P*,Q*,R*  |
| 234        | St Petersburg  | Russia       | 1000       | B*,I*                                |
| 243        | Kalundborg     | Denmark      | 3000       | A,B,D,E,F*,I,L,M*,N,O*,Q*,R*         |
| 243        | Alma-Ata       | Kazakhstan   | 500        | K*                                   |
| 243        | Erzurum        | Turkey       | 200        | A*                                   |
| 252        | Tipaza         | Algeria      | 1500       | B*,C*,L,O*,Q*,R*                     |
| 252        | Atlanic 252    | Eire         | 500        | A,B,C,D,H,I,J,L,M,N,P*,Q,R*          |
| 261        | Burg           | Germany      | 200        | B,D*,E*,F*,L,N,Q*,R*                 |
| 261        | Taldom(Moscow) | Russia       | 2000       | A,B*,M*,N,Q*                         |
| 270        | Topina         | Slovak Rep   | 1500       | A,B,O,E,F*,I,L,M*,N,Q*,R*            |
| 279        | Ashkhabad      | Turkmenistan | 150        | A*,B*                                |
| 279        | Minsk          | Belarus      | 500        | A,B,D*,I,L,M*,N,P*,R*                |

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

- Listeners:**
- A: Ted Barry, N London.
  - B: Tim Bucknall, Congleton.
  - C: Martin Dale, Stockport.
  - D: John Eaton, Woking.
  - E: Simon Hockenhill, E Bristol.
  - F: Sheila Hughes, Morden.
  - G: Rhoderick Illman, Oxted.
  - H: Ronald Kilgore, Co Londonderry.
  - I: Eddie McKeown, Newry.
  - J: Mary McPhillips, Co Monaghan.
  - K: Roy Merrall, Dunstable.
  - L: George Millmore, Wootton, IoW.
  - M: Sid Morris, Rowley Regis.
  - N: Frad Pallant, Storrington.
  - O: Alan Roberts, Quebec, Canada.
  - P: Tom Smyth, Co Fermanagh.
  - Q: Andrew Stokes, Leicester.
  - R: Phil Townsend, E London.

# Transatlantic DX Chart

| Freq (kHz)                       | Station          | Location             | Time (UTC) | DXer          |
|----------------------------------|------------------|----------------------|------------|---------------|
| <b>USA</b>                       |                  |                      |            |               |
| 660                              | WFAN             | New York, NY         | ?          | F             |
| 770                              | WABC             | New York, NY         | ?          | F             |
| 850                              | WHDH             | Boston, MA           | ?          | F             |
| 870                              | WWL              | New Orleans, LA      | 0140       | E             |
| 1010                             | WINS             | New York, NY         | 0112       | D,E,F,H       |
| 1050                             | WEVD             | New York, NY         | 0206       | O,E,F         |
| 1090                             | WBAL             | Baltimore, MD        | ?          | F             |
| 1130                             | WBRR             | New York             | 0132       | D,E,F,G       |
| 1500                             | WTOP             | Washington, DC       | ?          | F             |
| 1510                             | WLAC             | Nashville, TN        | ?          | F             |
| 1510                             | WSSH             | Boston, MA           | 0230       | A,F           |
| 1560                             | WQEW             | New York             | ?          | F             |
| <b>Canada</b>                    |                  |                      |            |               |
| 560                              | CHVO             | Carbonear, NF        | ?          | F             |
| 580                              | CJFX             | Angonish, NS         | 0330       | E,F           |
| 590                              | VDCM             | St John's, NF        | 2200       | F             |
| 600                              | CBNA             | St Anthony, NF       | ?          | F             |
| 620                              | CKCM             | Grand Falls, NF      | ?          | F             |
| 650                              | CKGA             | Gander, NF           | ?          | F             |
| 690                              | CBF              | Montreal, PQ         | 0215       | A             |
| 710                              | CKVO             | Clareville, NF       | ?          | F             |
| 740                              | CHCM             | Marystown, NF        | ?          | F             |
| 750                              | CBGY             | Bonavista Bay, NF    | ?          | F             |
| 920                              | CJCH             | Halifax, NS          | ?          | F             |
| 930                              | CFBC             | St John, NB          | 0108       | C,E,F,I       |
| 930                              | CJYO             | St John's, NF        | 0330       | A,B,C,O,E,F,H |
| 940                              | CBM              | Montreal, PQ         | ?          | F             |
| 1010                             | CFRB             | Toronto, ON          | 0003       | E             |
| 1050                             | CHUM             | Toronto, ON          | ?          | F             |
| 1140                             | CBI              | Sydney, NS           | ?          | F             |
| 1290                             | CHRM             | Matane, PQ           | ?          | F             |
| 1375                             | RFO              | St Pierre/Miquelon   | 0356       | A,F           |
| 1380                             | CKPC             | Brantford, ON        | 0400       | A             |
| 1400                             | CBG              | Gander, NF           | ?          | F             |
| 1410                             | CIGD             | Pt Havesbury, NS     | ?          | F             |
| <b>C America &amp; Caribbean</b> |                  |                      |            |               |
| 1610                             | Caribbean Beacon | The Valley, Anguilla | 0300       | E             |
| <b>South America</b>             |                  |                      |            |               |
| 950                              | YVKG R. Vision   | Caracas, Venezuela   | 0121       | F             |
| 1470                             | R Vibración      | Carúpano, Venezuela  | ?          | F             |

- DXers:**
- A: Ted Barry, N London.
  - B: Ron Damp, E Worsthing.
  - C: Ron Galliers, Islington.
  - D: Gerry Haynes, Bushey Heath.
  - E: Matthew King, Barnstable.
  - F: Paul Logan, Lisneskea.
  - G: John Parry, Northwich.
  - H: Roy Patrick, Derby.
  - I: Darran Taplin, Brenchley.

# Station Addresses

- Radio Diff. TV Congolaise, Boite Postale 2241, Brazzaville, Republic of Congo.
- CD603, Churchill Studios, Churchill Road, Cheltenham Gloucestershire GL53 7EP
- Radio Maldwyn, The Studios, Newtown, Powys FY16 2NZ.
- Virgin Radio, No.1 Golden Square, London W1R 4DJ.
- Radio Station CBV, P.O.Box 610, Corner Brook, Newfoundland A2H 6G1.
- Radio Station CJCB, P.O.Box 1270, Sydney, Nova Scotia B1P 6K2.

1900-2000) 44444 at 1905 in Oxted; R Nederland via Bonaire 17.605 (Eng to W Africa 1930-2025) 44233 at 1930 in Newry.

Good reception from many areas was noted in the **15MHz (19m)** band in the UK. R Australia on 15.565 (Eng to S Asia 1100-1300) was logged as SIO444 at 1220 by **Philip Rambaut** in Macclesfield. Their Carnarvon broadcast to N Asia on 15.170 (Eng, Chin, Cant 0900-1400) was SIO233 at 1100 in Edinburgh.

Also heard in the morning were R Korea, Seoul 15.575 (Eng to USA 0800-0830) SIO333 at 0800 in Sheffield; R Moscow Int. 15.540 (Eng WS 0700-1000) SIO444 at 0815 by **Francis Hearne** in N Bristol; China R Int, Beijing 15.100 (Chin to NE Asia, S Pacific 0900-0957) 33233 at 0908 in Islington; RFI via Allouis 15.300 (Fr to Africa 0600?-2155) SIO322 at 1100 in Rotherham; SRI via Schwarzenburg 15.505 (Eng, Fr, Ger to Far East, SE Asia 1100-1230) 22222 at 1102 in Newry; Israel R, Jerusalem 15.640 (Eng to Eu, USA 1100-1130) 55544 at 1105 in Bridgwater.

In the afternoon RFI via Issoudun 15.155 (Eng to C/E Eu 1200-1300) was 34433 at 1211 in Wallsend; R Finland via Pori 15.400 (Eng to USA 1230-1300) SIO444 at 1230 in Co Fermanagh; AIR via Aligarh 15.050 (Chin to China 1145-1315) 33333 at 1240 in Kilkeel; UAE R Dubai 15.395 (Eng to Eu 1330-1350) 54433 at 1330 in Ross-on-Wyke; Israel R, Jerusalem 15.640 (Eng to W Eu, USA 1400-1425) 55444 at 1420 in Co Monaghan; RCI via Sines 15.325 (Eng to Eu, Africa, M East 1430-1500) 55444 at 1450 in Co Londonderry; BBC via Sackville 15.260 (Eng to USA 1400-1745) 44333 at 1532 in Bushey Heath; WWCR, Nashville 15.685 (Eng to Eu 1100-0000) SIO333 at 1535 in Rowley Regis; R Prague, Czech Rep 15.505 (Eng 1600-1627) 54343 at 1612 in Norwich; Channel Africa, Johannesburg 15.240 (Eng to Africa 1500?-1755) 34333 at 1703 by **Vera Brindley** in Woodhall Spa.

Later, RNB Brasilia, Brazil 15.265 (Eng, Ger to Eu 1800-2055) was 34433 at 1800 by **Ross Lockley** in Stirling; HCJB Quito 15.270 (Eng to Eu 1900-2000) 44233 at 1905 in Oxted; BBC via Ascension Is 15.105 (Ha to Africa 1800-1945) 35444 at 1935 in Storrington; also 15.400 (Eng to Africa 1500-2315) 33222 at 2100 by **Bernard Curtis** in Stalbridge; R Havana Cuba 15.165 (Eng to Eu 2100-2200) 44333 at 2130 in Morden; RTL via Junglinster 15.350 (Ger to USA 24hrs) 25232 at 2250 by **John Eaton** in Woking.

Potent signals from many areas reached here in the **13MHz (22m)** band. R Australia via Darwin in 13.605 (Eng, Chin to Asia 0900-1400) was 45444 at 1110 in Woking and 13.755 from Carnarvon (Kh, Eng to S Asia 1230-1430) 24423 at 1359 in Sunderland.

Some of the signals to Europe came from R Korea, Seoul 13.675 (Eng 0800-0900) 54444 at 0820 in Norwich; R Austria via Moosbrunn 13.730 (Ger, Eng, Fr, Sp 0500?-1900) SIO444 at 0830 in N Bristol; Croatian R, Zagreb 13.830 (Cr [Eng 1305-1307] 24hrs) SIO333 at 1305 in Rotherham; R Prague, Czech Rep. 13.580 (Eng 1600-1627) 44444 at 1600 by **George Tebbits** in Penmaenmawr; UAE R Dubai 13.675 (Eng 1600-1640) 24222 at 1637 in Woodhall Spa; WHRI, South Bend, 13.760 (Eng 1700-0000) 34232 at 1954 in Bushey Heath; R Kuwait via Kbad 13.620 (Eng 1800-2100) 14431 at 2000 in Stirling.

While beaming to other areas, AWR (KSDA) Agat, Guam 13.720 (Chin to Asia 0900-1000) 33333 at 0915 in Morden; SRI via Sottens? 13.685 (It, Eng, Fr, Ger to Aust, S Pacific 0830-1030) 54444 at 0917 in Oxted and 13.635 (Eng, Fr, Ger to Far East, SE Asia 1100-1230) 31344 at 1130 in Stockport; Monitor R via KHB1 13.615 (Eng

to Oceania 0800-1000) 22322 at 0943 in Islington and via WCSN 13.770 (Eng [Fr Sun] to Africa 2000-2057) 34323 at 2050 in Bridgwater; WJCR, Upton, 13.595 (Eng to USA) 22332 at 1250 in Kilkeel; WYFR, Okeechobee 13.695 (Eng to USA 1300-1400) 44433 at 1348 in Brenchley; R Nederland via Flevo 13.700 (Eng to S Asia 1330-1625) 22222 at 1547 in Rugby; R Pakistan Islamabad 13.590 (Eng to M East 1600-1630) 45233 at 1606 in Newry; WWCR, Nashville 13.845 (Eng to USA, 1200-0100) SIO333 at 1758 in Macclesfield; VOA via Selebi-Phikwe 13.710 (Eng to Africa 1600-2200) 35443 at 1902 by **Tim Allison** in Middlesbrough.

Several of R Australia's **11MHz (25m)** outlets have been heard in the UK: 11.720 via Brandon (Eng to Pacific 0800-0900) was 24542 at 0859 in Wallsend; 11.660 (Eng to S Asia 1430-2055) 43332 at 1430 in Stalbridge & 1.855 (Eng to SE Asia 2100-0000) 34433 at 2100 in Brenchley, both via Carnarvon; 11.695 via Shepparton (Eng to Pacific 1430-2055) 21232 at 1519 in Islington; 1

Also received here were KTWB Agana, Guam 11.805 (Eng to S Pacific 0855-1000), logged as 43333 at 0855 in Morden; HCJB Quito 11.925 (Eng to S Pacific areas 0730-1130) SIO344 at 1120 in Edinburgh & (Eng to Caribbean 1130-1230) SIO333 at 1200 in Rowley Regis; Voice of the Mediterranean 11.925 (Eng, Ar to N Africa 1400-1600) 44333 at 1403 in Sunderland; R Pakistan, Islamabad 11.570 (Eng to M East 1600-1630) SIO322 at 1605 in Rotherham; SRI via Sottens? 12.035 (Eng, Fr, It, Ger to Africa 2000-2200) 24332 at 2000 in Oxted; R Gaucha, Porto Alegre, Brazil 11.915 (Port 24hrs) 44444 at 2200 in Stirling; R Nac da Amazonia, Brazil 11.780 (Port 0900-0200) 34222 at 2300 in Bridgwater; R Bandeirantes, Sao Paulo, Brazil 11.925 (Port 0700-0500) 33443 at 0025 in Kilkeel.

Programmes for European listeners were noted from R Romania, Bucharest 11.940 (Eng 1300-1400) 55555 at 1300 by **Clare Pinder** while in Appleby; Polish R, Warsaw 11.815 (Eng 1300-1355) 55555 at 1320 in Norwich; RCI via Sines 11.915 (Eng 1430-1500) 54545 at 1435 in Co Monaghan and via Sackville 11.945 (Eng 2130-?) SIO332 at 2130 in N Bristol; VDA via Gloria 11.805 (Russ to CIS 1800-2200) SIO444 at 1852 in Macclesfield; R Finland via Pori 11.755 (Eng 1930-2000, also to M East, Africa) 25232 at 1939 in Co Londonderry; AIR via Bangalore 11.620 (Eng, Hi 1745-2230) 35323 at 2051 in Woodhall Spa; R Damascus, Syria 12.085 (Eng 2008-2108) 34333 at 2100 in Newry; R Japan via Moyabi 11.925 (Eng 2100-2155) 34232 at 2100 in Middlesbrough; Israel R, Jerusalem 11.585 (Fr, Sp, Eng 2130-2300, also to USA) 44444 at 2130 in Rugby

R New Zealand's **9MHz (31m)** broadcast to Pacific areas from Rangataiki on 9.700 (Eng 0650-1206) was 33333 at 0813 in Sunderland and SIO233 at 1100 in Edinburgh. They may also be heard later on 9.655 (Eng to Pacific areas 1650-1850) SIO333 at 1655 in Bushey Heath. R Australia's Carnarvon broadcast to Asia was noted on 9.510 (Eng, Chin 0900-1100) as 22222 at 0952 in Islington; also 9.770 from Shepparton (Eng 1430-1600) SIO443 at 1535 in Rowley Regis. The Shepparton transmission to Pacific areas on 9.580 (Eng 0800-2130) was 34543 at 1210 in Wallsend.

During the broadcast to Europe R Nederland via Flevo 9.650 (Eng 1130-1325) was SIO443 at 1245 in N Bristol; RFI via Allouis 9.805 (Eng to C/E Eu 1200-1300) 55444 at 1250 in Woodhall Spa; Croatian R via Deanovec 9.830 (Cr 24hrs, Eng 1303-1306) SIO322 at 1305 in Rotherham; BBC via Limassol 9.660 (Eng 0700-1515) 44533

# Tropical Bands

| Freq (MHz) | Station                | Country          | Time (UTC) | DXer              |
|------------|------------------------|------------------|------------|-------------------|
| 2.310      | ABC Alice Springs      | Australia        | 1915       | F,G,I,LS          |
| 2.325      | ABC Tennant Creek      | Australia        | 1910       | F,G,I,R,S         |
| 2.340      | Fujian 1, Fuzhou       | China            | 2215       | F                 |
| 2.410      | R Transamazônica       | Brazil           | 0005       | O                 |
| 2.485      | ABC Katherine          | Australia        | 2025       | G                 |
| 2.850      | KCBS Pyongyang         | N Korea          | 2035       | FL                |
| 3.200      | TWR Ndebele            | Swaziland        | 1850       | L                 |
| 3.205      | AIR Lucknow            | India            | 1538       | G                 |
| 3.210      | Em. Nacional, Maputo   | Mozambique       | 1843       | L                 |
| 3.220      | CPBS 1, Beijing        | China            | 2205       | F,G               |
| 3.220      | R Togo, Lomé           | Togo             | 2031       | D,I,L             |
| 3.230      | R Nepal                | Kathmandu        | 1606       | L                 |
| 3.230      | R Orange               | S Africa         | 1845       | L                 |
| 3.235      | AIR Guwahati           | India            | 1631       | L                 |
| 3.240      | TWR Shona              | Swaziland        | 1847       | I,L               |
| 3.245      | AIR Itanagar           | India            | 0030       | D,F,G             |
| 3.245      | R Gulf, Kerema         | Papua New Guinea | 1940       | F                 |
| 3.250      | R Pyongyang            | N Korea          | 1658       | G,L               |
| 3.255      | BBC via Maseru         | Lesotho          | 2009       | I,L               |
| 3.270      | SWABC 1, Namibia       | SW Africa        | 2042       | I,L               |
| 3.276      | R S Highlands, Mendi   | Papua New Guinea | 1930       | F                 |
| 3.277      | AIR Srinagar           | India            | 1640       | F,I,L             |
| 3.290      | SWABC 2, Namibia       | SW Africa        | 0035       | D                 |
| 3.300      | R Cultural             | Guatemala        | 0108       | D,F,H,L           |
| 3.315      | AIR Bhopal             | India            | 1645       | D,F,G,I,L         |
| 3.318      | SLBS Godefrich         | Sierra Leone     | 2140       | B,L,O,P,S         |
| 3.320      | Pyongyang              | N Korea          | 1610       | G,L               |
| 3.325      | FRCN Lagos             | Nigeria          | 2300       | C,D,L,P           |
| 3.345      | AIR Jammu              | India            | 1501       | I                 |
| 3.355      | AIR Kurseong           | India            | 0000       | F,G,I,L           |
| 3.356      | R Botswana, Gaborone   | Botswana         | 1840       | H,L,R             |
| 3.365      | R Rebelde, La Julia    | Cuba             | 0155       | D                 |
| 3.365      | AIR Delhi              | India            | 2115       | F,G,H,I,L         |
| 3.365      | BBC R-2                | Ghana            | 1642       | C,D,E,L,O,P,R,S,U |
| 3.380      | R Chorlis, Jocotán     | Guatemala        | 0230       | D                 |
| 3.905      | AIR Kingsway(Feeder)   | India            | 1610       | H,I,L,T           |
| 3.915      | BBC Kranji             | Singapore        | 2157       | B,H,I,K,L,T       |
| 3.940      | PBS Hubei Wuhan        | China            | 2300       | D,F,G,I           |
| 3.945      | AIR Gorakhpur          | India            | 1545       | G,T               |
| 3.945      | Vatican Radio          | Italy            | 2050       | P,Q,T,U           |
| 3.950      | Gingha PBS, Xining     | China            | 2325       | F                 |
| 3.955      | BBC Skteton            | England          | 2305       | D,K,M,P,W         |
| 3.955      | Novosibirsk rly A.Ata  | Kazakhstan       | 0542       | LP                |
| 3.960      | Xinjiang PBS, Urumqi   | China            | 0040       | D,L               |
| 3.960      | RFE/RL Munich          | Germany          | 2240       | D,M               |
| 3.965      | RFI Paris              | France           | 2300       | D,M,P,R,W         |
| 3.980      | VoA Munich             | Germany          | 2310       | D,M,N,P,R,W       |
| 3.985      | China R via SRI        | Switzerland      | 2200       | K,M,V             |
| 3.985      | SRI Baromünster        | Switzerland      | 2100       | D,E,P,R,W         |
| 3.990      | Xinjiang BS, Urumqi    | China            | 1621       | L                 |
| 3.995      | DW via Jülich          | Germany          | 2300       | D,E,G,P,R         |
| 4.005      | RRI Padang             | Indonesia        | 1622       | L                 |
| 4.035      | Xizang PBS, Lhasa      | Tibet            | 0015       | D,F,G             |
| 4.409      | R Eco, Reyes           | Bolivia          | 0045       | O                 |
| 4.470      | R Movima               | Bolivia          | 0040       | D                 |
| 4.500      | Xinjiang BS, Urumqi    | China            | 2350       | C,D,G,H,L,M,T     |
| 4.650      | R Santa Ana            | Bolivia          | 0050       | D                 |
| 4.735      | Xinjiang Urumqi        | China            | 0050       | C,D,G,H,I,L,P     |
| 4.750      | Xizang BS, Lhasa       | Tibet            | 0055       | F,I               |
| 4.755      | R Educ Campo Grande    | Brazil           | 0105       | O                 |
| 4.755      | RRI Ujung Padang       | Indonesia        | 1445       | Q                 |
| 4.760      | Yunnan PBS, Kunming    | China            | 0008       | G,T               |
| 4.760      | AIR Port Blair         | India            | 1457       | I                 |
| 4.760      | ELWA Monrovia          | Liberia          | 2031       | H,I,L,M,O,P,R     |
| 4.760      | TWR                    | Swaziland        | 2139       | H,S               |
| 4.765      | Brazzaville            | Pep. Rep. Congo  | 2020       | C                 |
| 4.765      | RRI Medan              | Indonesia        | 1600       | Q                 |
| 4.770      | FRCN Kaduna            | Nigeria          | 1932       | C,G,H,J,L,O,P,R,S |
| 4.775      | R Gabon, Libreville    | Gabon            | 2021       | I                 |
| 4.775      | TWR Manzini            | Swaziland        | 1840       | Q                 |
| 4.780      | RTD                    | Djibouti         | 1846       | H,I               |
| 4.783      | RTM Bamako             | Mali             | 1938       | C,E,L,P,S         |
| 4.785      | Zhejiang PBS, Hangzhou | China            | 2325       | Q                 |
| 4.785      | Ecos del Combeima      | Colombia         | 0011       | Q                 |
| 4.785      | R Tanzania             | Tanzania         | 1902       | L                 |
| 4.790      | Azad Kashmir R         | Pakistan         | 0110       | D,I,L             |
| 4.790      | TWR Manzini            | Swaziland        | 1746       | I                 |
| 4.795      | La Voz de los Caras    | Ecuador          | 0234       | L                 |
| 4.800      | R Nac Amazonas         | Brazil           | 0020       | H                 |
| 4.800      | CPBS 2 Beijing         | China            | 2329       | E                 |
| 4.800      | R Popular Cuenca       | Ecuador          | 0137       | E                 |
| 4.800      | AIR Hyderabad          | India            | 1706       | I,L               |
| 4.800      | LNBS Lesotho           | Maseru           | 2026       | I,L               |
| 4.805      | R Nac Amazonas         | Brazil           | 2301       | C,D,F,L           |
| 4.810      | R San Martin Tarapoto  | Peru             | 0110       | O                 |
| 4.810      | R South-Africa         | S Africa         | 1943       | H,L,P             |
| 4.815      | R Ofusora, Londrina    | Brazil           | 0130       | O                 |
| 4.815      | China R, Beijing       | China            | 2310       | D,G,I,M           |
| 4.815      | R diff TV Burkina      | Ouagadougou      | 2140       | C,E,I,L,P,R,S     |
| 4.820      | La Voz Evangélica      | Honduras         | 0045       | D                 |
| 4.825      | R Cancao Nova          | Brazil           | 2335       | C,H               |

### DXers:-

- A:Tim Allison, Middlesbrough.
- B:Leo Barr, Sunderland.
- C:Darren Beasley, Bridgewater.
- D:Robert Connolly, Kikeel.
- E:John Eaton, Woking.
- F:Jim Edwards, Wigan.
- G:David Edwardson, Wallsend.
- H:Ron Galliers, N London.
- I:P. Gordon Smith, Kingston, Moray.
- J:Bill Griffith, while in Qatar.
- K:Robin Harvey, Bourne.
- L:Gerry Haynes, Bushey Heath.
- M:Sheila Hughes, Morden.
- N:Roderick Ilman, Dated.
- O:Ross Lockley, Stirling.
- P:Eddie McKeown, Newry.
- Q:Roy Merrill, Dunstable.
- R:Sid Morris, Rowley Regis.
- S:Fred Pallant, Storrington.
- T:John Parry, Northwich.
- U:Roy Patrick, Derby.
- V:Tom Smyth, Co Fermanagh.
- W:Phil Townsend, E London.

at 1425 in Co Monaghan; Polish R, Warsaw 9.525 (Eng 1600-1655) 34233 at 1604 in Newry; VOA via Gloria, 9.760 (Eng 1700-2100) 44444 at 1740 in Woking; R Bulgaria, Sofia 9.700 (Eng 1830-2000) 54444 at 1911 in Co Londonderry; China R Int, Beijing 9.920 (Eng 2000-2200), heard by **Julian Wood** in Elgin; Monitor R Int via WSHB, Cypress Creek 9.355 (Eng 1900-2200) 34222 at 2057 in Oxted; R Cairo via Abis 9.900 (Eng 2115-2245) 54444 at 2125 in Norwich; Israel R, Jerusalem 9.435 (Fr, Sp, Eng 2130-2300, also to USA) 54444 at 2200 in Rugby; VOFC Taiwan via WYFR 9.850 (Eng 2200-2300) 22222 at 2200 in Appleby.

Some broadcasts to other areas were also heard here: Voice of the

Mediterranean, Malta 9.765 (Eng, Ar 0600-0800) 44444 at 0640 in Morden; TWR Agana, Guam 9.785 (Chin to China 0900-1200) SIO322 at 1149 in Macclesfield; AIR Delhi 9.910 (Eng [News] 1530-1545) 54444 at 1530 in Penmaenmawr; SNBC Ondurman, Sudan 9.165 (Eng 1800-1900, Ar 1900-2200) 24322 at 1835 in Middlesbrough and 55555 at 2000 by **Bill Griffith** while in Doha, Qatar; DW via Trincomalee 9.670 (Eng to Aust, NZ 2100-2150) 34433 at 2100 in Brenchley; Yemen R, Sana'a 9.780 (Ar to M East 1000?-2145 [Eng 2100-2135]) 34444 at 2125 in Stirling; Voice of Greece, Athens 9.425 (Gr, Eng, Port, Sp to C/S Am 2200-2350) 34444 at 2245 in E Bristol; Voice of Turkey, Ankara 9.445 (Eng to USA 2300-0000)

SIO322 at 2300 in Co Fermanagh; UAE R, Abu Dhabi 9.605 (Eng to USA 2200-0000) 54434 at 2315 in Ross-on-Wye; R Cancao Nova, Brazil 9.675 (Port 24hrs) 43433 at 2325 in Bridgewater; R Nac del Paraguay 9.735 (Sp 0800-0400) 44444 at 0020 in Kikeel; RCI via Skelton, 9.670 (Eng to M East 0400-0430) 34443 at 0405 in E Worthing.

Quite a number of the **7MHz (41m)** signals are meant for Europe. Those noted came from AWR Forli, Italy 7.230 (Eng 0700-0800) 54444 at 0724 in Bushey Heath; WEWN, Birmingham 7.465 (Eng 0500-1000) was 45333 at 0800 in Ross-on-Wye; BBC via Tashkent 7.325 (Eng 1330-1545) 34444 at 1330 in Derby and via Woofferton 7.325 (Eng 2000-2200) 35443 at 2058 in Co Monaghan; Int Red Cross via SRI 7.210 (Eng 1700, last Mon) SIO433 at 1710 in N London; R Bulgaria, Sofia 7.455 (Eng 1830-2000) SIO444 at 1845 in N Bristol; Israel R, Jerusalem 7.465 (Eng 2000-2030, also to USA) 55555 at 2000 in Appleby; AIR via Aligarh 7.412 (Hi, Eng 1745-2230) 33333 at 2100 in Stalbridge; R Romania Int, Bucharest 7.195 (Eng, Ger 2100-2200) 44444 at 2115 in Middlesbrough; Monitor R Int via WCSN 7.510 (Eng 2100-0000, also to Africa) 44344 at 2147 in E Worthing; R Ukraine Int, Kiev 7.195 (Eng 2200-2300) SIO433 at 2200 in Co Fermanagh; RNE Spain 7.275 (Sp 2000-2300) 34333 at 2232 by **Robin Harvey** in Bourne.

Although intended for other areas, KTNB, Salt Lake City 7.510 (Eng to USA 0200-1600), 24232 at 0815 in Islington; WJCR, Upton, 7.490 (Eng to E USA 2100-1000) 33333 at 0920 in Morden; WHRI, South Bend 7.315 (Eng to E USA 0000-1300) SIO322 at 1000 in Rothenham; R Australia via Carnarvon 7.260 (Eng to S Asia 1430-2100) 54444 at 1630 in Penmaenmawr and 45444 at 1921 in Woking; VOA via Selebi-Phikwe 7.415 (Eng to Africa 1900-2200) 53443 at 1906 in Co Londonderry; Voice of Nigeria, Ikorodu 7.255 (Eng, Fr to W Africa 32322 at 2132 in Bridgewater.

While broadcasting to Europe in the **6MHz (49m)** band, HCJB Quito 6.205 (Eng 0700-0830) was 55555 at 0700 in Appleby; WEWN, Birmingham 5.825 (Eng 2200-1000) 43333 at 0700 in Stalbridge; R Pyongyang, Korea 6.576 (Fr 1600-1650, also to M East) 34553 at 1605 in Northwich; VOA via Woofferton 6.040 (Eng 1700-2200) 44434 at 1808 in Sunderland; R Sweden via Karlsborg 6.065 (Eng 1830-1855) 54434 at 1830 in Ross-on-Wye; Polish R, Warsaw 5.995 (Eng 1830-1855) 54444 at 1832 in Co Londonderry; R Finland via Pori 6.120 (Eng 1930-2000) 33433 at 1934 in Middlesbrough; China R Int, Beijing 6.950 (Eng 2000-2200) 44343 at 2035 by **P Gordon Smith** in Kingston, Moray; R Budapest, Hungary 6.110 (Eng 2200-2300) 44544 at 2200 in Stirling; WWCR, Nashville 5.810 (Eng 0000-0800) 34333 at 0158 in Woodhall Spa.

Also noted were R Bahrain, Manama 6.010 (Eng to M East 0300-2106), 34344 at 0600 in Doha, Qatar; R Australia via Shepparton 6.080 (Eng to S Asia 7-2100) 43444 at 2020 in Storrington; R Nederland via Flevo 6.020 (Eng to USA 2330-0100) SIO333 at 2330 in N Bristol.

Australia  
By Greg Baker



**B**ushfires in my area during the New South Wales bushfire emergency in January proved, yet again, the immense value of two-way radio communications. The opportunity to use v.h.f. and u.h.f. transceivers while fighting larger-than-normal fires gave us valuable lessons in fireground communications management.

In common with all bush fire vehicles in the area, our own water tanker is equipped with a multi-channel v.h.f. transceiver. This is primarily used for controlled traffic through our central Fire Control but can also be used, with permission, for flank communication between vehicles to speed message traffic. We also have a mobile u.h.f. 40-channel CB transceiver that is intended to take the load off v.h.f. for flank communications. Most vehicles in our area are similarly equipped and can keep in touch once a fireground channel is allocated. Our third line of communication is with three u.h.f. 40-channel hand-held transceivers. These can be used to maintain contact with tanker crew members working at a distance from the tanker.

Well that is the theory, but in the heat of the moment we all learned lessons about radio techniques, about the best use of communications time, about the proper selection of channels and about the need to have manageable and easy-to-remember call signs. And in a situation when a dozen or more vehicles are working the fire, we learned that all vehicles need to be externally labelled to ensure we know who we need to talk to.

Anyway that's all a bit removed from broadcast matters so I'll get on with the latest from down under.

## Radio Station Drama

On November 29, and much too late to make the *SWM* December deadline, Canberra radio stations FM104.7 and its a.m. sister station 2CA found themselves in the middle of a siege. A gunman, targeting the nearby place of employment of his ex-wife, had crashed a small truck containing gas bottles wired up to ignite on impact. The following hours found the gunman wandering around the building brandishing a shotgun, the building on fire and fire brigade and police officers ducking for cover outside.

The FM104.7 and 2CA studios eventually filled with smoke driving the staff to floor level for oxygen and the signals off air. When the smoke became too much a station staffer broke an outside window with a fire extinguisher and called for help. Police and ambulance rescue staff hurriedly erected a ladder and evacuated the staff while maintaining what cover they could from the gunman. The man was finally found dead inside and

the fire extinguished, but FM104.7 and 2CA were temporarily embarrassed for studios. Other radio stations leapt in to the breach for the fortnight it took for the studios to be declared safe for use. The Australian Broadcasting Corporation (ABC) were able to provide a spare studio for FM104.7. Station 2SSS-FM provided a mobile bus studio to 2CA for a week and the station operated from a shed for another week. And because the FM104.7 and 2CA music collection was inaccessible, members of the public came forward with CDs to tide the stations over the crisis.

As I write, the building is still undergoing reconstruction but the studio areas have been declared safe. Station staffers needed to dismantle and clean all equipment and repairs are still under way. However, the stations are on air from their own studios, the CD library was found intact and the station is making a massive Radio Rebuild campaign to restore services and listener numbers.

## Pay Television

If I ever promised to stop talking about this story I retract it now! As much as the government may wish the pay television issue to be settled and the story to vanish into the realms of the mundane it keeps popping up again with a fresh lease of life.

I reported last time that the then successful tenderers for the two available pay TV licences were being investigated by the Trade Practices Commission (TPC) and the Australian Broadcasting Authority (ABA) and had been given deadlines for payment of their tender amounts. UCOM, the successful tenderer for Licence A failed to meet the deadline and lost its \$A4.85 million (about £2 million) deposit. As it turned out UCOM had a yet lower bid in the tender process. UCOM eventually paid another deposit of \$A3.85 million (£1.6 million) on its lower bid of \$A77 million (£32 million). The ABA and TPC are yet to report on the suitability of UCOM.

The successful tenderer for Licence B, New World Communications, has been cleared by the ABA and TPC and has paid the balance of its \$A117 million (£49 million) bid. A third licence has been allocated to the ABC.

## ANARE Frequencies

**Maarten van Delft** from Utrecht in the Netherlands has taken me to task for supplying Australian National Antarctic Research Expeditions (ANARE) short wave frequencies. Maarten says that he thought ANARE went satcom a few years ago.

To check that out, I spoke to ANARE in Hobart and they confirm

that all communications between Australia and the four Australian bases - Casey, Davis, Macquarie Island and Mawson - is by satellite. Short wave transmissions were phased out by stages starting in 1988 as the more reliable satellite communications systems took over.

However, h.f. is still used for communications between the bases and ships at sea and field parties away from bases. Each base has an Icom M-700 transceiver. In addition, Mawson is equipped with a 10kW Collins WF80 transmitter, Casey and Davis with Dansk 1kW transmitters and Macquarie Island with a Racal 1kW transmitter. Field parties usually carry Codan 6924 transceivers and Macquarie Island huts are also equipped with these transceivers. Tractor trains carrying out continental traverses that can take three months to complete carry Icom M-700 transceivers.

The latest frequency list ANARE have given me is as follows: 3.023, 5.400, 6.850, 7.9225, 8.110, 9.940, 11.490, 12.1482, 14.415 & 15.845MHz. I am delighted to see my two previously announced frequencies on the list!! The main voice frequency is 5.400MHz. Other frequencies are used for voice or for SITOR in either ARQ or FEC modes.

You can QSL these to the relevant base C/-ANARE, Postmaster, Kingston, Tasmania 7050, Australia. For example, to QSL Casey write to Casey, C/- ANARE at the given address. Note however that ships only go to these bases in summer. The last ship left on 1 January 1994 and the next is not due to leave until October 1994. This means that there might be a long wait for a reply but I guess this is not an unusual situation for s.w.l.s to face.

If your budget stretches to it you could speed your reception reports by FAXing Davis on +672 10 657, Mawson on +672 11 757, Casey on +672 12 857 and Macquarie Island on +672 13 957.

## Transmitter Licences

Australia currently boasts 94 different types of transmitter licence and 10 types of receiver licence. These coupled with a fee structure with 131 different fees has prompted the Spectrum Management Agency to launch a public inquiry. The current system according to previous DoTC Minister David Beddall is outmoded and cumbersome. It is apparently too hard to administer, too hard to control and too hard to understand. The aim of the inquiry is to reform the apparatus licence system and to produce a more equitable, efficient and transparent licence fee system. The inquiry got under way in February and the report is due at the end of May 1994.

## New Guinea

I had hoped to bring some New Guinea news in this column before now but have found it extremely difficult extracting information from the Papua New Guinea National Broadcasting Commission (NBC). Now comes news in Australia's *Amateur Radio Action* magazine of a new 100kW NBC transmitter being used to improve the penetration of the Karai service throughout the country. Until this new transmitter was installed this service used the low power frequencies of 3.925 and 4.890MHz.

NBC is looking for reception reports but with Solar Cycle 22 riding inexorably into the west these will more likely be from the Asia Pacific area than further afield. The frequency in use is reported as 9.565MHz although it is expected that NBC will try other frequencies. My address for NBC is PO Box 1359, Boroko, National Capital District, Papua New Guinea. I should add that this address obtained from the Papua New Guinea High Commission in Canberra has yet to yield me a reply so best of luck to those who try!

## Station Closures

Now that most outback areas are well served with medium wave and v.h.f. f.m. broadcasting services the ABC has closed the outback short wave services VLQ, VLM and VLW. The Queensland transmitters of VLQ were opened in the late 1940s and the Western Australian transmitter at VLW kicked off in 1939. These three closures join two other ABC domestic short wave stations in the history books. Sydney's VLI and Melbourne's VLR both closed in the mid to late 1980s.

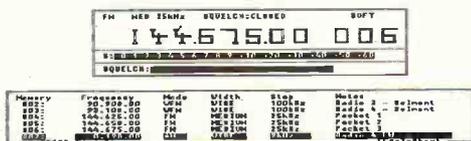
Although there is no talk of closing the three remaining ABC domestic short wave transmitters readers may want to consider bagging them soon. VL8T Tennant Creek is on 2.235 and 4.910MHz, VL8K Katherine is on 2.485 and 5.025MHz and VL8A Alice Springs is on 2.310 and 4.835MHz. All transmitters put out 50kW power and use the 2MHz frequencies during Northern Territory evenings and the higher frequencies during the day.

Reception reports for all three stations to ABC, GPO Box 9994, Darwin 0801, Northern Territory, Australia.

I welcome any news and comments. In particular I am interested in any s.w.l. information on Australian stations heard by *SWM* readers so I can chase up more details and interesting snippets from this end. My address is PO Box 208, Braidwood, NSW 2622, Australia. For personal replies please send 2 IRCs.

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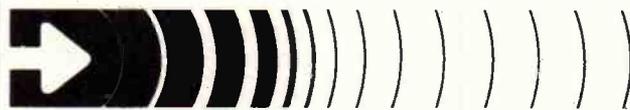
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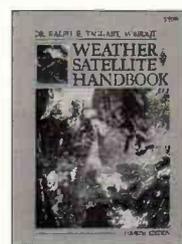
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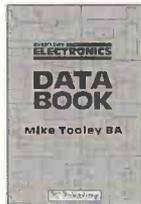
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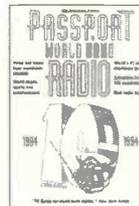
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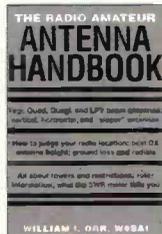
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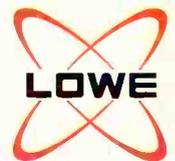
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