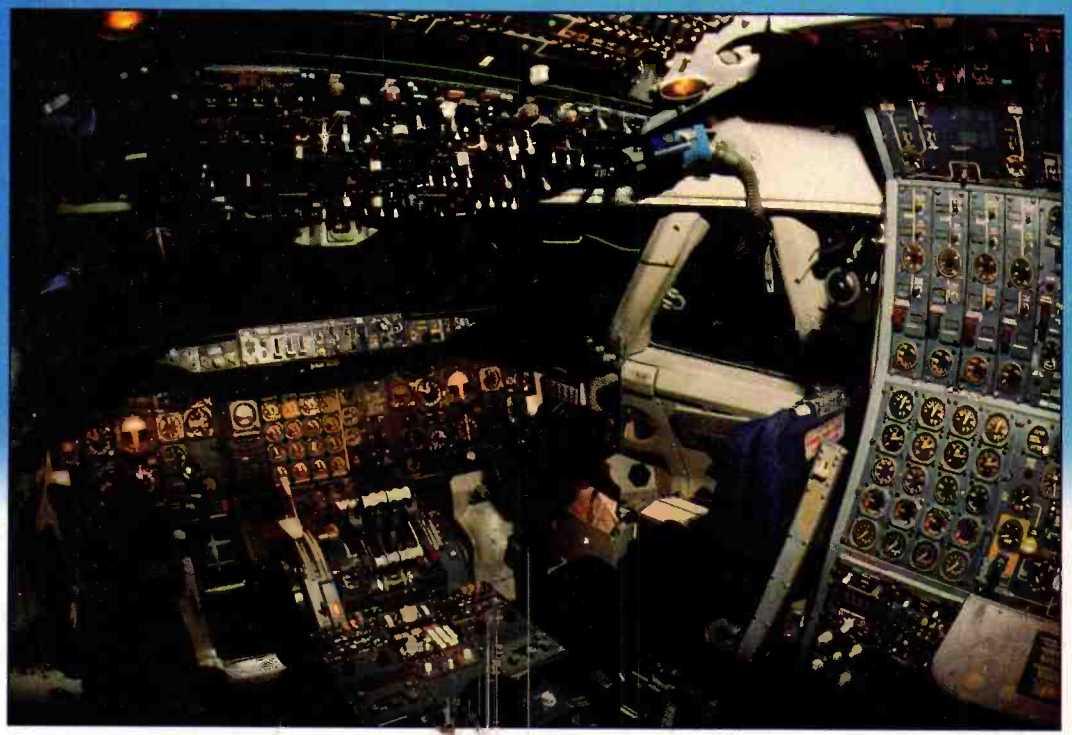
FOR THE RADIO LISTENER

short wave magazine

A Must for the Serious Listener

BUMPER AIRBAND SPECIAL



SELDEC SELCALL DECODER REVIEWED

HAM'STER - THE ULTIMATE ACCESSORY?

SPECIAL OFFER - NICADS AND CHARGER

AIRBORNE RADIO

A 747 FLIGHT - FROM THE COCKPIT

RADIO SECRETS - PART 2

April 1995 £2.25 ISSN 0037 - 4261

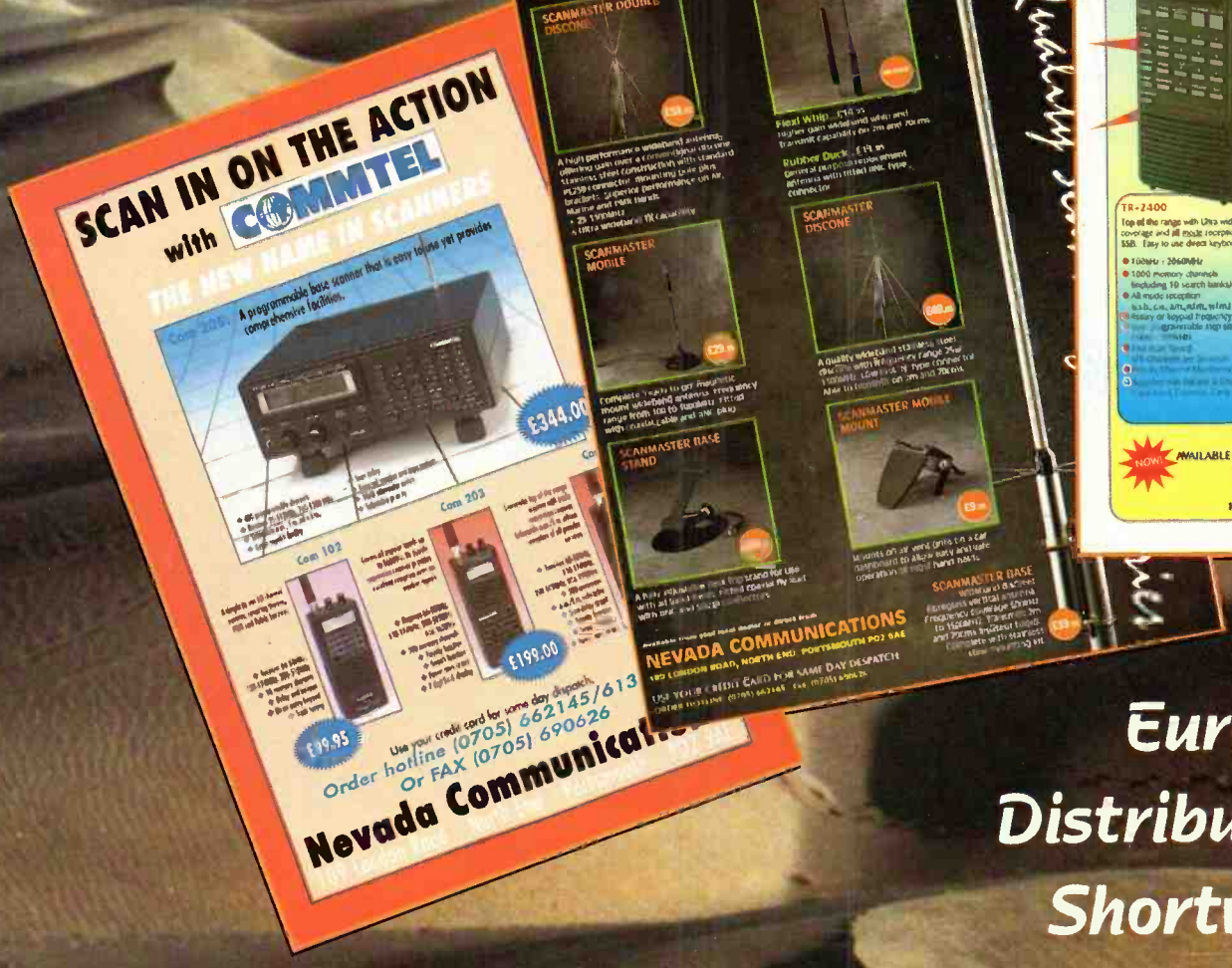
9 770037 426029 04

Plus Regular Features Covering

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

SCAN THE NE

Huge Stocks - Fast Delivery - Full Service Back-up



Fr
Europe's
Distributor
Shortwave

Retail Sales & Enquiries
Call Our Sales Hotline
(01705) 662145
Fax: (01705) 690626

NEVADA COM

189 London Road, P

VADA RANGE

Mail Order - Trade Department - Expert Staff

om
Leading
f Scanning &
Equipment

MUNICATIONS

ortsmouth PO2 9AE

Trade & Export Enquiries
Call Phil Jeffery
on
(01705) 698113
Fax: (01705) 690626

AOR™ The radio spectrum at your fingertips

The **AR3000A** has established itself as a high performance base mobile receiver offering an extremely wide frequency coverage of 100 kHz - 2036 MHz and all mode receive. The introduction of the **AR3000A PLUS** provides even greater performance and capabilities. What is the plus? Plus five custom modifications applied as standard: Switchable narrow AM filter for improved shortwave listening, switchable WFM filter for WEFAX reception, 10.7 MHz I.F. output and switch for compatibility with the SDU5000, tape relay with independent contacts and switched audio, discriminator output. Further custom modifications are available and may be applied to existing units. Simply request the descriptive leaflet and price menu for full details.

AR3000A PLUS £949

The **SDU5000** is a spectrum display unit designed with the AR3000A in mind. Locating brief transmissions has never been so easy, by using the MAX facility any transmission within ± 5 MHz may be identified and signal strength measured in dBm. A small modification is required to the standard AR3000A to provide compatibility but the **AR3000A PLUS** is ready to go. (The SDU5000 will also operate in conjunction with the AR3000 but facilities are reduced - a small modification to the AR3000 is still required). ***SDU5000 £699***

The **AR3030** is The New Classic of short wave receivers. Coverage is from 30 kHz - 30 MHz and all mode receive. The legendary 6 kHz mechanical AM filter is fitted as standard along with a 2.4 kHz Murata filter for SSB and an additional filter for NFM. Stability is excellent due to the standard fitting of a TCXO. Many options are available including VHF converters, Collins SSB, CW & AM filters, Concerto PC software etc. ***AR3030 £699***

The **AR8000 UK** receiver is without doubt the most full featured wide band hand held receiver on the market today. Frequency coverage is from 500 kHz - 1900 MHz without gaps and all mode reception. The display provides twin frequency readout and alphanumeric comments for memory and search banks. The receiver may also be operated via computer using the optional CU8232 interface. The AR8000 UK is a remarkable receiver.
AR8000 UK £426

Fast mail order available for direct orders. Most items are available from dealers throughout the UK and Eire.

The ***NEW*** **AR2700 UK** receiver is the very latest high-tech hand held receiver from AOR. Frequency coverage is 500 kHz - 1300 MHz with receive modes of NFM, WFM & AM.

A large LCD with three way rear illumination provides all operational details.
An optional **VOICE RECORD** chip RU2700 permits an **instant 20s digital recording off air** which may be replayed over and over again. Computer control is also possible by using the optional IF-ADP and CU8232 adaptor and interface unit.
AR2700 UK £269

AOR (UK) LTD, Adam Bede High Tech Centre, Derby Road, Wirksworth, Derbys. DE4 4BG ENGLAND Tel: 01629 825926 Fax: 01629 825927

short wave magazine

Vol. 53 ISSUE 4 APRIL 1995

ON SALE MARCH 23
Next issue on sale April 27

EDITOR: Dick Ganderton, C. Eng., MIEE, G8VFH
ASSISTANT EDITOR: Kevin Nice, BRS95787, G7TZC
EDITORIAL ASSISTANT: Zoë Shortland
ART EDITOR: Steve Hunt
LAYOUTS: Richard Gale

EDITORIAL
Arrowsmith Court, Station Approach, Broadstone,
Dorset BH18 8PW
Telephone: (01202) 659910
Facsimile: (01202) 659950

If you wish to send E-mail to anyone at SWM then our Internet domain name is:
pwpub.demon.co.uk
Simply add the forename of the person you wish to contact. For example:
dick@pwpub.demon.co.uk

BOOK SERVICE, SUBSCRIPTIONS, BACK ISSUES ETC.:
CREDIT CARD ORDERS: (01202) 659930
(Out-of-hours service by answering machine)

ADVERTISEMENT DEPARTMENT
ADVERTISEMENT MANAGER
Roger Hall G4TNT
Telephone: 0171-731 6222
Facsimile: 0171-384 1031
Mobile: (0585) 851385

ADVERTISEMENT DEPARTMENT(Broadstone)
Lynn Smith (Advertisement Sales)
Ailsa Turbett G7TJC (Advertisement Production)
Telephone: (01202) 659920
Facsimile: (01202) 659950

Cover Subject

British Airways Boeing 747 'Classic' cockpit and in flight. Photos courtesy of British Airways plc.

pw publishing ltd.

Features

The second part of the PRO-2035 competition will appear next month.

Regular Columns

Good Listening

SWM SERVICES

Subscriptions

Subscriptions are available at £25 per annum to UK addresses, £28 in Europe and £30 overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £42(UK) £47 (Europe) and £51 (rest of world).

Components for SWM Projects

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

The printed circuit boards for *SWM* projects are available from the *SWM* PCB Service, Badger Boards, 80 Clarence Road, Erdington, Birmingham B23 6AR. Tel: 0121 - 384 2473.

Photocopies and Back Issues

We have a selection of back issues, covering the past three years of SWM. If you are looking for an article or review, or whatever that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues are **£2.30** each, photocopies are also **£2.30** per article, plus **£0.50** for subsequent parts of serial articles.

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

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

Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Broadstone (01202) 659930. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Poole (01202) 659950.

Technical Help

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

editorial

Internet

You will probably have noticed, if you are one of those who read the 'masthead' on the Contents page, that we are now accessible on the Internet. this means that you can e-mail us at **pwpub.demon.co.uk** and leave us messages, etc. I don't know about you, but I think that the addresses look positively ugly - all lower case characters with no spaces to break up the monotonous strings of letters. Still, if it gives us all another means of communicating I suppose that it is all to the good.

However, the bad news for anyone who imagines that we will be publishing the entire magazine on the Internet is that we won't! We are actively looking at ways in which we can use the Internet to the best advantage of the readers, but this will not happen overnight.

Heathkit

In the recent review of the MFJ 2m Receiver Kit I referred to Heathkit as if the company had ceased to exist. However, we have just been informed by Ian Bassett-Smith of Cedar Electronics that this is not the case. Heathkit have simply withdrawn from the amateur market and no longer have a UK factory. They are still active in education and instrumentation and are represented in the UK by Cedar Electronics based in Cheltenham. Tel: (01242) 602402. I understand that Cedar can still provide support for Heathkit amateur radio products.

It's good to know that Heathkit is still alive and well.

Subscriptions

Our Subscription Manager, Kathy, has been generously pegging the subscription rates for *SWM*. However, her generosity runs out on 31 March 1995. This gives you a whole seven days from the on sale date of this issue to get your subscription in the post, thus saving yourself an extra £3 over and above the £2 saving you make with the new subscription rate. Go for it!

Dick Ganderton G8VFH

letters

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

Dear Sir

I read the letter from Mr Peter Waters (March *SWM*), regarding the h.f. performance of the Yupiteru MVT-7100 with great interest.

So, to get a good h.f. performance out of these wide band scanners, you must purchase a 20m long wire costing somewhere in the region of £20 plus, and then a balun at a cost of £19.95, then on top of that an a.t.u. (the type recommended in the letter) costing an extra £99.95! This works out at an extra £139 over and above the cost of the scanner, hardly 'a cheap solution' or 'simple additions'.

My point is that if the receiver needs extras costing that sort of money to get an acceptable performance, then why is it not advertised as such? I find that it is misleading advertising to say that a scanner will receive broadcasts on modes x, y and z, and not to be informed that before an acceptable performance can be obtained on mode x, one will need to spend an extra £140.

For someone on a low income who has spent £399.95 of hard earned cash on this receiver, only to be told later that before an acceptable performance can be had, in a certain mode, they will need to spend another £140, is unacceptable.

It is all right for the experienced listener to claim that this is obvious. It is anything but obvious for a beginner who looks through all the advertising before making a choice. Yes, I know the dealer should point this out but this does not always happen, as I can testify.

H. G. Miller
Norwich
Norfolk

We must not forget that there is always the low cost alternative to buying commercial solutions for the items mentioned. I'm talking about building your own-good old home construction. Has experimentation and wielding the soldering iron died out? - KN

Dear Sir

I am writing to see if any of your readers have had any trouble with the Police reporting the use of scanning equipment whilst out with it in their vehicles. Also, I would be interested to hear from anyone who has had their scanner seized by the Police or have been charged under the Wireless Telegraphy Act 1949 with the unlawful use of a scanner, and any outcome of any such cases.

I have a PRO35 scanner and have read that all frequencies other than TV and radio are illegal to listen to, as they fall under the p.m.r. bands. I would be very grateful if someone could let me know if this is the case and have any information on the above mentioned enquiries.

Miss V. Roberts
Stroud
Glos

letters

Dear Sir
It's enough to make one weep! The current issue of *SWM* dropped onto my doormat with its usual welcome thud at which I rose from my slumbers, scooped it up with the finesse of a 'deep square-leg' fielder and buried myself in the arm chair to read its contents.

'Another special' I remember observing to myself and a *What Scanner* pull-out as well... I almost began to purr with contentment for as I paged through the magazine I was confronted page after page of beautiful pictures of scanners.

One trader after another advertising the latest in hand-helds and the very best and newest in base stations. Whatever one was able to pay, be it in tens or hundreds of pounds, there was something to satisfy all buyers.

There was John Griffith's page on the subject of Scanning with some interesting frequencies to be tested at some time, and also Godfrey Manning with his update of frequencies for the air band enthusiast - all grist for the mill of the scanning fraternity.

If the day had begun on a high that euphoric beginning soon ended when I turned to the letters page and there with its sombre tones (I could almost hear the Church bells) was the letter from our friend D. S. J. German of the Radiocommunications Agency informing his readers of section 5(b) of the 1949 Act and the penalties to which those who were convicted of committing an offence under this section of the law were liable. What a topsy-turvey situation we find ourselves in!

Now, of course, I have always been mindful of this situation. What makes me so cross about the whole issue of scanners and the law is that the Authorities must know of the amount of money and interest that is involved in the scanner business and yet no attempt is made to update the legislation or to negotiate with the industry with a view to accommodating the thousands of scanner owners for whom this is a worthwhile, and in many cases, an all-consuming interest.

It seems utterly ludicrous that if I listen to two profaning lorry-drivers going about their daily work, I am committing an offence. If I choose to listen to a radio officer on an aircraft reporting a blocked toilet aboard his aircraft, I am committing an offence.

If I tuned to the VOLMET south to find what the weather is doing along the coast, I am committing an offence and so on, the examples are endless. Surely the Authorities must appreciate that no one would spend a 'small fortune' on radio equipment just to hear radio amateurs chatting away (as much as we love them) or CBers conversation.

Sir, I am not disrespectful toward authority, indeed at my age, (going on 73) I tend to support anything that curbs lawlessness, but I just cannot understand the rigid regulations that exist by which the pursuit of a hobby that is, in the main, harmless to all concerned, should bear such terrorising penalties.

I doubt if there is a scanner owner who does not continually 'commit an offence' in the pursuance of this hobby for to what else would he listen? In the final analysis it is not WHAT he hears, but the fact that he hears anything for in the ongoing attachment to scanner use it is the building of new antennas, the watching of weather and reading of the propagation signs and the sheer delight of hearing somebody miles away talking about the most mundane things that is the thrill of scanner participator.

I believe it is time for the whole matter to be reviewed in the light of the vast numbers of people involved in the hobby. I know there are those who misuse the whole idea of scanning for illegal purposes and they deserve the feel the whole weight of the law, but to endeavour to limit the pleasure of thousands of law abiding people (except for section 5(b) of the 1949 Act) cannot be right!

So, Mr Editor, this is my gripe, perhaps through the pages of our magazine, some approach could be made to the Authorities with a view to revising the law, or at least removing the shadow that forever hangs over the scanner owner as he/she pursues a hobby that whilst being far from inexpensive, is most satisfying. It is, as I say, enough to make one weep!

P.S. I think the withholding of my name and address might be wise, I don't want an unwelcome visitor!

What you do in the privacy of you own home is your business. By and large nobody can tell what frequencies your listening to. The laws regarding what you can listen to are there, for the best part, good and justifiable reasons. There is not space in these pages to deliberate fully on the subject. What I will observe is that I am a keen backpacker, I often camp where, strictly speaking it is not allowed. The point is, you can't tell that I've been there when I've broken camp! - 'nuff said-KN.

Dear Sir
Recently I decided to take out a policy with ARIS and as clause 7 of the policy stated that if there was any other insurance in force on my equipment, that they, ARIS would only meet part of the claim.

Having been advised when I took out a home contents insurance policy that I was covered through the AA insurance, I checked with Gan Minster Insurance. Surprise, surprise, I was told quite blunt that s.w.l. equipment was and never had been covered by either home contents or personal contents and that they didn't want to know anyway.

In short, if these items, worth roughly £2000, had been stolen, I could have had a nasty surprise. Through your excellent magazine, may I suggest that other s.w.l.s, etc. check as to how they stand with their own companies.
M. Gardiner
Hedge End
Southampton

Dear Sir
I have just been looking through my *Short Wave Magazine* and there is a piece on using a PC with your radio. I am writing to ask you if you know any firm that does a decoder for Morse code, with it coming up on the PC monitor?

I have got an Amstrad PCW 8512. I hope you can help.
K. Scott
Corby
Northants

There is a user group for PCWs. They can be contacted at, ***100 St. Peters Close, Morton-on-Lugg, Hereford HR4 8DW. Tel. (01432) 761861.***
However, is there anyone who knows of a Morse decoding program for the PCW?

Dear Sir
Most short wave listeners have probably come across the many publications offered free by Radio Netherlands. Their *Receiver Shopping List* and *Guide To Writing Useful Reception Reports* are helpful additions to any listening shack. They also produce a guide on *Latin American DXing* which includes a section on how to write a simple reception report letter in Spanish or Portuguese.

I have used this guide many times in the past, and have received replies from many Latin American stations. What I would like to know, is do any readers know of a likewise booklet for reception report writing in French? I would much prefer to write to African radio stations in their own countries language. Can anyone help please?
Tony Vaughan
Southampton

Any help via the Editorial Offices as usual, please.

Dear Sir
As a regular subscriber to your excellent magazine, I enjoyed the article 'Things They Didn't Tell Me' and the paragraph 'Pleasant Swing'.

During the war, I served with SCV8 (Special Communication Signals) and spent most of it receiving coded messages from England, and the 'FIST' on the key made all the difference. You eventually recognised the different operators and some of them, mates, who didn't come abroad, and to query this, if a group came up with first three letters of your surname, you IMId the group and a rapport was established.

This didn't happen often, and you had to be careful as we had our own monitoring stations listening. On the side of my particular wireless wagon was a notice saying that all German operators were shot for sending plain language. The article certainly brought back memories.
Bill Simpson
Lancaster

We are pleased that you enjoyed the article Bill. Perhaps you ought to pen some of your experiences and share them with the other readers!

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.*

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

March 26: Bournemouth Radio Society's 8th annual sale will be held at Kinson Community Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth. Doors open at 10am and close at 4.30pm. There will be a 144MHz talk-in from G1BRS on S22, amateur radio and computer traders, clubs and specialised groups, along with excellent refreshments. Admission is £1 which includes a free raffle. **Malcom G0UCX, QTHR** or **(01202) 747745.**

March 26: The Pontefract & District Amateur Radio Society are holding their 15th annual Components Fair and Spring Rally at the Carleton Community Centre, Carleton, Nr, Pontefract. Doors open at 11am to 4pm (10.30am for disabled visitors). There will be trade stands, a bookstall, Bring & Buy, a licensed bar and restaurant, all at ground level. Morse tests on demand (usual two passport sized photos required). Admission by prize programme, three prizes, plus ladies prize draw. **Colin G0NQE** on **(01977) 677006.**

April 2: The Feltham Sea Cadets Rally is being held at 2 Poplar Way, Feltham, Middlesex. Gates open at 10.30am (10am for disabled visitors). Entrance is £1, children under 14 accompanied by an adult, free. Refreshments available. Further details from **Alan G4GJV** on **(01784) 456486.**

April 9: Launceston's 9th Amateur Radio Rally is being held at Launceston College. There will be a Bring & Buy, Talk-in on S22 and Morse tests on demand (bring two passport photos). Hot snacks will be available from 7am. Doors open at 10.30am. Further information is available from **Roy G0IKC** on **(01409) 221624** or **Rodney G8HDW** on **(01566) 775167.**

April 9: The White Rose Amateur Radio Society will be holding their annual rally at a new venue, Leeds University. There will be the usual well known traders, a Bring & Buy, refreshments and Morse tests. Doos open at 10.15am for disabled visitors and at 11am for everyone else. There will also be a talk-in on S22. **Allen Bartram G7ELS** on **(01973) 189276.**

April 15: The Spring All Micro Show, Radio Rally & Electronics Fair is being held at Bingley Hall, Staffordshire Showground, Weston Road, Stafford (A518 Stafford-Uttoxeter Road), signposted from Junction 14 on M6. Admission for adults £2.50, children under 14, 50p, concessions - OAP's, RSGB members, student card, UB40, £1.50. As usual we are supporting local chairty stalls, free parking and a licenced bar from 11am. There will also be refreshments, meals and a cafeteria. For further details contact **Sharward Promotions, Upland Centre, 2 Upland Road, Ipswich IP4 5BT. (01473) 272002** or **FAX: (01473) 272008.**

April 16: The Cambridgeshire Repeater Group Amateur Radio Rally is being held at Philips Telecom - Catering Centre, St. Andrews Road, Chesterton, Cambridge. Doors open at 10.30am. There will be trade stalls, Bring & Buy and much more. Further information can be obtained from **Darren Slater G1ERM** on **(01223) 60601** evenings.

April 22: International Marconi Day special exhibition station at the Puckpool Park Wireless Museum, Seaview, Isle of Wight. Further info. from **Douglas G3KPO. (01983) 567665.**

April 23: The Bury Radio Society will be holding their annual rally at the Castle Leisure Centre, Bolton St, Bury. Doors open at 11am (10.30am for disabled visitors). There will be a Bring & Buy, a bar and refreshments. Talk in on S22. Further details are available from **G4KLT** on **0161-762 9308.**

April 23: Lough Erne Amateur Radio Club are holding their 14th mobile rally in the Killyhelvin Hotel, Enniskillen. All radio amateurs and those interested in Electronics and Computing are cordially invited to the rally. The usual traders will be there and also a Bring & Buy. Door tickets will be included in the raffle for worthwhile prizes. For more details contact **Fred GI4PCY** on **(01365) 324993.**

April 23: Swansea Amateur Radio Society are holding their Amateur Radio & Computer Show in the Swansea Leisure Centre, which is located on the A4067 Swansea-Mumbles coast road. Doors open at 10.30am. There will be trade stands, a Bring & Buy, operational h.f. and v.h.f. stations, S22 talk-in using GB2SWR plus full catering. **Roger GW4HSH. (01792) 404422.**

If you're travelling a long distance to a rally, it could be worth 'phoning the contact number to check all is well, before setting off. The Editorial staff of *SWM* cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers. If you have any queries about a particular event, please contact the organisers direct.

Editor

AVON

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

RSGB City of Bristol Group: last Tuesdays, 7pm. New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. March 28 - Talk on cellular radio, April 25 - VHF contesting. Dave Bailey G4NKT. 0117-967 2124.

South Bristol ARC: Wednesdays, 7.30pm. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. March 29 - Making a 'Fox Hunt' antenna by G6PJS, April 5 - Exhib 'The Matthew' boat - J. Cabot 500th anniversary, 12th - Lundy Group report, 19th - Club quiz night, 26th - History of W.D. & H. O. Wills. For more information ring (01275) 834282 on a Wednesday evening.

DERBYSHIRE

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. March 29 - Energy for the 21st century, talk by Mr J. Layne of the Institute of Physics, April 5 - Junk sale. Mrs Hayley Winfield, 2 Hilts Cottages, Crich, Matlock, Derbyshire DE4 5DD. (01773) 856904.

DEVON

Plymouth RC: Tuesdays, 7.30pm. The Royal Fleet Club, Devonport, Plymouth. March 28 - Business meeting and matter night, April 25 - Business meeting and natter night. F. P. Russell on (01752) 563222.

Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. March 24 - Operating contests by Derrick G3LHJ, April 21 - Trains and things by Peter G4VFG. Peter G4UTO. (01803) 864528.

EDINBURGH

Lothians RS: 2nd & 4th Wednesdays, 7.30pm. Orwell Lodge Hotel, Polworth Terrace, Edinburgh. April 12 - TVI and how to cure it, 26th - The Stockton Power Meter by Dave Stockton. GM4DIJ, QTHR on 0131-337 7311.

ESSEX

Vange ARS: Thursdays 8pm, Barnstable Community Centre, Long Riding, Basildon, Essex. March 23 - Steam engines, 30th - Talk by G7JRK, April 6 - Junk sale, 13th - Easter buffet (members & guests only), 20th - Natter night, 27th - Wartime radio equipment by G8CUN. Doris. (01268) 552606.

GRAMPIAN REGION

Aberdeen ARS: Fridays, 8pm. RC Hall, 70 Cairngorn Crescent, Kincorth. March 24 - Video of the '1994 CQ-World-wide DX SSB Contest', 31st - A different language, talk by Phil Watson, April 7 - Junk sale. Martin GM0JCN. (01569) 731177.

GREATER LONDON

Edgeware & DRS: Thursdays, 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak. March 23 - Morse training evening plus topical discussion, April 13 - Expedition to the roof of Africa by Terry Robinson G3WUX, 27th - Morse training evening, plus topical discussion. Rod Bishop. 0181-204 1868.

Southgate ARC: 2nd & 3rd Thursdays, 7.30pm. The Pavilion, Winchmore Hill Cricket Club, Firs Lane, Winchmore Hill, London N21 3ER. March 23 - LAR&C show debrief plus club on the air, April 13 - Grand surplus equipment sale, 27th - Club radio on the air. M. E. Viney G0ANN. (01707) 850146.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road SW19. March 31 - Basics of packet radio by G4WYJ. Michael J. McCarthy G0AWQ. (01737) 351313.

HAMPSHIRE

Fareham & DARC: Wednesdays, 7.30pm. Portchester Community Centre, Portchester, Hants. March 29 - Get together on the air. (01730) 829206.

Horndean & DARC: 1st & 4th Tuesdays, 7.30pm. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. March 28 - Early history of telecommunications, April 4 - Club night. S. Swain (01705) 472846.

HEREFORD & WORCESTER

Bromsgrove ARS: 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. March 28 - Talk on propagation, April 11 - Night on the air, 25th - Antennas/Baluns/Chokes. Barry Taylor. (01527) 542266.

KENT

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. April 18 - First aid. A Messenger G0TLK. 0181-777 0420

Maidstone YMCA ARS: Fridays, 8pm. YMCA Sports Centre, Melrose Close, Maidstone, Kent, ME15 6BD. March 24 - RAE Morse tuition and club night, 31st - Junk sale, April 7 - RAE Morse tuition and club night, 11th - Dummy Morse test, plus one hours coaching, 14th - Antenna maintenance, 21st - RAE Morse tuition and club night, 25th - Dummy Morse test, plus one hours coaching. (01622) 743317.

Medway AR & TS: Fridays, 7.30pm. Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham, Kent. March 25 - MARTS annual dinner. G3VUN, 40 Linwood Avenue, Strood, Rochester, Kent ME2 3TR. (01634) 710023.

LINCOLNSHIRE

Lincoln SW Club: Wednesdays, 8pm. City Engineer's Club, Waterside South, Lincoln. April 12 - Junk sale. Pam G4STO. (01427) 788356.

MERSEYSIDE

Wirral ARS: 1st & 3rd Wednesdays at Ivy Farm, Arrowe Park, Birkenhead, Wirral. Informal natter nights on each Tuesday. April 5 - An introduction to ATV, 19th - Direction finding with demonstration. A. Seed G3FOO on 0151-644 6094.

NORFOLK

Norfolk ARC: Wednesdays, 7.30pm. Formal and informal meetings at The Norman Centre, Bignold Road, Off Drayton Road between 'Asda' and Three Mile Cross Roundabout, Norwich. March 29 - Night on the air/construction QRP/Morse practice and committee meeting, April 5 - Formal AGM, 12th - Night on the air/construction QRP/Morse practice and committee meeting, 19th - Commercial broadcast TV cameras by Ian G4FOS, 23rd - Surplus equipment sale, 26th - Night on the air/construction QRP/Morse practice. Mike G4EOL. (01603) 789792.

NOTTINGHAMSHIRE

South Notts ARC: Fridays, 7pm. Highbank Community Centre or Fairham Community College, Farnborough Road, Clifton Estate, Nottingham. March 24 - Talk on l.f. propagation by Chris Burbanks G3SJJ, 31st - On air h.f. and v.h.f. plus construction, April 7 - Junk auction by Julian G0LXX, 14th - Talk on The SNARC Organisation for Peak '95 by Julie G0SOU, 21st - Open forum - members only. Julie Brown G0SOU. (01509) 672734.

OXFORD

Oxford & DARS: 2nd and 4th Wednesdays, 7.45pm. The North Oxford Grove House Club. Terry Hastings G0CFN. (01865) 863526.

SHROPSHIRE

Salop ARS: Thursdays, 8pm. Oak Hotel, Shrewsbury. March 23 - SARS open evening and on air event, April 6 - Construction competition, 20th - 1st fox hunt, 27th - RAE tuition and workshop evening. Ian Davies G7SBD, QTHR. (01743) 463711.

SOMERSET

Yeovil ARC: Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. March 23 - Constructors contest adjudication by G3BPM, 30th - Committee meeting and club station on the air, April 6 - An off air frequency standard by G3PCJ, 13th - Grey line propagation by G3MYM, 20th - AGM, 27th - 1st meeting of new committee and club station on air. Cedric White, QTHR. (01258) 473845.

TAYSIDE

Dundee ARC: Tuesdays, 7pm. Dundee College, Graham Street, Dundee. March 28 - Cellular 'phones, April 18 - Local commercial radio, Radio Tav, 25th - Construction evening. Allan Martin GM7ONJ, 11 Langlee Place, Broughty Ferry, Dundee, Tayside DD5 3RP.

WARWICKSHIRE

Stratford-upon-Avon & DRS: 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. March 27 - Surplus sale, April 10 - AGM, 24th - Visit to BBC Sutton Coldfield. Martin Rhodes G3XZO. (01789) 740073.

WEST MIDLANDS

Sandwell ARC: The Broadway, Warley. RAE class on Monday nights, Morse class on Wednesday nights and RAE Novice class on Thursday nights. Three operating shacks, h.f./v.h.f./u.h.f., Phone, c.w., RTTY, AMTOR, Packet, all bands. Talks, outings, contest and demonstrations. For further information please ring 0121-552 4619/0121-552 4902.

WEST YORKSHIRE

Denby Dale ARS: Wednesdays, 8.30pm. Pie Hall, Wakefield Road, Denby Dale, West Yorkshire. April 5 - Diving by Barry G4TML and Frank G1FBC, 19th - Parachute Mobile by Roy G4CMT. Denby Dale ARS also provides RAE, Morse and Novice RAE classes and is a registered City & Guilds examinations centre for both the RAE and Novice RAE exams. Further details from the examinations secretary Brenda G4OTE on (01484) 424776 or secretary Kevin G1FYS on (01484) 547553 for club activities.

Keighley ARS: The Ingrow Cricket Club, Ingrow, Keighley. Thursdays, 8pm. March 23 - Natter night, 30th - Desert island disk drive, April 6 - Night on the air, 13th - Visit to Gooseye Brewary, 20th - Natter night, 27th - Junk sale. Kathy G0RLO. (01274) 496222.

WILTSHIRE

Trowbridge & DARC: 1st & 3rd Wednesday, 8pm. The Southwick Village Hall, Southwick, Trowbridge. April 5 - Visit by members of the Severnside TV Group, presenting an insight into amateur TV. Ian G0GRI. (01225) 864698.

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

junior listener

Thank you for all the letters I've received this month, I'll use as many as I can and reply to all of you in the next few days.

Rallies

Chris Carrington, the ISWL Publicity Officer, has written with the dates of some rallies that the ISWL will be attending.

March 11/12 - Picketts Lock (LARS)
March 19 - Norbreck, Blackpool
April 15 - All Micro Show, Birmingham
May 28 - Elvaston Castle Mobile Radio Rally, Derby
June 25 - Longleat Amateur Radio Rally, Wiltshire
July 8 - Plymouth Amateur Radio Rally
June 11 - Cornish Amateur Radio Rally
August 19/20 - Staffordshire Hamfest
September 3 - TARRG, Telford

International Short Wave League members will be on hand to answer questions, enrol new members or just for a chat. Also, all the ISWL publications will be on sale. So, if you have been thinking whether or not it will be worth your while joining a short wave listening group, drop in to a rally and have a chat with them. I'm sure you'll find them very welcoming.

Who's That?

A question that puzzles many new listeners is, how do you know who you are listening to? Now, if you are listening to a local radio station, whether it be near or far, there isn't usually much time in between them mentioning the stations name - what with jingles, news, etc. So working out who is who on the local radio front is comparatively simple.

If you are interested in listening to radio amateurs that's usually pretty simple to. They **should** be giving their callsigns frequently even in the longest of conversations.

The trouble is the same doesn't always apply to short wave stations. Another added problem is that they often use relay stations for their programmes. That means that Station A buys time using Station B's transmitters so they can reach a wider audience. That is sometimes why you can hear Radio Japan very, very clearly - they are using transmitters in the UK!

Working out which station you are hearing can take a bit of detective work, and when you are new to the hobby where do you get the information from? You first should arm yourself with a good short wave frequency book, by that I mean *WRTH* or *Passport to World Band Radio*, or the like. This will be well worth the money you invest in buying it if you are taking the hobby up seriously. The next problem is how to 'drive' the book you've bought!

Let's assume you have found an interesting station - I didn't say rare, just interesting to you. The best thing to do is

listen for a while - on the hour or half hour are very productive times as often there are news bulletins or programme changes at that time. Make sure you have a notebook and pen handy too and jot down points of interest:

What is the programme about?

What records did they play?

Did the presenter say anything worth noting?

It's better to have too much information than not enough. Don't forget to write down the date, time (UTC, of course) and frequency, too. When you think you've got all the information you can and you have finished listening to the programme, then the detective work starts. Sometimes you are lucky and you will hear the station give their ident or perhaps they will play a signature tune. If you can, write it all down.

Time to use the books now, your chosen frequency guide should have a list of stations in frequency order. That's a good place to start, make a note of all the stations that use that frequency (and the one either side too, just to be on the safe side). Then look them up in the rest of the book.

I've been using the *WRTH* for years and years now and so am most comfortable with that format. I look up such information as what announcement to they make (such as 'Yo Radio Nepal Ho' in Nepali and 'This is the Voice of Radio Nepal' in English). If I heard a signature tune I see what the book has to say about that, was it played on the guitar, or did they use conch shell, violin, piano and Jaltarang (as The Voice of Nepal does).

Hopefully, by now you will have been able to narrow things down a bit. Then you can look to see when and where they are transmitting to and from at the appropriate time of day. What language could they have been using, does that fit the picture. I know this sounds very long-winded but you soon get very quick at 'sensing' whether a station is a likely candidate or not.

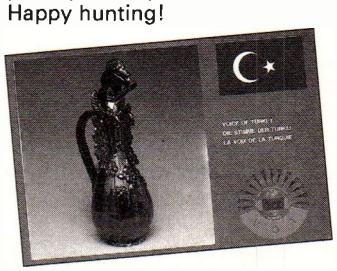
Once you have decided who you were listening to, you have to decide whether you are going to QSL or not. When you are first starting out in this hobby, I think it's a great feeling when the postman brings the envelope with the foreign postmark. When you open it there is a new QSL card from a country you've been listening to. Even after all my years in radio I still like getting QSL cards! A good frequency guide will tell you how the station verifies reports - by QSL card, do they accept a recording you send as proof of reception. It will also tell you whether the station requires things like an IRC before they will reply to you!

Now, no frequency guide can be 100% accurate, as soon as they publish a new volume, a broadcaster somewhere in the world changes either his frequency or times or some other detail. So if you write to a station it's a good idea to ask for their latest frequency schedule that will give you the most up-to-date information you can get. Sometimes, your name will then be added to their mailing list and you will get sub-sequent up-dates when they are issued.

When you write to a station, please don't send them an 'epic' for a reception report, and don't send something the size of a large postage stamp either! Try to find your own way of doing the report, make it interesting, include enough detail of their programming to show it was them you heard, tell them what you though of the programme (be honest), how was the reception (don't lie here either) and finally tell them a little about yourself.

If you are studying North America for your geography GCSE (as I did) and you are QSLing a North American station, tell them. You never know, the person sending out the QSL cards might feel sympathetic and include a few extra goodies that you can use in your project. Don't be greedy, I have heard of listeners asking for 'a pen, sticker, baseball cap, T-shirt and anything else you can send'!

If you get any interesting QSL cards or even interesting packages, drop me a line. Happy hunting!



Who Can Help

Finally, a plea for assistance. David Haigh is a parent governor of his local junior school and has got some of the children interested in short wave listening. Unfortunately, even though the other governors are behind the idea of starting short wave listening projects, the funds to do this aren't available. The children involved are between 9 and 10 and are keen to get going.

David wonders if any readers have old radio, a.t.u.s, maps, log books, callsign books, frequency books or anything else these children could use to get going. If so, drop him a line at 43 Brow Bottom Lane, Mixenden, Halifax, West Yorkshire HX2 8TE.

I'll have a word with the Editor and see how generous he's feeling, David. Best of luck.

news

For the latest in the World of Listening

1995 Christian Conference

The World Association of Christian Radio Amateurs and Listeners, WACRAL, are holding their 1995 conference at the Highbury Hotel in Weston -Super-Mare.

The Conference will be held over the weekend of Friday 29 September to Sunday 1 October. A full programme of Christian and radio related events has been organised for the conference, not least of which the WACRAL AGM. There will be on-air activities with the club call G3NJB. Cost for attendee is £70 including all meals and accommodation. For full details regarding the conference and WACRAL contact: **Dr Geoff Petersen, G4EZU, 124 Darnley Road, Gravesend DA11 0SN.**

Jersey Special Event Station

The Jersey Amateur Radio Society will be running a special event to commemorate the 50th Anniversary of the Liberation of Jersey from Wartime Occupying Forces. The station callsign of GJ50LIB awaits confirmation. operating will take place from the club's unique headquarters, a Radio Relay Station, built by the German Forces during the five year occupation of Jersey. The call will be active during the first week of May, and particularly on the 6th and 7th.

Drake Welcome News Sales Manager

The R L Drake Company has appointed Mr Manuel Yais as Sales Manager of their European Office in Barcelona, Spain. Mr Yais will manage Drake accounts throughout Europe and North Africa, he will assist distributors in purchasing products, keep them well appraised of Drake communications equipment, and support them in Drake's international marketing programs.

"Manuel will be able to better service our European and African clients by spending more personal time with them. Working out of our Barcelona office allows Manuel to give these accounts the face-to-face attention that we in the United States, cannot", says International sales Manager, Dan Albrecht.

The R L Drake Company has been a leader in the communications field since 1943, and manufactures a diverse line of products including consumer satellite equipment, commercial communications equipment and radio communications equipment. For more information in Europe contact the **Barcelona Office, Drake Europe, Dr Trueta 1-3 Entresuelo, 08860 Castellfels, Spain. Tel. +(34) 3 636 0192, Fax. +(34) 3 636 0152.**

ISWL Rally Calendar 1995

The International Short Wave League will be attending the following rallies during the year, members will be on hand at the stands to answer questions and enrol new members or just chat.

15 April	All Micro Show, Staffordshire
28 May	Plymouth Amateur Radio Rally
11 June	Elvaston Castle Mobile Radio Rally
25 June	Longleat Amateur Radio Rally
8 July	Cornish Amateur Radio Rally Truro
19 & 20August	Staffordshire Hamfest
3 September	TARRG Telford

Europa Competition

Left to right Richard Mclachlan Lowe MD, looks on as Mike Wootton is presented with his prize by *SWM* Editor Dick Ganderton.

As we announced last month, the winner of our grand competition for the Lowe Europa was Mike Wootton of Staffs. Mike was presented with his Europa at Lowe's HQ in Matlock, and was delighted to have won such a magnificent receiver. He commented that the Europa was on the top of his shopping list for when he won the National Lottery. Shame you didn't win the Lottery Mike but at least you've got your Europa. Mike was also treated to a tour of the Lowe factory where all the receivers are built - we hope to bring you a report of this next month.
The answers to the four questions for all of you who entered are as follows:
1. Flevo
2. Offenbach Meteo
3. Two, a) first i.f. - 45MHz, (b) second i.f. - 455kHz.
4. HF125.

Commiserations to all of you who were not lucky enough to win, better luck next time!

Your news and product details can reach thousands of listeners, drop a line to Kevin. Post, Fax or E-mail accepted.

UK Station Testing On 2.4045MHz

We have just received the following item. A 12-month Test & Development licence has been issued by the UK Radiocommunication Agency (part of the Department of Trade & Industry) to Bessemer Broadcasting of Sheffield, for low-power test transmissions on 1.413MHz and on the unusual frequency of 2.4045MHz in the 120 metre short wave band. The tests consist of music and announcements. The station has been allocated a UK test callsign of G9CDP.

The broadcasts are a joint venture between the Chapel Green Community College and its radio society, Hatley Antenna Technology of Aberdeen and Bessemer Broadcasting. A very short (4 metre) transmission antenna will be used, designed by Hatley.

Broadcasts on 1.413MHz began in early February and on 2.4045MHz in mid February. Power is only around 1 watt, but good reception has been reported from as far as the south coast of England on 2.4045MHz.

Reception reports should be sent to:
Bessemer Broadcasting, 52 Hampton Road, Fir Vale, Sheffield S5 7AN.

news

Radio and TVDX News

More TVDXing potential in Poland with a second batch of independent local TV licences being issued Spring '95 with at least 150 radio and 25 TV frequencies up for grabs. Less happy is the news that the prime TVDX catch Bydgosczc ch.R1 in Poland has been moved to ch.R4.

Madagascar is to have its own MMDS (terrestrial microwave distribution) PAY-TV service and installation will start shortly by the South African 'Aerial Empire' company. There's a new ZBC short wave transmitter site just opened at Guinea Fowl, Gweru, in Zimbabwe. One transmitter radiates Radio 2, the other carries daytime Radio 4 and at night time Radio 3 within a 1500km radius.

The Russian government has advised the broadcasting media to 'provide the official point of view of the government'. The authorities are far from happy in that the newly independent stations are transmitting the good and bad news concerning Russia - such as the casualties from the Chechyan conflict - where-as the official trumpets such as Ostankino gloss over the real facts.

Yleisradio - YLE are selling off the TV/radio distribution networks into private ownership to raise cash for funding YLE's move into digitising the radio and TV system. In another Scandinavian move, Norway's NRK is seeking independence from the government. NRK has suffered a considerable fall off in audiences following the opening of the independent TV2 commercial channel. Once free from government control, NRK can develop both TV services to compete effectively against the new commercial stations. A second commercial network 'TV+' opens soon. Other moves for independence - the Albanian president has called for the establishment of private radio and TV stations, partly subsidised by the State and part commercial though having no responsibility to the government.

The Urals Electromechanical Plant at Ekaterinburg will shortly be manufacturing CDs with five-colour printing on the discs. This is the second CD manufacturing plant in Russia and is the centre for general consumer electronic manufacture such as VCRs and laser disc players. High CD prices result in press runs of up to 3000 discs, recordings are provided from both Russia, Germany and the UK.

Hungary switches from PAL to SECAM totally by January 1996. The first PAL transmissions started December 22 1994, all of the TV2 network from January 2 1995 and the 1st network January 1 1996. Iran will carry a teletext service via IRIB TV from March 20th 1995.

Bad news for Asian TVDXers with the loss of the AFKN American Forces Korean Network TV on ch.A2, it's now moving to ch.A34 UHF at 30kw erp, the old ch.A2 allocation will be returned to KBS.

A move by UK Maxfield Productions to buy the TV broadcasting franchise for Gibraltar. GBC will retain the news operation and Radio Gibraltar; all other programme making and presentation - and the activities at Straits Television - will be taken over by Maxfield. The sum of £800,000 is thought to be on offer.

British Amateur TV Club (BATC) ATV contests upcoming are :-

Spring Vision Saturday 11th March @ 1800 to Sunday 12th @ 1200, all bands;

'Summer Fun' Saturday 10th June @ 1800 to Sunday 11th @ 1200, 24cms and higher;

The International Saturday 9th September 1800 to Sunday 10th @ 1200 - all bands;

Check out also Summer Cumulatives , the last Sunday in each month 0800-1300GMT, all bands...April 30; May 28; June 25; July 30; August 27 and September 24. ALL TIMES GMT.

£50 Prize Draw

Yet another lucky book buyer comes up trumps. This month's £50 note goes to Mr D. O'Hanlon of Waterford, Eire. Congratulations to Mr O'Hanlon who joins the line of readers to get his books FREE. You too could be a winner, so hurry and place that order now.

Javiation Internet and WWW

Javiation claim to be the first UK radio dealer to offer a World Wide Web version of their catalogue. This format provides a graphical means of information presentation. The Web page consists of 'Hypertext links', similar to Windows help pages, which can allow access via the Web to other sites around the world. The on-line catalogue index page can be found on the Internet at **http:\\www.demon.co.uk\javiation** clicking on an entry shown on this page will present the user with more details and or more links. Javiation can also be contacted via E-Mail at **clough@javiaton.demon.co.uk** - only if you have access to an Internet account though. If you haven't then try, **Javiation, Carlton Works, Carlton Street, Bradford, West Yorkshire BD7 1DA. Tel: (01274) 732146. Fax: (01274) 722627.**

National Transmitter News

Television Relay Stations

February 2 Chideock, Dorset a new relay station opened provided jointly by the BBC and the ITC. The station is located on a 21m mast alongside the northern end of Langdon Lane, to the north west of Chideock. It is designed to bring good television reception to around 420 people in North Chideock and Chideock itself, and provide a secondary service to some parts of Morecombelake where remote antennas and wired systems may benefit from a better signal source - note a different polarisation is used in this direction.
Viewers who wish use the new Chideock relay should consult a local television dealer or antenna contractor, but reception advice is also available from ITC and BBC engineering at the addresses below.

Station Details		
Channels:	BBC 1 (South West)	49
	BBC 2	45
	ITV (West Country)	39
	Channel 4	42
Antenna Group:	B	
Polarisation:	Vertical - Chideock	
	Horizontal - Morecombelake	
Effective Radiated Power: (vertical)		8W
0.9W (horizontal)		

Reception advice is available from either:

BBC Engineering Information
White City
201 Wood Lane
London W12 7TS
Tel: 0181-752 5040

ITC Engineering Information
Kings Worthy Court
Kings Worthy
Winchester
Hampshire SO23 7QA
Tel: (01962) 848647

E-mail us @pwpub

We now have our permanent Internet address and you may have guessed from the heading that our domain name is 'pwpub.demon.co.uk'. To address mail to anyone at the Editorial Offices just add their forename to the domain name, e.g. **kevin@pwpub.demon.co.uk** to send mail to Kevin. Please note the use of all lower case charactures. We are looking at ways of using the Internet for the benefit of our readers. However please do not expect to be able to read *SWM* over the 'net for nothing!

LISTENING TO

THE MAGNETIC LONGWIRE BALUN
Successful Listening Starts Here . . .

All the experts agree – the secret of successful listening starts at the antenna. Skimp on the antenna and you might as well not bother! For years many of us struggled with longwires and a.t.u.s, getting increasingly frustrated at the growing level of interference generated by household wiring and appliances. Then along came the MLB – half the price of my a.t.u., but promising to do twice as much – match my longwire to 50 Ohms *AND* cure my interference problem. So, I tried one – a week later my three a.t.u.s were up for sale – most of the domestic interference gone and fewer knobs to twiddle!

The MLB has made a real difference to my listening – and to the hundreds of customers I've recommended them to since. The MLB is exceptional value at £45, and correctly installed I'm sure it will make a difference to yours.

Just available is the MLB ISOLATOR. When used in conjunction with the MLB, this new addition to the range will provide you with a convenient terminal to attach an earth wire and totally isolate the earth connection of the aerial from the earth connection between the mains supply and the receiver – another hiding place for noise.

Ring today for full information on these and other interesting products that we know will help you to get more out of your listening!

DSP Noise Reduction Products From JPS Communications!

JPS Communications specialises in low cost ***Digital Signal Processors*** - the hi-tech way to filter out noise and heterodynes and what's more, they'll work with anything from your home-brewed short wave receiver to the latest all-singing, all-dancing receivers and scanners on any band you care to mention!

NIR10

Noise/interference reduction unit.

The NIR10 allows reception of difficult to read signals. NIR mode helps to reduce or even eliminate heterodynes, white or ignition noise, RTTY interference and power line noise. PEAK function reduces white noise interference. NOTCH FILTER mode removes multiple heterodynes and acts in 3 milliseconds! BANDPASS mode has a continuously adjustable centre frequency.

Just £399 .....*Carriage £10.*

NTR1

Wide band noise and tone remover.

The NTR1 provides wideband operation for AM or FM reception and narrow band operation for SSB, CW or Data reception. State-of-the-art DSP rapidly removes multiple tones.

Just £199 .....*Carriage £10.*

All JPS DSP filters require a 12V power supply to run from the mains but it needs to be fairly beefy. Run it from your shack supply or from our dedicated 1Amp PSU available at ***£29.95.***

INTERNET ADDRESS:
orders@lowe.demon.co.uk
info@lowe.demon.co.uk

BERKSHIRE
3 Weavers Walk
Northbrook Street
Newbury
Tel: (01635) 522122

NORTH EAST
Mitford House
Newcastle Int. Airport
Newcastle Upon Tyne
Tel: (01661) 860418

WALES & WEST
79/81 Gloucester Rd
Patchway
Bristol
Tel: 0117-931 5263

LOWE

Lo
Chesterfield Roa

THE WORLD

AIRBAND *is going* DIGITAL

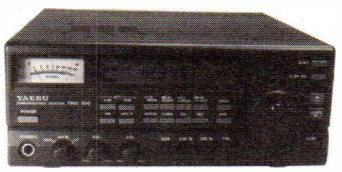
Over the next few years, more and more aircraft will be fitted with ACARS. The simplest and cheapest way of listening in on the action is by using the new

LOWE AIRMASTER

in conjunction with your existing airband receiver and a personal computer.
Airmaster consists of a small demodulator that goes between a VHF airband radio and your computer, plus a software disk and full documentation.

Price £89.95

FRG-100
£549



NRD-535
£1549

Jump start your frog!

If there's one thing we are really good at it is listening to our customers, particularly those who have purchased products and then haven't been really satisfied. There's been more than a few who have purchased the FRG-100 to be disappointed by the performance of its filters so we are going to change that right now!
We'll soon be able to offer you an upgrade service for the FRG-100 that will completely transform its performance. We'll be able to change its AM filters to improve reception of broadcast stations making the receiver infinitely more suited to BCB DXing and of course just plain old listening.
If you would like more details, just drop us a line asking for "FRG-100 UPGRADES" and we'll show you how to jump start your frog. If you enclose 4 first class stamps, we'll send you our complete shortwave information pack as well.
Having given you the good news, here is some not so good! From the 1st March we are reluctantly having to increase the prices of some of our receiver products.

New prices are as follows:

HF150	Shortwave receiver	**£419.00**
HF150M	Marine receiver	**£439.00**
AK150	Accessory kit	**£39.95**
BL150	Backlight kit	**£39.95**
C150	Carry case	**£39.95**
IF150	Computer interface	**£44.95**
KPAD1	Keypad controller	**£44.95**
MB150	Mobile mount	**£39.00**
MPW	Telescopic whip	**£11.95**
RK150	Two tier rack	**£59.95**
RK150E	Rack extension	**£19.95**
AP150	Audio processor	**£219.00**
PR150	Preselector	**£235.00**
WM	Wirematch antenna	**£89.00**
XLS1	Extension speaker	**£59.00**
HF225	Shortwave receiver	**£499.00**
HF225 EUROPA	Deluxe shortwave receiver	**£699.00**
B225	Battery pack	**£69.00**
C225	Carry case	**£34.95**
D225	AM sync detector	**£49.00**
W225	Whip and pre-amp	**£35.00**

This is our first price increase for over TWO YEARS so I hope we'll be forgiven! Next month, we should have some terrific news for the serious Airband listener – watch this space!

SOUTH EAST
Communications Hse.
Chatham Road
Sandling, Maidstone
Tel: (01622) 692773

YORKSHIRE
34 New Briggate
Leeds
North Yorkshire
Tel: 0113-245 2657

SOUTH WEST
117 Beaumont Road
St. Judes
Plymouth
Tel: (01752) 257224

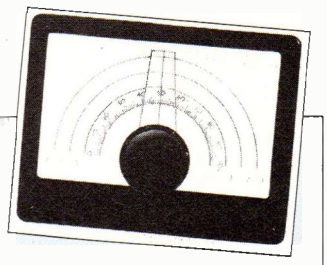
EAST ANGLIA
152 High Street
Chesterton
Cambridge
Tel: (01223) 311230

we Electronics

l, Matlock, Derbyshire DE4 5LE Tel: (01629) 580800 Fax: (01629) 580020

New Products

This month's round-up of new products, books and catalogues.



Leather for AR8000

Javiation have just launched a robust, real leather case for the AR8000. The case features a slot to allow the user's belt to be threaded through the back. This allows secure waist height operation of the radio. The case also facilitates use of the radio's belt clip of wrist strap.

The front panel is open to allow access to the keys and display, a version is planned with a screen to protect these areas. Price is anticipated to be about **£15** including VAT. For more information contact: **Javiation, Carlton Works, Carlton Street, Bradford, West Yorkshire BD7 1DA. Tel: (01274) 732146. Fax: (01274) 722627.** Or Internet **clough@javiaton.demon.co.uk for e-mail.**

Old Favourite Returns

Isoplethics, newly appointed distributor for Jackson Bros variable capacitors, announce the renewed availability of the 6/36 slow motion drive and dial assembly. (Cat. No. 4103/A). The drive assembly measures 123 x 95mm overall, and features a dual ratio (6:1 and 36:1) ball drive. The black plastics-coated escutcheon covers the printed card scale. A 0-100 logging scale is provided on the inner position, leaving three 180° blank scales for calibration by the user.

The drive is ideal for the home constructor to use in projects such as direct-conversion receivers, v.f.o.s, wavemeters, etc. The 6/36 assembly is available from Isoplethics in the UK and the EEC for £19.50, including P&P and VAT. For more details contact: **Isoplethics, 13 Greenway Close, North Walsham, Norfolk NR28 0DE.**

BARTG Multyterm Passes EEC - EMC Tests

The British Amateur Radio Teledata Group, BARTG are pleased to announce that their acclaimed multi-function data terminal unit has recently passed the rigorous EMC testing in compliance with standard EN 580082-1:1993. The 'New Improved Multyterm' underwent testing at the York Electronics Centre at the University of York. It was tested for radiated immunity, immunity to electro-static discharge and immunity to electrical fast transient bursts.

BARTG is an **amateur** radio club and is believed to be the first to have obtained compliance to the EEC EMC standard, which applies to residential environment. The Multyterm is available from £59.00 plus £2.50 P&P. For further details contact: **Ken Godwin, 11 St. Lukes Way, Allhallows, Kent ME3 9PR. Tel: (01634) 27154.**

Antenna Noise Canceller

DSP filters that operate on the receiver's audio output have been around for some time. Now JPS announce a new product the ANC-4 which is a device which provides noise cancellation at the antenna end. The unit connects between the antenna and the receiver or transceiver (up to 150W pep). This is to cancel locally generated noise from sources such as power lines, computers, TVs or close by machinery, before it gets into the receiver and effects the receiver's a.g.c. circuitry.

The unit has an r.f. detector built-in which automatically bypasses the network when used in conjunction with a transmitter. The ANC-4 operation principal is that local noise is received by a telescopic or short wire, 'noise' antenna, this signal is then subtracted from the main antenna input providing a 'clean' signal to the receiver antenna input. The ANC-4 may also be used as an active antenna. Priced at around £189 the unit is available from: **Lowe Electronics, Chesterfield Road, Matlock, Derbysire DE4 5LE, DE4 5LE. Tel: (01629) 580800 Fax: (01629) 580020.**

SWA-30

A brand new product from Haydon Communications should prove indispensable to those with no possibilities of having an external antenna. The SWA-30 features two 1m telescopic elements connected to the receiver input via a 'magnetic balun' arrangement. The antenna is supplied with a 1m length of coaxial cable terminated at the receiver end with a PL259 plug. The antenna has four suckers fitted to its base which allow either desk-top or window mounting. The SWA-30 costs £44.95 plus P&P of £4.00. It is available from **Haydon Communications, 132 High Street, Edgeware, Middlesex HA8 7EL. Tel: 0181-951 5781/2.**

Drop a line to Kevin with all your new product details. Post, Fax or E-mail accepted.

Scancat and Scanstar

Two new computer control packages on offer by Javiation for the AOR AR8000. *ScanCat* from J & J Enterprises also supports a wide range of other receivers and scanners. The software is DOS based and requires at least 640Kb of RAM, one serial port and a colour graphics card.

The *Scan*Star Commercial* package is produced by Signal Intelligence and is similar to the *ScanCat* product, it does, however require a minimum of a VGA monitor and DOS version 5 or OS/2 v2.1. Facilities are provided for the modification of the AR8000 band plan. A full review of both of these products and lots of others will be featured in the July issue of *SWM*. Javiation can be contacted at: **Javiation, Carlton Works, Carlton Street, Bradford, West Yorkshire BD7 1DA. Tel: (01274) 732146. Fax: (01274) 722627.** Or Internet **clough@javiaton.demon.co.uk** for e-mail.

Scanmaster

Airband enthusiasts take note. Nevada Communications have recently launched a professional grade Airband base antenna, the Scanmaster SBA 100. The antenna has been designed and is manufactured primarily for commercial use. It will withstand the worst weather and atmospheric conditions. This broad band antenna is vertically polarised and is suitable for both reception and transmission over a 28MHz band width in the commercial aeronautical band. It will handle power levels of up to 1kW over the entire frequency range, with a v.s.w.r. of less than 1.5:1. The earthed radial system increases efficiency and allows for maximum possible range. For further details contact: **Nevada Communications. 189 London Road, North End, Portsmouth, Hants. PO2 9AE. Tel: (01705) 662145, Fax: (01705) 690626.**

Scanning Secrets

The mysteries of monitoring explained. Advice on buying and operating your scanner. Where to listen and how to gather obscure frequencies. The myths and folklore exposed. All the information needed to unlock the potential of your scanner. Features 280 pages, costs **£16.95** plus P&P and is available from the ***SWM* Book Service.** Order form is on page 91 of this issue.

'HAM'STER'™

The Ultimate Transmitting Accessory?

This review came about by sheer chance. Bill Wilson was visiting Japan recently to purchase a couple of IC-R9000s (one for spares, of course). He was introduced to the President of Fony Electric Industries Co Ltd. who more or less insisted that he should have a sneak preview of the Ham'ster™, the latest addition to his company's expanding range of ham products.

Although purely for the licensed (or about to be licensed, or, indeed, pirate) amateur, it will probably be of interest to every s.w.l. aspiring to a licence, as this review may well explain some of the rather more interesting transmissions likely to be heard once the Ham'ster hits the market.

But first a word of explanation. Recent correspondence in our sister magazine *Practical Wireless* has drawn attention to the sad fact that many 'established' amateurs tend to be intolerant of novices and the newly licenced, whose transmissions with home-made or second-user gear, let's face it, are not always of the high technical standard that the rest of us feel we must maintain. We must all have, at some time or another, come across on the amateur bands, sad little nets comprising newcomers or novices with their rather pathetic gear, made from junk sale bits and pieces, who are mainly ignored by the rest of us.

What is generally not recognised is that the converse of this attitude quite often applies, that is that some of these newcomers will not willingly reply to CQs put out by obvious owners of top-of-the-range black boxes. Whether this is through envy, fear of ridicule, or just plain shyness, is not clear.

With the advent of the Ham'ster™, all this will change! With the Ham'ster, you will be guaranteed a reply to every call!

The HAM'STER

The basic Ham'ster is a small unit which will plug into the RS232 interface socket on the rear of your up-market transceiver. When the unit is in use, the transceiver can be programmed at will to simulate the characteristics of almost any kind of home-made or crudely modified ex-WD transmitter and thereby guarantee the operator a reply to a CQ or gain access to any net with complete confidence. For example, fire up your transceiver on Top Band, add 60Hz hum as well as a rapid very deep fades (about 5Hz) to your CQ and await the pileup of calls from W-expectant Gs!

Or, under the 'Tin Shack menu', add to your transmission the sound of kids screaming, dishes clattering and the odd dog barking in the background and some poor op will certainly take pity on you and reply.

The basic Ham'ster is shown in the heading photograph of one of the prototypes, the push buttons selecting the most commonly used effects. However, each button accesses its own set of nine effects available from each of the 'Menu' and 'Depth' controls and which are displayed on the l.c.d. display. A 3.5mm socket on the front panel permits earphone monitoring of the chosen effect .

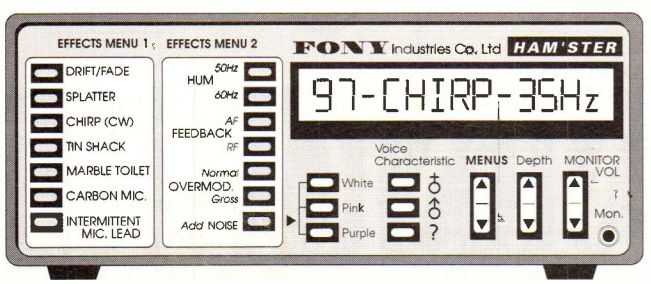
These selections of effects range from moonbounce type flutter which will be irresistable to e.m.e. devotees, to CB type overmodulation complete with an 80dB diesel motor noise almost killing the speech, a sure bait for operators who have recently come to amateur radio from the ranks of the Breakers. (/P can be automatically added to your callsign under this mode).

And what about getting attention by setting your v.f.o. a shade outside the band edge, selecting the 'Splatter' menu to extend the sidebands of your signal about 50kHz into the band. This, with gross keyclicks superimposed, is a sure attention grabber. Don't use the 'Spark' option, there are very few folk around who would recognise it anyway.

With the Ham'ster there could be grounds for confusion if your contact is **also** employing Ham'ster. You won't know who's kidding who — and any QSO could quickly degenerate into a battle of wits! But be assured, with 'Hams'ter', no Ham will be able to disregard your call!

The big drawback with the prototypes is that the range of effects is severely limited by the solid state memory for the speech and sound synthesiser chips in the unit. But wait! the "Super Ham'ster" is in the development stage. This model will interface with both your rig and your PC, and with the CD ROM that will be supplied with the "Super Ham'ster", will allow literally thousands of effects to be accessed.

First deliveries of the Ham'ster are promised for the beginning of April. ■



HAM'STER Mk III

YOU DECIDE - WE PROV

AOR The Ultimate range!

AR-8000

The ultimate H/held scanner.
0.5–1.8GHz all mode.
(Incl's Nicads/Charger/PSU etc).

~~£425~~

OUR PRICE **£389**

WHY NOT PART-EXCHANGE YOUR OLD AOR HAND HELD OR ANY OTHER SCANNER YOU MAY HAVE AND MOVE INTO THE 21st CENTURY. WE GUARANTEE BEST PART EXCHANGE DEALS AROUND

The latest star from AOR.

THE NEW AR-2700

.5–1300MHz with optional voice record

£PHONE

NETSET PRO-44

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

~~£149.95~~ OUR PRICE **£114.95**

ALSO STOCKED PRO-43 – Covers 66-88/118-174/220-512/806-999MHz

~~£249.95~~ OUR PRICE

Nicads/Charger/PSU for the above only £15.99

£199.95

STAR BUY!

ALINCO DJ-X1D

The perfect pocket scanner

~~£299~~ **£249**

(.1-1300 MHz)
(Incl's Nicads/Charger)

LIMITED STOCKS

PRO-2035

1000 memory base station scanning receiver. with Hyperscan
Covers 25-520/760-1300MHz.

~~£349~~ OUR PRICE **£279** LIMITED OFFER

PRO-2039

200 channel base station scanning receiver with Hyperscan.
Covers 66-88/108-174/380-512/806-960MHz.

INTRODUCTORY OFFER PRICE **£199.95** (internal power supply)

AR-3000A

The ultimate desk top communication receiver.
Covers 100kHz–2036MHz (all mode).

~~£949~~ OUR PRICE **£839**

OTHER EASTER SPECIALS INCLUDE

AR-3000A PLUS	~~£949~~	**£899**
AR-SDU-5000	~~£699~~	**£649**

YUPITERU'S LARGEST UK STOCKIST

MVT-7100	~~£389~~	**£PHONE**
MVT-7000	~~£289~~	**£265**
MVT-225	~~£249~~	**£225**
MVT-125	~~£189~~	**£169**

Yupiteru MVT-8000

Still UK's number one low priced desk top 8-1300 MHz scanner.

~~£449~~ SALE PRICE

£335 Includes PSU

NEW UK SCANNING DIRECTORY 4th Edition

Packed with frequencies.
From 25 to 1300MHz.

£17.50 INCLUDING FREE P&P

THE ONLY SERIOUS GUIDE.

SCAN BUSTERS

How to tune into more frequencies and beat new technology.

ONLY

£4.95

+ £1.00 P&P

OPT-3300

The latest mini freq. finder from Optoelectronics (smaller than a packet of cigarettes.) Inc. NiCads/Charger/Ant. (1MHz–2.8GHz) ~~£169.95~~

£139.95 P&P £5

SCANNING ACCESSORIES

P&P £1 on any of the following:

OP-51	Case (7100)	**£17.95**
OP-50	Case (7000)	**£17.95**
CA-8000	Case (8000)	**£17.95**
CA-7200	Case for PRO 43/44	**£14.99**
QS-200	Air vent mount H/helds	**£9.99**
QS-300	Desk mount H/helds	**£19.99**
NE-1023	Scanner ant (rubber)	**£8.99**
NE-1012	Scanner ant (black telescopic)	**£9.99**
TSC-2602	Scanner ant (rubber)	**£22.95**
ABF-125	AOR airband filter	**£24.50**
S.W.F.H.	S.W. guide lists everything from 0-30MHz	**£12.95**
L.W.K.	Long wire kit N.B. p&p £3	**£24.95**
SP-55	Scanner Pre-Amp	**£74.95**
PA-600	Pre-Amp + speaker	**£29.95**
HS-5	Kenwood deluxe H/phones	**£49.95**
HS-6	Kenwood lightweight H/phones	**£32.95**

GET MORE OUT OF YOUR SCANNER WITH ONE OF THESE SUPERB ANTENNAS

BSS-1300

Double nest of dipoles. The ultimate base antenna! Receives 10–1300MHz. Supplied with 10m coaxial lead and BNC plug fitted. 34" high, loft or outdoor mounting use a flat wall or pole mount.

£69.95

Delivery £7

NB. ANTENNA MOUNTS VERTICALLY

DSS-1300

Low profile desk top nest of dipoles receives 10–1300MHz. Supplied with coaxial cable and BNC plug fitted.

£44.95

Delivery £3

MSS-1300

Car magnetic mount version of the DSS-1300. (BNC plug and coaxial cable supplied).

£44.95

Delivery £3

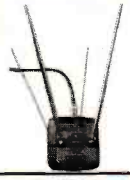
REVIEWED SHORTWAVE MAGAZINE DECEMBER 1994

HAYDON COMMUNICATIONS

WARNING!! Not all advertisers in this magazine are authorised stockists for the products they sell. Manufacturers advise customers to purchase from authorised dealers to ensure full company guarantee back up. HAYDON COMMUNICATIONS sell only brand new factory sealed stock direct from the manufacturers & are authorised for all its brands.

IDE. CALL 0181-951 5781/2

★ STOP PRESS ★ STOP PRESS ★ STOP PRESS ★ STOP PRESS ★



NEW SWA-30 At last we've solved the problem! No more upsets with the neighbours or the other half! No more strange things sprouting from the chimmey or stretching down the garden. Yes, it's a self contained passive (non-powered) desk or wall mount shortwave antenna. (0-30MHz) and don't forget – you will not have to go out and spend £45 on a magnetic balun – it's got one fitted. All this for **£44.95** – how did we do it – with great difficulty. p&p £4.00

Sangean ATS-803A

Our best selling low priced portable short wave receiver. All modes including s.s.b. ~~£129~~. **£119.95**

£5 delivery

MBR-8

This low priced short wave receiver is a must for the beginner. So full of facilities that we don't have space to list them all here. Will also receive airband/marine & PSB's.

£64.95 DELIVERY £6

PORTABLE SHORTWAVE

NEW SONY SW-7600G

With synch AM. 0.15–30MHz all mode.

~~£179.95~~ OUR PRICE **£159.95**

ALSO STOCKED

SONY SW-100	~~£199~~	£179.99
SONY PRO-80	~~£349~~	£299.99
SONY SW-77	~~£399~~	£349.99
RC-818 S/W + cassette	~~£219~~	£199.00
RC-817 S/W portable	~~£189~~	£169.00

WHY NOT PART-EX YOUR OLD PORTABLE FOR ONE OF THE ABOVE?

☆ The Yaesu Challenge ☆

FRG-100

UK's best selling short wave receiver. ~~£559~~

OUR PRICE **£449**

FREE THIS MONTH WITH FRG-100 WE ARE GIVING AWAY A SWA-30 SHORT WAVE ANTENNA

*Bring your old Yaesu or Lowe receiver in and put it to the test. Compare it to a receiver that not only looks like a receiver but works like nothing you've had before. We'll even take your old receiver in Px – **Top prices paid.***

AOR-3030

Superb quality communication receiver. Covers 300kHz–30MHz.

~~£699~~ OUR PRICE **£639**

KENWOOD R-5000

Top range communication receiver. Covers 100kHz–30MHZ.

~~£999.95~~ OUR PRICE **£869.95**

ANTENNA TUNNING UNITS

HOWE CTU-8

Ready built! Ready to go! 0.5–30MHz. Improve your SW receiver with this little beauty.

£49.95 + free del

ALSO STOCKED

GLOBAL AT-2000	Our price	£95
CTU-8	Kit	£29.95

DIGITAL AUDIO FILTERS TIMEWAVE DSP-9 PLUS

The ultimate digital noise filter. Previously reviewed with top rating.

**** OUR PRICE **£229.95**

ALSO STOCKED

DATONG FL-3	~~£149.95~~	£139.95
MFJ-784	~~£249~~	£239.95

NEW AT-100

Active antenna + preselector. Superb indoor antenna/tuner. (300kHz–30MHz) Batt's supplied.

Opitional **£79.95** *FREE P&P*

(AC PSU £7.95)

UK's LARGEST STOCKIST OF SECONDHAND EQUIPMENT

AOR 3030

Communication receiver.

As new...**£599**

E.R.A.	Display unit	£179
E.R.A.	Micro Reader	£129
PRO-2032	As new	£189
AR-2800	All Mode	£339
AR-2500	All Mode	£329
MS-1000	As new	£219
AR-950	As new	£149
PRO-2005	As new	£199
AR-3000A	As new	£799

YAESU FRG-100

Communication receiver.

Ex demo **£399**

R-72	Ex Demo	£849
R-70	VGC	£449
NRD-525	As new	£729
R-817	Roberts port	£149
SW1-E	As new	£119
SW-22	As new	£49
SW-7600	Ex demo	£139
SW-77	As new	£299
RFB-45	VGC	£119
PRO-43	VGC	£179

LOWE HF-225

Short Wave Receiver

As new.....**£399**

MVT-7100	As new	£299
MVT-225	VGC	£199
ICOM R-1	As new	£249
ATS-803A	As new	£89
OPT-2810	Freq finder	£129
SONY AIR-7	As new	£169
HP-1000	As new	£199
R-5000	As new	£849
FL-2	Audio filter VGC	£89
FRG-7	VGC	£189

NOTE: ALL ABOVE FULLY GUARANTEED:- EX DEMO – 12 MONTHS/SECONDHAND – 3 MONTHS

NB: ALL PRICES INCLUDE VAT

★ Outside office hours **01850 586313** ★ Mail Order: Same Day Despatch ★

Sales/service:– (Phone/Fax) – **0181-951 5781/2**

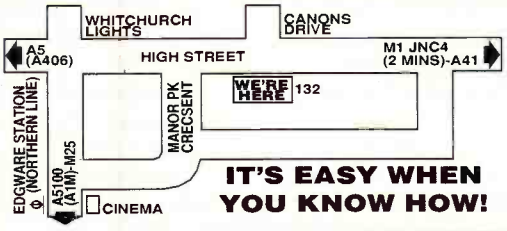
132 High Street, Edgware, Middlesex HA8 7EL

Close to Edgware underground station (Northern Line). Close to M1, M25, A406.

★ FREE PARKING ★

★ OPEN:– ★ MON-SAT 10-6PM

DELIVERY (UK MAINLAND) 24HR £10 / 48hr £7.50



Aircraft Communications

Philip Mitchell looks at the development of aircraft radio communications

Described in the USA at the time as 'another chapter in aerial achievement' on August 27 1910, Frederick 'Casey' Baldwin and J. A. D. McCurdy exchanged Morse radio messages between an aircraft in flight and ground. From a Morse key attached to the steering wheel of a Curtis biplane, McCurdy tapped out this first airborne radio message, to be received and recorded by Baldwin on the ground.

The Birth of ATC

It was not until 1933 that any serious attempt was made to develop radio equipment for an effective air navigation and control system that was becoming essential for the management and safety of the increasing numbers of commercial aircraft. This was the Radio Range system first installed along Europe's busiest air route, then Le Bouget, Abbeville, Lymne (Kent) to London (Croydon).

Lorenz, a similar German development, and a forerunner of today's instrument landing system, (ILS) was used at the same time to provide guidance beams for aircraft landing in bad weather. Both systems relied on the reception in the aircraft of two narrow c.w. parallel transmission beams, transmitted from beacons 160 km apart, one coded 'A' (.-) the other 'N' (-.).

Where the two beams overlapped in the centre, a continuous tone was received. This enabled the pilot to maintain an accurate course between these beams along the air routes.

It has been during the last 50 years, however, that technology in aircraft communications equipment has been almost revolutionary and it is probable that without the development of transistors, microcomputers, solid state devices and synthesised receivers, the present high standard of air traffic control would not be possible.

Rapid Developments

During the Second World War, because of the enormous number of warplanes in the air, great progress was made in aircraft communications. It was the time of the introduction into UK military aircraft in 1941 of h.f. sets such as the T1154 and R1155 (see August 1993 edition of *Short Wave Magazine*).

In 1943, a four channel crystal controlled v.h.f. transmitter receiver (the TR1143) entered the service which paved the way to the development of present day airborne transceivers. Quite apart from the complex Electronic Flight Instrument System in modern aircraft, associated non-R/T equipment has also been installed in such aircraft avionics and various navigation flight aids, automatic direction finder, (currently in use but being phased out), Doppler, Decca and Inertial Navigation System, Transponder and the new Microwave Landing System, etc., to name just a few!

All these are now considered essential items to be fitted on the flight deck. This has meant that, since space is limited, the development of smaller communication units is of paramount importance.

Cockpit of a modern helicopter. The radio equipment is just below the pilot's hand, with an illuminated frequency indicator panel. This could be v.h.f. or in the case of a millitary aircraft u.h.f. *Photo courtesy of Racal Electronics*

The VHF/NAV/COM Set

On some light aircraft and a few commercial airliners, the v.h.f. transceiver covering the current 760 channels from 108 to 136.975MHz at 12.5kHz spacing is combined with the navigation receiver, the latter being used for the reception of coded signals from non-R/T radio sources.

These are the v.h.f. Omni-Directional Range (VOR) and Distance Measuring Beacons (normally installed together on the ground), the Non-Directional Beacons (NDB) and the Instrument Landing System (ILS). All these signals can be received independently of the communications receiver and conversely radio communication operations can be conducted simultaneously with the reception of various navigation aids signals.

A basic front panel arrangement of a typical Bendix NAV/COM set and its two co-related parts is shown in **Fig. 1.** The independent volume controls enable VOR, DME and ILS signals to be adjusted to the correct level whilst still retaining R/T contact with the ground.

The v.h.f. and h.f. operating panels in current use on Boeing 737/300 passenger aircraft can be seen in **Fig. 2.** For ease of

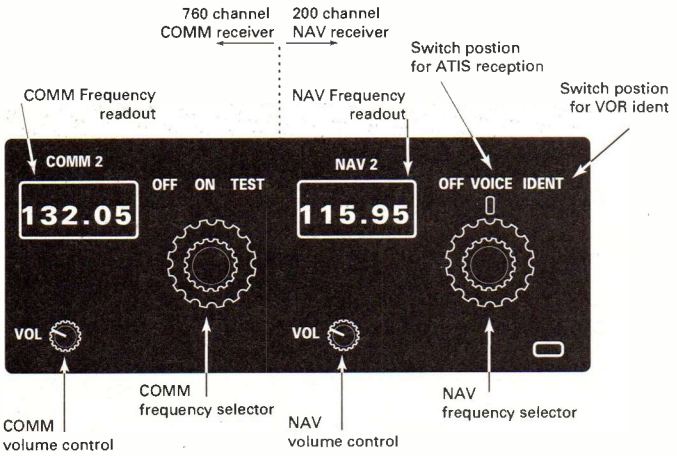


Fig. 1: Basic combined NAV/COM aircraft radio set.

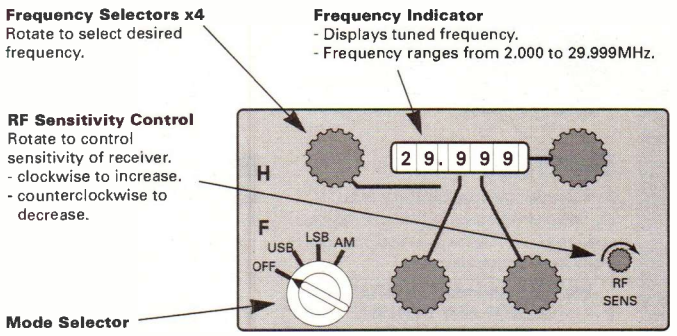
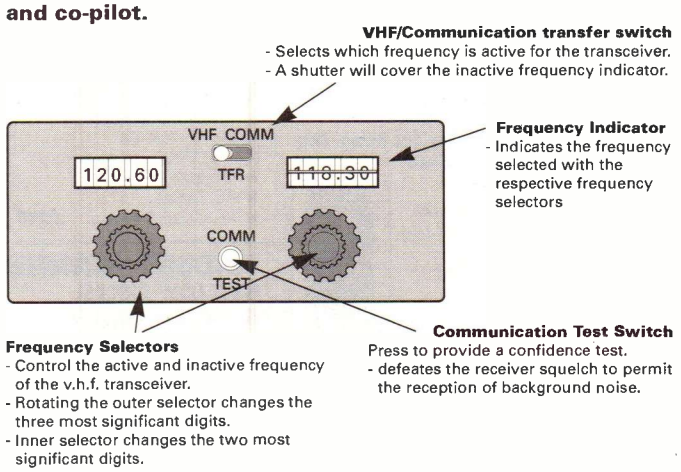


Fig. 2: Panels for v.h.f. and h.f. operating as currently used on BOEING 737/300 commercial passenger aircraft. These are fitted in the aft electronics panel between pilot and co-pilot.



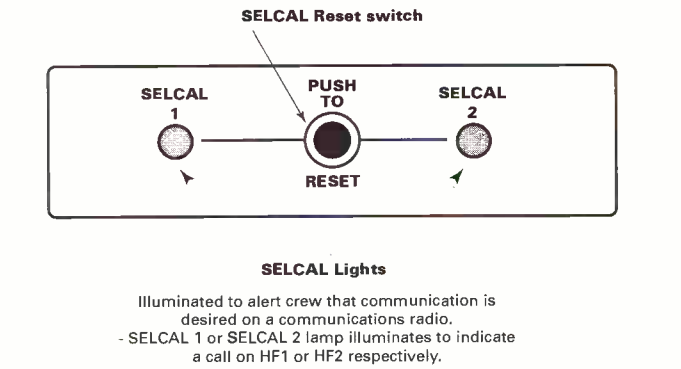


Fig. 2a: Selective Calling (SELCAL) visual warning as fitted in the forward electronic panel of BOING 737/300.

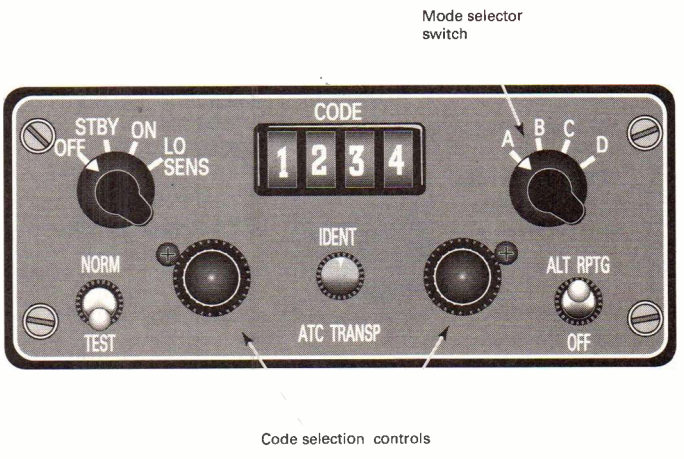


Fig. 3: Collins 621a ATC Transponder.

operating, these are fitted along with the transponder and ADF navigation panels between captain/pilot and co-pilot, both of whom can operate the v.h.f. and Automatic Direction Finder (Navaid) equipment independently. However, the v.h.f. transceivers and Navaid sets are separate units in the Boeing 737 units.

HF Transceivers

For commercial aircraft flying beyond domestic air traffic routes, i.e. oceanic routes and across areas where no land-based ATC exists, the installation of h.f. equipment is mandatory. In the case of the transoceanic flights outside the range of radar and where normal investigation aids such as VOR cannot be used as with v.h.f. operations. Other equipment must be installed such as an Inertial Navigation Systems and, looking ahead, the Global Navigational System to enable precise position of aircraft to be ascertained.

The h.f. transceiver operating panel is also shown in **Fig. 2** and can normally be operated by both the captain/pilot sitting in the left hand seat and the co-pilot sitting in the right hand seat of the cockpit.

Transceiver operations, (both h.f. and v.h.f.) are simplified as much as possible, eg. auto-selection of filters, automatic squelch control, the latter can be removed by pressing the communication test switch to verify receiver operation if needed.

Selective Calling (SELCAL)

To eliminate the need to maintain a constant radio watch for messages from ATC ground control as in the case on lengthy transoceanic flights, the transmission of a four letter SELCAL identification code will activate the h.f. receiver and relay to the flight deck an audible two tone signal. A visual signal in the form of a flashing light is also incorporated in the forward electronic panel on the flight deck as shown in **Fig. 2a**.

ATC Transponder (Secondary Radar)

Although operating on radar band frequencies, mention will be made of the aircraft transponder equipment since it is frequently used as essential part of R/T Air Traffic Control operations. In simple terms, it enables ground controllers to make a positive identification of aircraft under their control.

The equipment is triggered by a ground radar

Continued on Page 20

NEVADA

YUPITERU

As Yupiteru's authorised distributor in the UK, we stock their full range including accessories and spares. All Yupiteru is in stock now and ready for immediate despatch.

WE WILL, WITHOUT HESITATION, MATCH ANY GENUINE ADVERTISED PRICE.

Call us now – we guarantee you won't be disappointed!

MVT-7100...With SSB.....£Call
MVT-7000...Standard Model.....£Call
MVT-8000...Mobile, with PSU.....£369
VT-225.....Civil/Military Airband.....£249
VT-125.....Civil Airband.....£189

AOR SCANNERS

In Stock Now Ready For Same Day Despatch!

AR2700 - NEW

Why not Part Exchange your old handheld or pay by 3 post dated cheques for this new handheld that has optional
★ Voice Recording
★ Computer Control
★ Data Clone
Price.....**£269**

AR2700 - VC

AR2700 fitted with Voice Rec. Chip.
Price.....**£299**

AR8000 - NEW

Why not pay by three past dated cheques for this new scanner from AOR. See bottom right hand panel for full details. Alternatively part exchange your old scanner.
★ 500 KHz to 1900 MHz
★ 1000 memory channels
★ Many new features
Price.....**£399**

AR 8000 SOFT CASE

Protect your AR 8000 with this original soft protective case.....£17.95

AR3000A

Full coverage from 100KHz–2036MHz with a host of features including RS232 Interface for computer control. USB, LSB, CW, AM, FM and WFM modes.

Now available from stock at only £899 – £50 off list price!

SCS SOFTWARE For AR300A computer control, Logging system, Spectrum display, Freq data base etc.....**£59.95**
Demo disk available.....**£1.50** inc. P&P

AR1500EX H\Held, 1000 Channel Memory 500 KHz - 1300 MHz. with SSB.....£349

NEVADA MS1000

Our own superb base scanner with many features.
★ 500 KHz - 1300 MHz (with gaps)
★ 1000 Memories
★ Auto Tape Switch
★ Audio Squelch.....**£299**

BEARCAT

BEARCAT 220XLT

★ A new handheld scanner covering right up into the high 900MHz bands.
★ Ideal – Airband, PMR, Amateur and Marine Bands
★ Includes Mains charger
.....SPECIAL OFFER **£199**

BEARCAT 65XLT

A very simply to use budget handheld. 10 memory channels: An ideal beginners model!
★ Freq.range 66-88,137-174,406 - 512 MHz.....**£99.95**

BEARCAT 2500XLT

New redesigned case 400 programmable memories, wideband coverage (25-1.36GHz)
★ Auto Store
★ VFO Control
★ Inc. Nicads & charge.....**£299**

TRIDENT SCANNERS

NEW LOW PRICES!

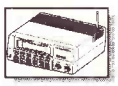
TR980 -A compact full featured H/Held with continuous coverage. Ideal for Civil & Military Airband plus all other services!

★ 5 to 1300 MHz
★ 125 Memories
★ AM/FM/Wide FM
★ Delay/Hold
★ Triple Conversion RX
Special Price
(Less Nicads/Charger).....**£199.95**
(Takes 4 AA Batteries)
Special Price
(Inc Nicads/Charger).....**£209.95**

TR2400 -Top of the range with Ultra Wide Coverage and all mode reception including SSB

★ 100 KHz -2060 MHz
★ 1000 memories
★ AM/FM/WFM/SSB
★ Fast Scan
★ Includes Nicad & Charger
Special Price.....**£349**

NEW - REALISTIC PRO 2039



A new base scanner from realistic with hyperscan.
★ 68 - 960 MHz (with gaps)
★ 200 memories
★ Fast Scan/Search
Special Price.....**£189.95**

NICAD BATTERIES

UNIDEN
BP205 Slide on Bat. Pack 100/200XLT..£29.95
BP220 Bat. only 220XLT.....£19.95
BP200 Bat. only 100/200XLT.....£19.95
BP2500 Slide on Bat. Pack 2500XLT.....£29.95

SINGLE NICADS
AA 1.2V 500 mAH Nicad Cells.....£1.25
AA 1.2V 620 mAH Nicad Cells.....£1.45

SKY SCAN DESK TOP

A wide band antenna for use at home. Covers 25 - 1300 MHz c/w base, coax & BNC connector. Height 36". Can be used on your car when static.....**£49.00**

SCANMASTER® - HIGH QUALITY ACCESSORIES

SCANMASTER BASE ANT.

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

SCANMASTER DISCONE

A Quality wideband stainless steel discone. Range 25-1300 MHz with N'Type connector. Transmits on 2m, 70cms.....**£49.95**

SCANMASTER DOUBLE DISCONE

A high performance wideband antenna offering gain over a convential discone. Stainless steel construction with mounting kit and short pole.
★ 25-1300MHz
★Wide TX range.....**£59.95**

SCANMASTER MOBILE

A Complete, ready-to-go magnetic mount wideband antenna.
★ 100-1000MHz
★ Fitted cable & BNC Connector.....**£29.95**

SCANMASTER ON GLASS

Discreet but effective wide band mobile antenna 25-1300 MHz supplied with cable/BNC connector.
Price.....**£29.95**. p&p£2.75

SCANMASTER MOBILE MOUNT

Mounts on air vent grills on the car dashboard. Allows easy and safe operation of most handhelds.....**£9.95**

NOMAD PORTABLE RECEIVING ANTENNA

The NOMAD is a fully portable flexible wire scanning receiving antenna. Covering both VHF & UHF it's compatible with all scanning receivers. Simply suspend it with the cord supplied.
★ Optimised for airband
★ 4M Coaxial Cable
★ Fitted BNC.....**£19.95**

AMPLIFIED SPEAKERS

Boost the output of your scanner with this pair of amplified speakers. Will run off batteries or 6V adaptor (not supplied). Each speaker gives 2.5W audio output.....**£29.50 Pair**

SCANMASTER SP-55

A low noise pre-amplifier with even better performance, improved circuit design & selectable band pass filters to optimise the receiving range of your choice. 25-1500, variable gain & attenuation. Powered from batteries or 12V DC.....**£69.95**

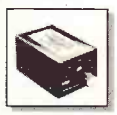
SCANMASTER GW-2

Low noise GaAs FET pre-amp covering 1-1400MHz with variable gain of -3 to +20dB (requires PP3 battery).....**£59.95**

SCANMASTER BASE STAND

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

SCANMASTER NOTCH FILTER



A variable 30dB notch covers 85 to 170 MHz to eliminate music, tones, and voices that break through onto the frequency you are listening to. With low insertion loss the filter can be left in line and helps reduce interference from shortwave broadcasts below 1.7MHz.....**£29.90**..P&P £2.75

AIRBAND FLEXI WHIP

Will give optimum performance on Civil Airband. Length:- 2ft with BNC.....**£13.95**

NEW SCANMASTER AIRBAND BASE ANTENNA MODEL SBA 100

The first in our professional series, this antenna was primarily designed for commercial use where quality of construction, reliability and performance are of utmost importance - however it has been well received by enthusiasts who want the very best airband performance.

★ Designed to commercial standards
★ Suitable for reception & transmission
★ Covers 108 to 136 MHz
★ Transmit up to 1KW
★ 1.05mtrs long
★ S0239 type VHF connector

Introductory Price.....**£59.95**...P&P £4.75

TWO NEW HOT SELLERS!

SCANNER BUSTERS

Overcome new technology and listen in to what you want to hear. 64 pages packed with info on how to get more from your Scanner.Includes first class frequency lists showing where to tune and explains many of the new technologies now in use.....**£4.95**

EAVESDROPPING ON THE BRITISH MILITARY

A fascinating book that tells you how to tune into British Military Communications with ease. With this book and Short Wave or Scanning receiver a secret world will open up providing hours of enjoyment.
Price.....**£17.50**

USE YOUR CREDIT CARDS FOR SAME DAY DESPATCH

ORDER HOTLINES: TEL: (01705) 662145 FAX: (01705) 690626

HUGE STOCKS - FAST DELIVERY - FULL SERVICE BACKUP

. . . Now in our 25th Year . . . Buy With Confidence From NEVADA!

THE VERY BEST RECEIVERS FROM DRAKE USA

DRAKE R8E

★ 100KHz - 30MHz wide coverage
★ Passband tuning
★ Built-in Pre-Amp & Selectable AGC
★ Twin VFO's & Timer Functions
★ Dual Noise Blanker
★ RS232 Interface for Complete Control

The R8E's performance is truly staggering, it has a full compliment of filters; synchronous AM detector; multiple scan facilities; 100 memory channels; plus all mode coverage. Why not part exchange your old receiver for this latest model from the USA, we offer excellent PX deals call our hotline now! **£1195**

DRAKE SW8

★ Short Wave Coverage 500KHz-30MHz
★ VHF Airband (116-136MHz)
★ VHF FM (87-108MHz)
★ AM/FM/SSB
240 V AC adaptor included

A top class portable Short Wave Receiver with VHF airband and FM coverage. Drake have incorporated a quality large front-mounted speaker, direct frequency access keypad, four antenna inputs and complete portability with fitted telescopic whip antenna an optical NiCads. Also included are 70 programmable memories, a dual mode clock timer, synchronous AM detector. **£649**

NOISE KILLERS

DIGITAL AUDIO FILTERS FROM TIMEWAVE TECHNOLOGY USA

New Version 3 Software.

Hear weak signals, reduce noise, eliminate heterodynes and interference with these new Digital Audio filters from Timewave.

TIMEWAVE DSP-9 VER.3

A new version 2 unit giving excellent results on SSB/CW includes noise reduction and AGC **£189**

TIMEWAVE DSP-9 PLUS V.3

My favourite! Covers SSB/CW & PACKET, AMTOR, RTTY, GTOR data modes. Incorporates noise reduction, multiple automatic heterodyne notch filters, AGC preset Easy to use at the touch of a button..... **£239**

TIMEWAVE DSP-59 PLUS V.3

Top of the range multi mode covers same modes as DSP-9 PLUS but has front panel control of filter combinations, over 320 available settings for every situation you may encounter..... **£299**

MASTHEAD SWITCH

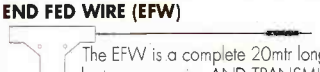
Run 2 Ants from one coax. with this remote M/H switch Good to 1.3 GHz 'N' Connectors **£49.95**

NEW! British Made High Quality Products:- DRAE

LONGWIRE BALUN (DLB)

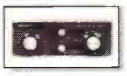
Matches end fed long wires to 50 ohm coaxial cable, helps on receive reduce noise and interference and allows transmit up to 100Watts. Fully moulded for full weather protection. **£39.95**

END FED WIRE (EFW)



The EFW is a complete 20mtr long short wave receive AND TRANSMIT end fed wire antenna. Balun fed to reduce noise and interference pick up. Uses high quality "Flex Weave" copper wire and handles up to 100 Watts RF (with ATU). Covers 1 - 30 MHz **£59.95**

GLOBAL AT2000



New SWL ATU with Q Selector to prevent interference. (100KHz - 30MHz)..... **£96.95**

GLOBAL CX201
Two Way Antenna Switches

Switch your receiver between 2 ant. with this high quality switch.
CX201 PL259 Sockets..... **£18.95**
CX201 'N' Type Sockets..... **£26.95**

AR 3030

A new Shortwave receiver from AOR with full features.
Available from stock for fast delivery.
Save £40 ..... £699 ..... **£659**

Go Portable This Month With Sangean's Latest

The New ATS818 full coverage receiver offers you excellent results without damage to your pocket! An Easy to use direct access keypad & manual tuner make operation a dream! With full Shortwave coverage & VHF Stereo FM. Reception of SBB & CW is easy with the direct B.F.O. tuning

★ Dual time setting & sleep timer
★ Optional Mains P.S.U.
★ 45 Memories
★ External antenna socket
★ Two speed tuning selector
★ Full Shortwave & VHF Stereo FM

SPECIAL OFFER FOR THIS MONTH!
★ Free UK Mainland Delivery
★ Free Drae Shortwave Antenna

Worth £64

£169.95

RECEIVERS

YAESU FRG-100

This is a good rugged receiver ideal for entry into the S/wave scene! 50 kHz - 30 MHz coverage with options for filters & FM Board. 50 mem. for all your favourite frequencies.
SPECIAL OFFER FOR THIS MONTH!
★ Free 12V Supply
★ Free Drae Shortwave Antenna
★ Both Worth Over £69
Price **£499**

KENWOOD R5000

A born champion and competition class receiver! The R5000 will suit Broadcast listening, Amateur Radio & Professional applications. 100 kHz - 30MHz with many options for filters, computer control plus an additional in-board VHF convertor (Cvrs 108 - 174 MHz).
SPECIAL OFFER FOR THIS MONTH!
★ Free Drae Shortwave Antenna
★ Free UK Mainland Delivery
★ Both Worth Over £68
Price **£945**

LOWE

HF-225	Receiver	£479.00
D-225	Synchronous DET	£43.95
HF-150	Receiver	£389.00
HF-150M	Marine Version	£429.00
IF-150	RS232 I/face HF-150	£39.95
PR150	Pre Selector	£199.95
SP150	Spkr c/w filter + meter	£189.00
Key Pad	For Direct Freq. Entry	£39.95

ROBERTS

RC817	Multi band radio	£169.99
RC818	Multi band w/cass	£199.99

SONY

As a Sony Shortwave Centre we carry the full range of Portable Radios -

SW 7600G	Save £20	£159.99
SW100E	Save £20	£179.00
SW55	Save £30	£249.00
SW77	Save £50	£349.00
AN1	Act. Ant.(150 - 30 MHz)	£59.95
AN3	Gen. Purp.Ant	£59.95

ERA MICROREADER

New Version 4.2

Decodes CW,AMTOR, RTTY, SITOR.
Special Offer :- Microreader w/leads, instructions plus free post & packing and also Save £10 ..... ~~£199~~ **£189**

SANGEAN ATS803A

Still our most popular radio. A full coverage Short Wave Receiver with AM, FM & SSB reception. It features excellent sensitivity and filtering – easy push button control and direct BFO tuning for SSB.
Price **£129.95**

NEW FROM OPTO

OPTO 3300

A new miniature H/Held counter - thats very sensitive.
★ 1 MHz - 2.8 GHz
★ 10 Digit LCD Display
★ Hold Switch Locks Display
★ Sensitive
★ Supplied c/w Ant, NiCads & Chargers
Special Offer..... ~~£169.95~~ **£139.95**

OPTO SCOUT

This New mini counters got the lot!
★ 10 MHz - 2.8 GHz
★ 400 Memories
★ Reaction Tune of Receiver (with C1-V Port)
★ Digital Filter & Auto Capture
★ 16 Segment Bargraph for Signal Level
★ Software Supplied For PC Upload
★ Supplied c/w Ant, NiCads & Charger
Special Offer..... ~~£399.95~~ **£369.00**

NEW FOURTH EDITION UK SCANNING DIRECTORY

Now with spiral binder and even more frequencies! - order yours now.
Price: £17.50 POST FREE

VECTRONICS AT100
Active Antenna & Pre-Selector

If you are an apartment or flat dweller you no longer need to suffer poor reception due to antenna restrictions. This new portable active will receive 300 kHz - 30 MHz indoors with the supplied whip/Ext. Ant. **£79.95**

PSU101 MK IV

A combined desk stand and pwr supply/charger for handheld scanners. Suitable for most popular models. Special versions avail. Call for details..... **£29.50**
PSU101TA 9V Version..... **£29.50**

TRADING POST

SCANNING RECEIVERS

AOR AR1500 H/Held	£225.00
AOR AR3000A	£625.00
Bearcat 50XL	£70.00
Goodmans ATS 802 pocket S/W RX	£40.00
Marumhama RT618	£299.00
MS1000 base scanner	£199.00
MVT 3100	£185.00
MVT 6000	£195.00
Realistic Pro 41 H/Held	£75.00
Win 108 Airband VHF	£150.00
Yupiteru MVT-7100 hand-held, boxed	£265.00

SHORTWAVE RECEIVERS

Bearcat DX1000 Very Rare	£295.00
Kenwood R2000 Mint Condition	£375.00
KSangean ATS-803A boxed	£95.00
Sony 2001 receiver	£120.00
Trio R1000 general cov receiver	£350.00
Yaesu FRG7700 + FRA7700	£425.00
Yaesu FRG 8800 + VHF	£499.00

PAY BY THREE POST-DATED CHEQUES

ON ANY ITEM OVER £100 IN VALUE

Simply divide the price into 3 equal payments. Write 3 cheques dated in consecutive months starting with today's date. Write your **TELEPHONE NO.,CHEQUE CARD NO. & EXPIRY DATE** on the back of each cheque. Post them to us, enclosing your name and address & we will (subject to status), send your goods immediately.

SHOWROOMS:- 1A MUNSTER ROAD, PORTSMOUTH PO2 9BS

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

Continued from Page 17

pulse to return a four figure coded signal that is specifically allocated to the aircraft before take off, which can at any time be requested by the ground controller. This will in turn be displayed on the ground console showing the aircraft's current azimuth position, plus additional information of use to the controller.

With supplementary equipment installed in the aircraft, it is also possible to display its altitude by selecting Code C on the transponder. During ATC transmissions, transponder operations are referred to as 'Squawk' and 'Squawk Ident'. In the event of radio failure in the aircraft, the crew can manually set the code, in this particular case to 7600 to warn ground controllers of a malfunction and likewise code 7500 indicates unlawful interference with flight, e.g. hijacking.

Antenna Systems

The h.f. transceiver active antenna is located in the aircraft vertical stabiliser and its automatically tuned prior to any initial transmission or a change of frequency. When the push to talk switch is operated, a continuous tone will indicate that tuning is taking place. The antenna for the VHF1 set is located on the upper fuselage and for the VHF2 set on the lower fuselage. A typical layout can be seeen in **Fig. 4.**

Future Trends

It does appear that airborne v.h.f. and u.h.f. operations will continue or some time as the backbone in air traffic control over land airways, although the line of sight rule does mean the range of reception is limited. This may mean developments will take place to improve reception on the margins of maximum range - about 400km, for present day equipment.

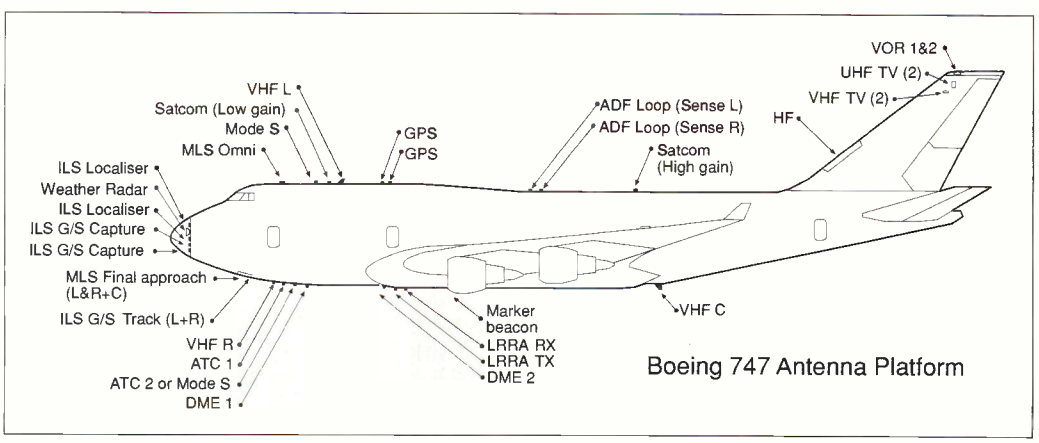
The exact locations of the v.h.f. and h.f. sets vary from aircraft to aircraft but in this case they are contained between the pilot and co-pilot's positions - the horizontal panel. There are in this case two v.h.f. sets and one h.f., the later being just above the fax output, to the bottom right hand of the console. *Photo courtesy of British Aerospace Airbus Ltd.*

The present airband allocation of 118.0 to 136.975MHz (12.5kHz spacing) will eventually be filled up which will probably mean a fundamental re-arrangement of frequency spacings, a considerable task for ATC planners. Mode 'S' transponder operations will eventually be fitted to all commercial aircraft enabling up to ten times the present in flight information to be relayed to the ground.

This will include a continous relay of airspeed, heading and conversely detailed weather states relayed from ground to aircraft in flight. With h.f. equipment, the problems of propagation and interference from a variety of sources remain, although there is less limitation on the range of h.f. radio equipment.

It seems likely that satellite communications will be developed with their superior signal transfer capabilities, to apply to all long distance air traffic control. Due to space limitation in the flight deck, smaller combined user friendly radio/navaid equipment will probably be developed in the future and that facsimile (operated by satellite received signals) will be a mandatory requirement for the exchange of weather data and company messages between aircraft and controllers. ■

Fig. 4: Typical locations of communications and other antennas within an aircraft fuselage. ***Bill Wilson***



Seldec Selcall Decoder

Selective calling (Selcall) codes, transmitted by air traffic control, provide a means of aircraft identification. The Seldec Selcall Decoder unit decodes the audio tones and displays the Selcall. Godfrey Manning G4GLM has been looking at this new unit.

Long haul flights can be boring - for the crew! Imagine eight hours flying from Europe to the USA across the North Atlantic. The auto-pilot follows the assigned track by reference to latitude/longitude waypoints pre-programmed into the inertial navigation system. The monotony is occasionally relieved by bartering with air traffic to obtain a more efficient, higher, cruising level - and there are the meals, of course!

Monotony could turn into downright fatigue if the crew were constantly monitoring their noisy h.f. receiver to make sure that they didn't miss any calls meant for them. Ordinary squelch isn't too good on h.f. - it would activate the receiver whenever there was a signal or even a burst of noise, with silences in between. That would still mean that every transmission would need to be checked in case it was intended for that particular flight.

The improved technique actually in use is a form of tone squelch or selective calling. Each aircraft is assigned a four-letter code, not resembling either its registration or callsign. Each letter is represented by an audio frequency tone as shown in the table (frequencies in Hz).

Letter	Tone (Hz)	Letter	Tone (Hz)
A	312.6	J	716.1
B	346.7	K	794.3
C	384.6	L	881.0
D	424.6	M	977.2
E	473.2	P	1083.9
F	524.8	Q	1202.3
G	582.1	R	1333.5
H	645.7	S	1479.1

When a message is to be sent to the aircraft, the controller transmits just the appropriate tones. On receipt of its assigned coded tones, the aircraft's receiver sounds a warning bleep in the cockpit and a light flashes on the instrument panel. The pilots therefore know to activate the receiver, which would otherwise remain silent.

There are some rules about the combinations of tones that can make up a code, the most important being that all four letters are different. The codes are sent as two pairs, each pair lasting one second, the two pairs separated by 200ms. Heard on a receiver the effect is of two harsh chimes, like a 'bing-bong' doorbell, only not at all musical. As an example, British Airways have a Boeing 757 registered G-BIKA. Its Selcall is KL-AF, and to contact it the two tones 794.3 and 881.0Hz are sent simultaneously for 1 second, followed, after a 200ms pause, by the two tones 312.6 and 524.8Hz sent simultaneously for a further second.

What Use Is Selcall?

Why would anybody be interested in Selcall if they weren't actually sat in the cockpit? When the Selcall code is known it is possible to have a good guess at the identity of the aircraft in question. Unfortunately there aren't enough codes to go round, so a little detective work is necessary. If the aircraft with Selcall KL-AF also has a 'Speedbird' (British Airways) callsign then that confirms its identity as G-BIKA.

Two books enable the aircraft's identity to be looked up when the Selcall is known. *JP Airline Fleets* is available from Air Supply, 83b High Street, Yeadon, Leeds LS19 7TA, price £28.50 plus £3.50 inland or £6.00 overseas postage. This lists aircraft by fleet, and you would have to scan the listing searching for the required Selcall code, which is hard work in the case of large fleets. Cheaper, but out of print, is *High in the Sky* from The Aviation Hobby Shop. I understand that this latter book will be updated and might be available by the time you read this article - watch my 'Airband' column. It's worth waiting for, since it does list Selcalls in alphabetical order, making them easy to look up.

What Do You Get?

The Seldec Decoder is neatly built in a metal case 225 x 175 x 70mm, with rubber feet. It needs an external power supply of 11-14V capable of delivering 350mA and a connection to the receiver's audio.

When a code is received correctly, two l.e.d.s illuminate on the top row corresponding to the first tone pair; then two more on the bottom row, for the second tone pair. The complete code is read off by noting the letters corresponding to the lit top-row l.e.d.s, then the letters corresponding to the lit bottom-row ones. Each row is read from left to right. Each time a code (or noise) triggers the l.e.d.s it is necessary to reset the unit to make it ready for further reception and extinguishing any illuminated l.e.d.s. Although the front panel has a reset switch, it is more convenient to use a remote button and a jack socket on

SCANMASTER TIMEWAVE LOWE MODEMASTER JPS AOR TRIDENT YUPITERU BEARCAT YAESU MARUHAMA SCANMASTER TIMEWAVE LOWE MODEMASTER JPS AOR

SCANMASTER TIMEWAVE LOWE MODEMASTER JPS AOR TRIDENT YUPITERU BEARCAT YAESU MARUHAMA SCANM

ASK ELECTRONICS LTD

We also stock a range of books for frequency scanning

248/250 TOTTENHAM COURT ROAD, LONDON, W1P 9AD • Tel: 0171-637 0353/0590 • Fax: 0171-637 2690

YOUR SONY SPECIALIST

All products covered by a total manufacturers guarantee

ICF-SW77 Similar specification to the ICF-2001D but with 160 memories & labelling facility £349.95

ICF-SW55	£249.95
ICF-SW100	£175.00
ICF-SW100S	£249.95
ICF-SW1E	£149.95
ICF-SW7600G	£159.95
ICF-PRO80	£299.95
AIR-7	£249.95
ICF-SW30	£89.95
ICF-SW33	£109.95
ICF-SW22	£69.95
ICF-SW10	£44.95
AN-1 Active SW ant	£59.95

ROBERTS

RC-818	£184.95
R-817	£159.95
R-808	£94.95
R-617	£120.95
R-621	£59.95
R-101	£49.95

AS ADVERTISED IN SW MAGAZINE

GRUNDIG AT ASK

Sattalite-700	£349.00
Yachtboy-500	£159.95
Yachtboy-400	£120.00
Yachtboy-230	£65.95
Yachtboy-222	£52.95
Yachtboy-206	£37.95
Yachtboy-205	£30.00
Concertboy-230	£35.95

MAIL ORDERS WELCOME ON THE ABOVE PHONE NUMBERS. FAST-EFFICIENT-CONVENIENT TO YOUR DOOR STEP!!

We also have in stock a range of Frequency Scanning Guides

UK Scanning Directory 4th Edition	£17.50
The VHF/UHF Scanning Guide	£12.95
Monitoring the World Above 30MHz	£19.95
Shortwave International Frequency H/Book	£14.95

Panasonic

RF-B45L
digital SW receiver £139.00

RF-B65D
digital SW receiver & ssb £165.00

SW Receivers

LOWE

HF-150	£355.00
KEY PAD	£34.95
PR-150	£190.00
IF-150 interface	£34.95

HANDHELD & BASE SCANNERS

YUPITERU

MVT-125II air band	£169.95
MVT-150 FM marine	£169.95
VT-225 civil & military airband	£239.00
MVT-7000 100kHz-1300MHz (no gaps)	£259.00
MVT-7100 500kHz-1650MHz	£365.00
MVT-8000 home base 8MHz-1300MHz	£349.95

AOR

AR-1500EX 500kHz-1300MHz	£310.00
AR-2800 500kHz-800MHz, 800-1300MHz	£395.00
AR-2000 500kHz-1300MHz	£274.95
AR-8000 100kHz-1950MHz no gaps	£415.00
AR-3000A 100kHz-2038MHz home base	£840.00
AR-3030 30kHz-30MHz home base	£615.00

TAX FREE FOR EXPORT.
MAIL ORDER
IMMEDIATE DESPATCH.
GOVERNMENT & LOCAL AUTHORITY ORDERS WELCOME

YAESU

FRG-100
50Hz-30MHz £509.95

FRG-9600
60MHz-905MHz £525.00

ALINCO

DJ-X1D
200KHz-1300MHz £295.00

ICOM

ICR-1
100KHz-1300MHz £349.00
(The smallest hand held scanner)

ICR-7100 homebase £1220.00

All products are subject to a posting & packaging charge

PLEASE MAKE ALL CHEQUES PAYABLE TO ASK ELECTRONICS AT 248-250 TOTTENHAM COURT ROAD, LONDON W1P 9AD

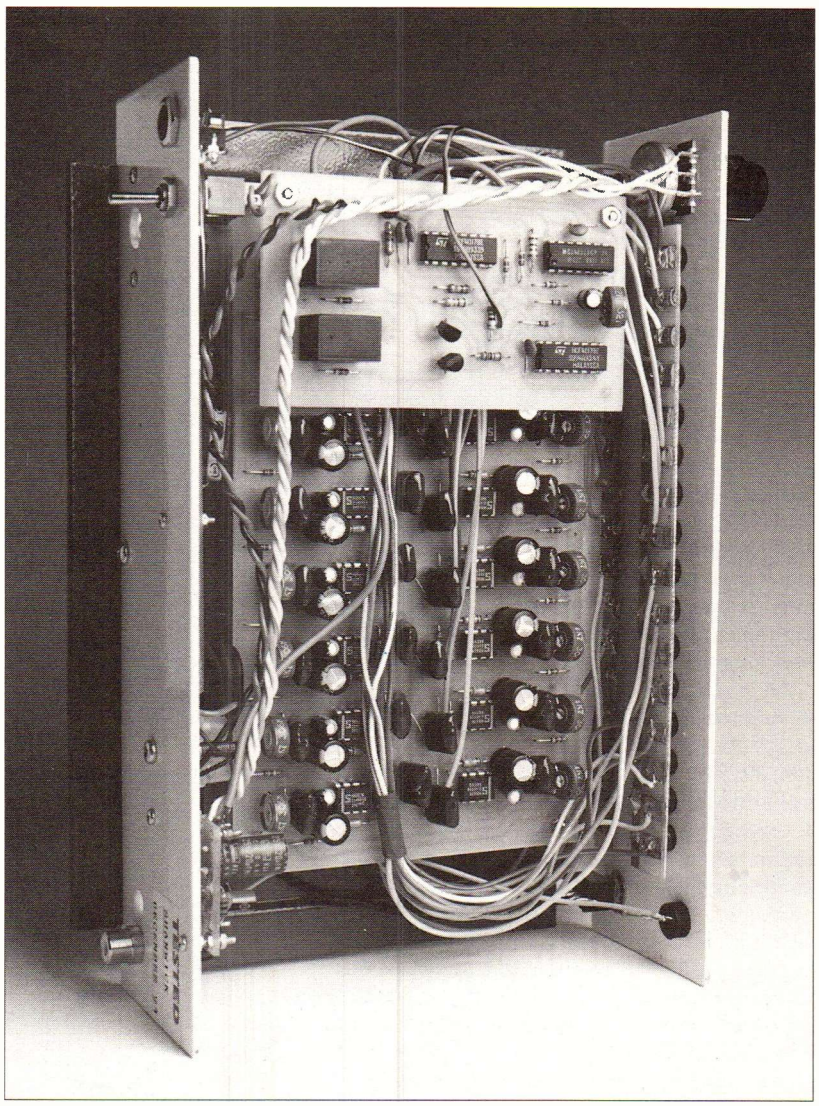
For the best prices give us a call on: 0171-637 0353

the back panel is provided for a momentary push-to-make switch. Seldec can supply one, but I think it's expensive. Two holes on the rear panel don't seem to do anything, one was covered with a label that said 'Tested Shanwick December 1994.' I don't know what this means - did they take it to Shannon or Prestwick for testing?

Sometimes, the controller's equipment sends tone bursts of double length and a switch on the back of the unit compensates for this eventuality. The front panel carries the power switch, green l.e.d. pilot light, the Reset push-switch and a knob to adjust the incoming audio level. Two rows of red l.e.d.s indicate the received code.

Taking a peep inside, I found good quality construction typical of commercial standards, with six glass fibre boards. The two main boards each have 16 audio filters based around the NE567 tone decoder chip. Each has a factory-adjusted pre-set potentiometer, so that there is one filter driving each l.e.d. The timing logic, including two relays, is on another board - when the two chimes are being decoded, you can hear the relays clicking. A small board - loose because a nut was missing - conditions the incoming audio. That leaves the power regulator board and the board to which the l.e.d.s are soldered. Although the wiring looms are neat, I would like to see sleeves at the ends of flying leads where they are soldered to tags.

An audio lead with a 3.5mm mono jack for the receiver end, and a power lead terminating in bare wires, are included. The two-page typed instruction sheet tells you all you need to know to operate the equipment but it is not, of course, a treatise on long-range navigation or radio procedure. It erroneously says that the aircraft is line-of-sight to the controller. If this were true, quiet v.h.f., not noisy h.f., could be used on long-distance routes!



Inside the Seldec Selcall decoder the construction is to typical commercial standards.

Making it Work

Because of the precise specification for the audio tones, your receiver must be exactly on frequency and remain stable. I suspect that a synthesised receiver with digital display is essential. As Selcall is mostly used on h.f. you will be receiving upper sideband. You know that the pitch of the received voice can be altered just by mis-tuning, well, so can the pitches of the Selcall tones. Incorrect tuning causes tones to be missed or else the wrong decode to be given (often the adjacent l.e.d. illuminating instead of the correct one).

The necessary audio level is set by the front panel knob. If speech peaks cause spurious l.e.d. illumination, the knob's turned up too high. Too low and it misses the tones. One pleasing aspect of the design is that it does not itself create any noticeable interference that could affect the receiver. By the nature of the equipment, any heterodyne interference on the frequency is liable to trigger it in error and render it impossible to decode Selcalls. Perhaps an audio notch filter would help if this happened?

I had terrible trouble getting the audio level right. The level at a typical receiver's tape-recorder output is fixed and so the front panel knob is the only adjustment. Given the ambient noise on h.f. you will need a good signal from the ground station to get the decoder to work reliably.

To be honest, I found that it seemed to mis-read more often than not. The most common error was to miss out one of the four tones altogether, which is strange when the others were correct. The level must have been acceptable and the frequency spot-on or nothing would have been received. With the amount of spurious triggering, the remote reset button becomes essential. Aircraft are receiving in an 'electrically quiet' environment - ground stations are not. Occasionally the unit seemed to be too quick to move on to the second tone pair whilst the first tones were still sounding, giving identical l.e.d.s showing on both rows. Flicking the 'double-length tone' switch wasn't the answer - the tones weren't that long, so this

resulted in four l.e.d.s illuminating, but all on the top row. If you were quick to spot the order in which they appeared, you could work out the Selcall. I suspect that the unit's internal timing is fixed, rather than waiting for the pause to detect the actual start of the second chime.

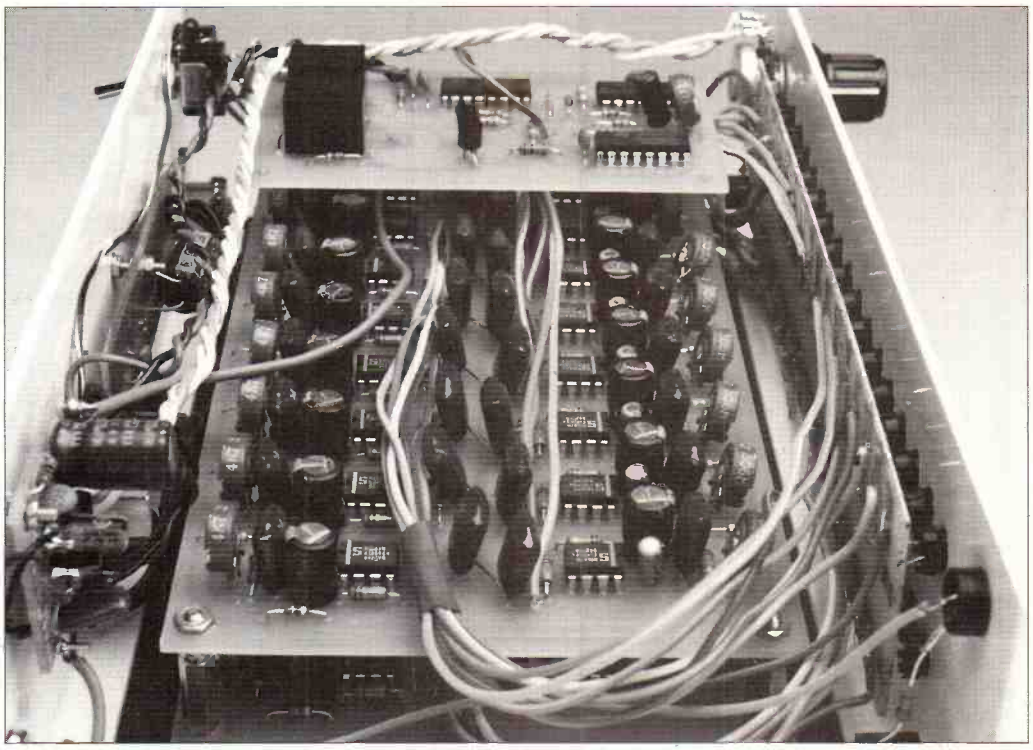
In Practice

When an aircraft first contacts an h.f. controller, it announces its Selcall, which is then checked. The announced Selcall can be looked up in a reference book. The Seldec decoder is useful where the initial contact was not noted and the controller now calls a flight to pass a message.

All in all, a good try at solving the problem, if not 100% reliable. Fed with a clear, strong, stable signal the unit undoubtedly works. However, if your receiver is not up to this, you may be be disappointed. I suspect the market will be limited at the asking price of £199.95 plus £5 postage. The remote reset button is £9 and extra audio or power cables are £1 per metre - all of which you could save on by doing it yourself. A power supply, at £12, would be useful if your existing equipment can't meet the requirements. If you have a special need, non-standard audio tones can be provided on request. The unit is guaranteed for one year against parts and labour but you must return it to the manufacturer for repair. My thanks to Seldec for the review sample. The Selcall Decoder is available direct from **Seldec, PO Box 3, Kidderminster, Worcestershire DY12 1YZ. Tel: (01299) 861372.**

Abbreviations

h.f.	high frequency
Hz	hertz
l.e.d.	light-emitting diode
mA	milliamperes
mm	millimetres
V	volts
v.h.f.	very high frequency



Seldec Comments

Thank you for letting me see the review of our Seldec Decoder and the opportunity to make the following comments.

The reviewer considers that the Selcall chimes are harsh. Heard on a properly adjusted receiver, the chimes are of a musical nature, being produced by an extremely expensive encoder that produces a pure tone.

The reviewer neglected to point out that Selcalls are transmitted in a.m. mode. The performance of a Seldec Decoder can easily be checked simply by switching to a.m. This will confirm two points, the first being that the decoder is performing as it should, the second that the receiver is correctly tuned.

The holes located on the rear apron are for future enhancements and are now 'bunged'. All flying leads are now sleeved where soldered to tags. The double length tone switch has now been discontinued as the fault at the transmitting station has now been rectified. The instruction book is now a printed version.

The reviewer considers that a 'synthesised receiver with digital display' is essential. This is, of course true. It is also an advantage to have a receiver that has a readout capable of displaying frequencies to at least 100Hz, or better still 10Hz.

The Seldec Decoder was developed using a Lowe HF-150, the only difficulty being in getting precisely on frequency after changing stations. Experience has shown that with all the Lowe HF series receivers it is necessary to slightly adjust the tuning knob to s.s.b. offset.

However, on receivers such as the NRDs and AOR3030, no such adjustments are necessary. We have not been told what receiver the reviewer has used and had we been asked for assistance, perhaps we could have helped.

It must also be remembered that an aircraft's Selcall decoder is looking for a fixed code and needs all four letter to actuate the alarm. The Seldec Decoder is looking for all and any Selcall to actuate it.

Of course, it may be affected by hetrodynes on frequency, as a hetrodyne is heard as an audio frequency and the Seldec is looking for an audio frequency. The rather strange comment about a notch filter seems to be rather odd as a notch filter would notch out the unwanted frequency, of course, but what if this unwanted frequency was within the Selcall range of audio frequencies?

A test was conducted by Shanwick Radio when a block of some 20 Selcalls were transmitted on 5.649MHz and a distant Seldec Decoder using an AOR AR-3030 receiver was seen to read with 100% accuracy. The reliability of the Seldec Decoder has been proved to be rather better than the on-board decoders. A serious Selcall listener will know how many mis-calls are retried by the Oceanic control centres.

Given a receiver that is stable and can be tuned with a degree of accuracy, a good signal (good signal to noise) the Seldec Decoder will perform as it should. The 100 or so users of the Seldec Decoder will be disappointed that the reviewer did not take the trouble to seek answers to his difficulties, the solving of which would have increased his enjoyment of our product. ■

S.M.C., A.R.E. & REG WARD

THE UK'S NO1 INDEPENDENT RETAILER FOR ALL YOUR RECEIVER REQUIREMENTS
Established 1958

We believe in offering our customers the best deal possible. By dealing direct with the manufacturer we are in effect "cutting out the middle man". Consequently, we are able to offer LOWER PRICES than previously possible.

THIS MONTHS SPECIAL

AR-8000 Scanning Receiver

Save £67

Only £359

1500KHz-1900MHz

Carr B

HF RECEIVERS

AOR AR3030 Carr D
30kHz-30MHz..... OUR PRICE **£659**

KENWOOD R-5000 D
100kHz-30MHz..... OUR PRICE **£899**

ICOM R-71E D
100kHz-30MHz..... OUR PRICE **£985**

ICOM R-72DC D
100kHz-30MHz..... OUR PRICE **£749**

ICOM R-100 C
500kHz-1.8GHz..... OUR PRICE **£565**

YAESU FRG-100 D
50kHz-30MHz..... OUR PRICE **£445**
+ FREE PA11C Mains Adaptor

SCANNING RECEIVERS

NEW

AOR AR-2700
Handheld scanner 500kHz–1300MHz

Introductory price

ONLY **£249**

YAESU FRG9600 Carr C
60-905MHz ..... OUR PRICE **£529**

ICOM ICR-7100DC D
25MHz-2GHz .... OUR PRICE **£1229**

ICOM ICR-1 B
2-905MHz..... OUR PRICE **£355**

MVT-7100 B
500kHz – 1650MHz .. OUR PRICE **£349**

AOR AR3000A D
100kHz-2036MHz .. OUR PRICE **£849**

AOR AR2000 B
500kHz-1300MHz.. OUR PRICE **£279**

AOR AR1500EX B
500kHz-1300MHz . OUR PRICE **£315**

SONY RECEIVERS

ICFSW100E	OUR PRICE £179	B
ICFSW1E	OUR PRICE £159	B
ICFSW7600G	OUR PRICE £159	B
ICFSW55	OUR PRICE £249	C
ICFSW77	OUR PRICE £359	C
PRO-80	OUR PRICE £315	B
AIR-7	OUR PRICE £269	B

AEA TNC's and Data Modems

PK12 – A new VHF TNC that offers superb performance and simplicity of operation.
ONLY **£119.00** INC Carr B

PK12/100K – 100k Mail Drop Memory Upgrade **£39.95** Carr A

PK232/MBX – An old favourite that still offers state of the art performance.
BETTER VALUE THAN EVER AT
ONLY **£299.00** INC Carr C

PK900 –Deluxe multimode data terminal.
ONLY **£459.00** INC Carr C

PK96 – 9600 Baud packet TNC with 14k of mail drop memory.
£189.00 INC Carr B

PAK WIN windows based s/ware only **£79.00** Inc. Carr A

ANTENNAS

Diamond D130 outdoor Discone antenna 25-1300MHz RX, Tx 50, 144, 430, 1200MHz amateur bands **£79.95**

Comet CH-600MX BNC whip 120-1300MHz RX, Tx 144, 430, 1200MHz amateur bands **£25**

Special Offers subject to availability Carriage B=£5.00 C=£7.50 D=£12.50 E=£16.50

Service Department Direct Line Monday – Friday 9am – 5pm (01703) 254247

Showroom Hotline Tel: (01703) 251549 HQ Main Office Tel: (01703) 255111

Access VISA

SOUTHAMPTON
South Midlands Comms Ltd.
S M House, School Close
Chandlers Ford Ind Estate
Eastleigh, Hants SO5 3BY
Tel: (01703) 251549/255111
Fax: (01703) 263507

LONDON
ARE Communications
6 Royal Parade
Hanger Lane, Ealing
London W5A 1ET
Tel. 0181-997 4476
Fax: 0181-991 2565

AXMINSTER
Reg Ward & Co
1 Western Parade
West Street
Axminster EX13 5NY
Tel. (01297) 34918
Fax: (01297) 34949

LEEDS
SMC (Northern)
Nowell Lane Ind. Est.
Nowell Lane
Leeds
Tel. 0113-235 0606
Fax: 0113-235 0155

CHESTERFIELD
SMC (Midlands)
102 High Street
New Whittington
Chesterfield
Tel. (01246) 453340T
Fax: (01246) 453340

BIRMINGHAM
SMC
504 Alum Rock Road
Alum Rock
Birmingham B8 3HX
Tel. 0121-327 1497
Fax: 0121-327 6313

Calls, Selcalls & Squawks

Aircraft use a variety of methods to identify themselves. Dick Moon explains callsigns, Selcals and 'squawks'.

In 1987 the International Air Transport Association decided to allocate all aircraft operating services a three letter code for identification purposes, instead of the previous two letter codes. For example, BAW = British Airways, JAL = Japan Airline, AFR = Air France and MAU = Air Mauritius.

Some airlines use callsigns that are in keeping with their company logo. British Airways has a similar logo to a bird and therefore adopted the callsign SPEEDBIRD, while Pan-Am based their callsign on the old flying boats, which were named after the old sailing vessels, hence the call CLIPPER, and of course the airline here in South Africa is known as SPRINGBOK.

Non-commercial aircraft also have specific callsigns. The RAF uses the call ASCOT for its transport aircraft and RAFAIR for aircraft on a refuelling mission. The Queen's flight uses KITTYHAWK for the Queen's aircraft and RAINBOW for Prince Philip's plane while Prince Charles's aircraft has the call UNICORN. Those planes are based in Benson in Oxfordshire.

The US Air Force has numerous callsigns. For example, MAC refers to the military airlift command, TAC denotes the Tactical air command while SAM includes all Special Air Mission aircraft known as MYSTIC STAR. These latter include planes used by high government officials such as AIRFORCE 1 used by the President and AIRFORCE 2 for the vice-President.

The Canadian Air Force uses the call CANFORCE followed by three or four digits denoting the type of aircraft, e.g. CANFORCE (or CFC)4XX is usually a C130. The French Air Force have the call sign FOX MIKE.

Lufthansa's fleet of airliners is based at Frankfurt airport.

Selcals

Quite often, when listening to aircraft communicating with ground stations, you will hear a request for a Selcal (selective call), and the response will be a four-letter group such as ALPHA DELTA HOTEL MIKE. This is a code that is allocated to aircraft by Aeronautical Radio Incorporated (ARINC), a controlling body owned by the airlines.

Selcals are normally unique to each individual aircraft, although on occasions duplicates are issued, but only if the aircraft are operating in different parts of the globe. They are issued in blocks to individual companies, who then allocate them to their aircraft, retaining them on a permanent basis and re-allocating them to newer aircraft on the withdrawal of older models.

As mentioned, Selcals consist of four letter groups, the second and fourth letters being always higher in value than the first and third. For example, AE-GK is correct, but not EA-KG where A=1, B=2, C=3, etc.

The object of Selcal is to avoid the radio operator having to listen continuously for messages from ground stations. If a station requires to contact a particular aircraft, the operator transmits the Selcal letters and a 'ding-dong' sound is heard on the flight deck, while at the same time a light flashes on the panel.

Squawk Codes

Squawk codes, consisting of four digit numbers, are issued by local air traffic controllers. They are used by aircraft on approaches to airfields to identify themselves and to show their position. On request, the radio operator dials the four digit code into his transmitter, called a transponder, and an enlarged blip is produced on the ground station's radar screen indicating the plane's position and identity.

All the codes are stored in computers, and if a duplicate code is accidentally assigned to another aircraft, the computer will refuse to accept it. Another code will then have to be allocated.

These transponders are known by the code 4096 as that is the number of combinations that can be programmed into the transmitter. Most of the codes relate to the identification of the aircraft, but there are a few codes used in specific situations, for example 7700 is a MAYDAY emergency call, 7600 indicates a loss of radio contact, and 7500 indicates a Hijack.

I hope this brief article has thrown a little light on the way in which aircraft identity themselves, and has perhaps made your listening a little more interesting. ■

AB118 Active Airband Antenna From Howes Communications

Newcomers to airband listening are often puzzled by the ability to hear the aircraft but not the ground controllers. Bob Sayers has built the Howes Communications AB118 Active Airband Antenna as one solution to the antenna problem.

A large proportion of *SWM* readers listen regularly to aeronautical communications on the v.h.f. aircraft band. If you live close to an airport, or take your scanner on a visit, this will generally be perfectly successful using an airband receiver with its own telescopic or helical whip. At home, however, particularly if the local airport of interest is 30 or so kilometres away, listening can be frustrating because it will often be impossible to hear the ground station, even though signals from aircraft are still S9 or greater.

This often puzzles newcomers to airband listening, but can be quite simply explained. Aircraft that are quite close to the airport they are approaching or leaving will often still be in radio 'line of sight' to a listener, even though the airport may be thirty or forty miles away. In the same way, an aircraft that is overhead the listener's position can maintain perfect communications with the airport, simply because it is in line of sight with it.

Airport transmitters are generally of fairly low power (often less than the powers used at v.h.f. by radio amateurs) and are connected to relatively simple antennas on the control tower roof. As in any other part of the radio spectrum, frequency allocations are scarce, and any particular frequency will be reused several times throughout the country. The combination of transmitter power and antenna will therefore be chosen to provide the best possible cover within the area in which an aircraft might reasonably expect to call Approach, or to request a Radar or Flight Information Service, whilst not impinging on the area of a distant airport which shares the same frequency.

This general works satisfactorily for the pilot and the airport operator, but is of much help to the aircraft radio enthusiast! What is needed, of course, is to modify the listener's receiving installation so that all the signals what you wish to hear become 'line of sight'. This ideal will not generally be possible to achieve, but the closer that you can approach to it, the more success you will have.

Suitable Antenna

The first step, therefore, is a suitable antenna, mounted in as high and unobstructed position as possible. This must be connected to the receiver with good quality coaxial cable and correctly installed connectors. These topics have been covered many times in previous *SWM* articles and in the books which are available on v.h.f./u.h.f. listening, and these basic requirements cannot be repeated too often. But what is 'a suitable antenna'?

Many readers will have listening interests wider that just the v.h.f. aircraft band of course, and for them the choice of a suitable antenna will always have to involve a degree of compromise. For the dedicated airband listener, however, or for anyone prepared to dedicate an additional antenna specifically for this band, the only real solution is an antenna designed to give of its best for this range of frequencies, even if this results in a diminished performance in other bands.

The v.h.f. aircraft band is 20MHz wide (30MHz if the navigation part of it is included), and this presents quite a challenge to the antenna designer to retain performance from one end of the band to the other. Previous solutions have generally been for the professional market, and for this reason have been expensive. Fortunately, a low-cost solution is now available to the amateur market, whilst still providing very high performance. Components costing £18.80 or as a set of assembled modules requiring only final completion and installation costing £25.90. Postage and packing costs an additional £1.50 in the UK.

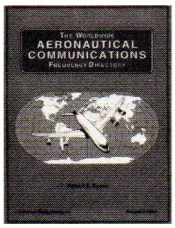
The amplification of weak signals is not the end of the story with this Howes unit though. Some airband receivers, particularly some of the hand-held models with a wide frequency coverage, do not possess particularly good rejection of strong signals on frequencies out of the band which is being listened to. This manifests itself by non-aeronautical signals appearing to be heard within the airband

If the AB118 was just a broadband device amplifying signals over a wide frequency range, it would simply worsen this situation. Instead, the optimisation of the AB118 for the aircraft band includes the provision of bandpass filtering effective over the range 118-136MHz, outside of which signals are sharply attenuated. In choosing this range, Howes have covered only the 'communications' as opposed to the 'radionavigation' part of the aircraft band, presumably and quite sensibly having decided that the latter is of little interest to the hobby listener. This does mean, of course, that it is no use expecting the AB118 to provide even slight improvement to reception outside of the airband - if the filter is doing its job correctly, non-airband reception should be

LOWE BOOKSHELF

Radios are great things, opening your mind to a welter of broadcasts and communications. A number of good books kept by your receiver will help you to get more out of your listening and expand your knowledge. Here's what's currently sitting by my receiver . . .

WORLD AERONAUTICAL COMMUNICATIONS FREQUENCY DIRECTORY



Quite the best guide to HF airband monitoring we've ever seen. Extensive explanations, including a chapter covering ACARS.

£19.95 plus £3.00 p&p

CALLSIGN '95

New from Photavia Press

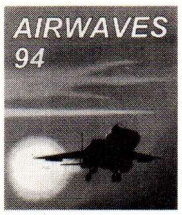
A useful companion to AIRWAVES '94, this book gives you an alphabetical listing of civil and military aviation callsigns. For military traffic, this allows you to discover the aircraft type, the air arm it belongs to, it s unit code, squadron and base. For civil callsigns, you can find out the three-letter air traffic prefix, company or operator and country of origin. A super book that will help you get more out of airband monitoring. 108 pages, A5.

£7.95 plus £1 p&p

AIRWAVES '94

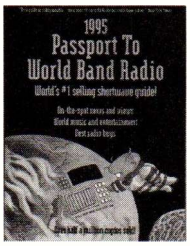
from Photavia Press

The best frequency guide we've ever sold for the airband enthusiast. Covers H.F., civil and military frequencies. Comprehensive coverage of UK stations, listed by airfield and cross-referenced by frequency. Major European frequencies are also covered. 88 pages, A5.



£7.95 plus £1 p&p

PASSPORT TO WORLDBAND RADIO '95



The definitive guide to English language short-wave programs. Also crammed with informative articles about world radio stations and the broadcasters themselves and a very comprehensive guide to buying short-wave receivers.

£14.95 plus £2.00 p&p

UNDERSTANDING ACARS

by Ed Flynn

All the necessary information including: Report Forms, Abbreviations, Airport identifiers, Airline identifiers, and much much more.

£9.95 plus £2.00 p&p

HOBBYIST'S GUIDE TO COMINT COLLECTION AND ANALYSIS

By Tom Roach

Communications intelligence (COMINT) is considered by most governments as the most sensitive and secret of all their intelligence activities. Now you can get in on the act! This book covers the equipment you need, how to put it all together and then how to analyse the material collected. An excellent little book that makes fascinating reading.

£19.95 plus £2.00 p&p

INTERPRETATION OF FACSIMILE WEATHER MAPS AND CHARTS

By Philip C Mitchell

Decoding weather information is one of the many things you can do with a short-wave receiver and a computer. What you do with the maps and charts received is then a problem! Recently updated, this manual provides over 70 pages of useful information that will help you interpret what you receive. 73 pages, A4 size.

£8.95 plus £2.00 p&p

WEATHER REPORTS FROM RADIO SOURCES

By Philip C Mitchell

A useful little publication covering many aspects of weather watching. Includes broadcast sources as well as VOLMET stations, there is even a guide to "decoding" VOLMET data. UK sources are covered as well as the major regions of the world. 35 pages A4 size.

£6.95 plus £2.00 p&p

You can pick these up from any Lowe branch or order by 'phone or FAX or E-mail via the Internet.

We've now expanded our communications systems to include the Internet. You can contact via E-mail for speedy processing of orders or information requests. We have two Internet addresses for your convenience, orders@lowe.demon.cc.uk. to place your order or if you would just like the information on any of our products, use info@low.demon.co.uk. Please include your postal address and daytime telephone number.

Lowe Electronics

LOWE

Chesterfield Road, Matlock, Derbyshire DE4 5LE Tel: (01629) 580800 Fax: (01629) 580020

noticeably worse!

So, what do you get for your money? The AB118 consists of a small printed circuit board containing the preamplifier, to which the coaxial cable to the receiver is connected. Also connected to this board is a short length of 300Ω ribbon feeder. For those readers who have never yet met 'ribbon' feeder, it is a type of cable used extensively at h.f. by radio amateurs, and consists of two parallel plastics coated wires. The two wires are not immediately adjacent to each other, but instead are at either edge of a continuous flat plastics strip which keeps them approximately 8mm apart.

The short feeder is connected in turn to another small p.c.b. forming the matching unit, the two of which form an impedance matching circuit, the actual antenna element being a longer length of ribbon feeder connected to the other end of the matching unit. Since the preamplifier requires 12V d.c. power in order to operate, for convenience this is fed to the antenna via the coaxial cable. Another small printed circuit board, the interface unit, installs close the receiver to superimpose the d.c. onto the coaxial cable, and to provide isolation so that this current is not presented to the receiver's antenna socket. A switch on the interface unit allows the amplification to be reduced by approximately 5dB. This facility would be useful when there is a local station not requiring the higher level of amplification. The purchaser needs to supply a suitable box to enclose this unit, and also a suitable 12V supply capable of providing 100mA.

All printed circuit modules and components are to Howes usual high quality, and the assembly instructions provided should make this a straightforward project for anyone with some previous construction experience. It is probably not an ideal first construction project, however, unless under the supervision of a more experienced builder.

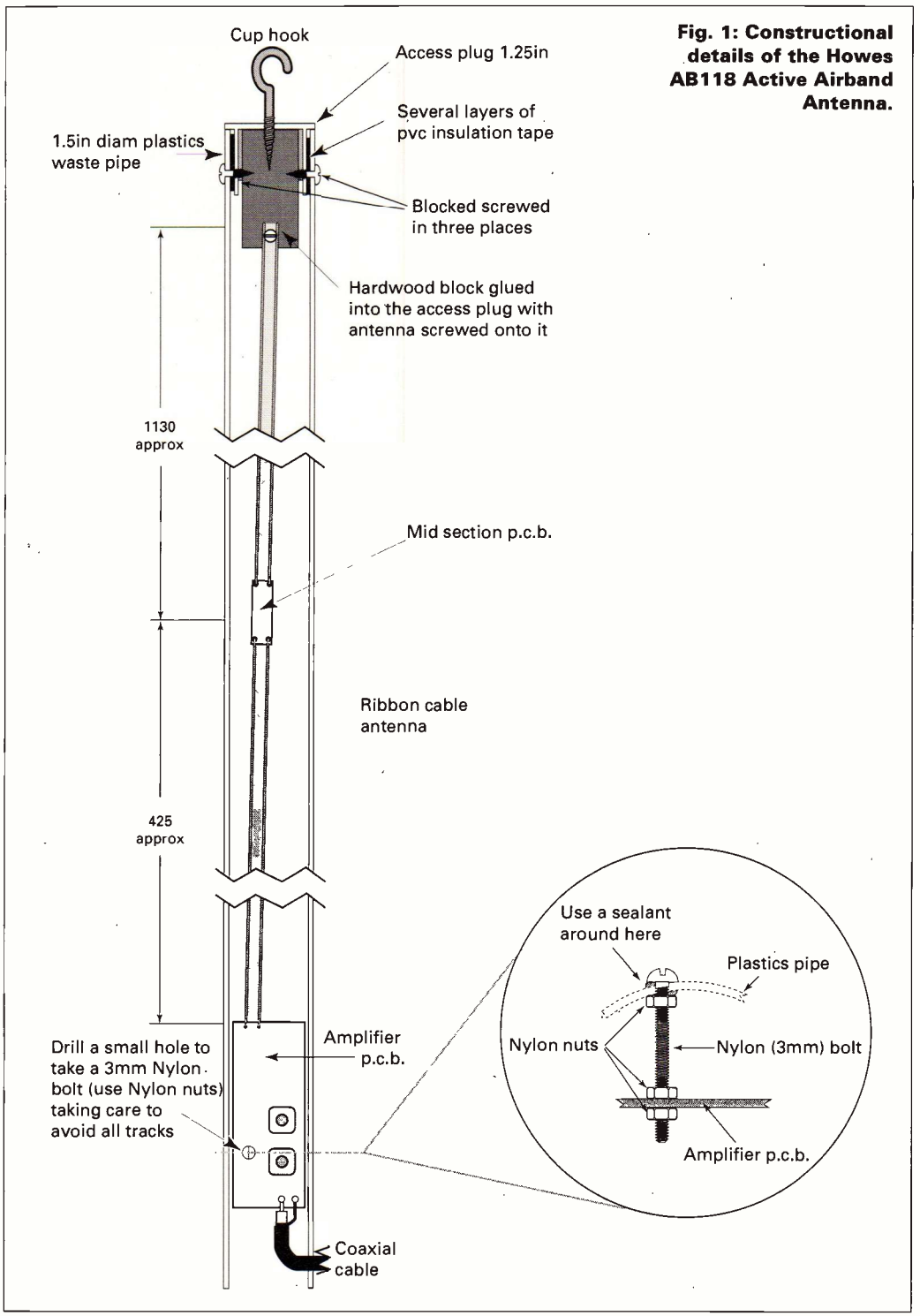


Fig. 1: Constructional details of the Howes AB118 Active Airband Antenna.

One major advantage of the use of ribbon feeder to form the elements of the antenna is that means the entire unit can be rolled up, and perhaps taken on holiday or to a temporary site. Equally, the antenna can simply be 'hung' by its top end, perhaps in a window. If either of these methods is used, however, it will be necessary to strengthen and provide some mechanical support for the soldered joints on each of the p.c.b.s, if the unit is to last long without repairs.

For a more permanent installation, and certainly if the antenna is to be used out of doors, Howes recommend the use of a pvc waste pipe and fittings to provide a simple, weatherproof form of protection, and the instructions provided suggest how to simply install the antenna into such a pipe. However, my own antenna was likely to face quite a busy life, so I elected to put a little more work into this part of the project, and produce a unit which would give many years of service. My additions, and slight modifications to the original Howes instructions are described at the end of this article, and in the accompanying diagrams.

Amateur Radio Communications Ltd

Tues to Sat 10 – 5pm

NO PRICES LISTED THIS MONTH!
BECAUSE WE WILL MATCH ANY GENUINE ADVERTISED PRICE, BUT AS OUR REGULAR CUSTOMERS WILL TELL YOU, WE CAN OFTEN DO AN EVEN BETTER DEAL. WHY NOT PHONE US NOW!

TEL: 01925 229881
Fax: 01925 229882

MVT-7100

A superb receiver, very sensitive with a coverage of 500kHz–1650MHz. Just the right size for a hand-held receiver. One of the most popular scanners we have ever sold.

£379

AR-8000

This scanner is the result of AOR's long term ambition to produce a new breed of radio receiver which combines full computer compatibility with advanced wideband receiver technology. It is the ONLY scanner to cover 500kHz–1.9GHz. Our best selling scanner to date!

PHONE

AOR-3000A

£853

Full coverage from 100kHz–2036MHz with lots of extra features including a RS-232 interface for computer control. Remember the saying "all good things come in small packages" well the AOR-3000 proves it is true.

NEW ON THE MARKET.
AR–2700
500kHz–1300MHz.
Full coverage with fm & am, optional 20 second voice recording module.

TRIDENT 1200 Handheld 100 Channel memory 500kHz–1300MHz. No Gaps
£299

NEW UK SCANNING DIRECTORY 4th edition
£17.50

SECONDHAND BARGAINS

You have cleared our shelves of secondhand Receivers/Scanners, apart from the three listed below!! Please phone with your requirements, as additional stock will have arrived in before you read this advert.

Drake SW-8 ..... boxed in mint condition £450
Sony SW-77 ..... £295
Icom IC-R1 ..... £250
? ..... £Good price
? ..... £Unbelievable
? ..... £Phone

URGENTLY WANTED – GOOD QUALITY RECEIVERS/SCANNERS

INSTANT FINANCE AVAILABLE at low APR rates

VISA Access SWITCH

FREE PARKING

38 Bridge Street, Earlestown, Newton-le-Willows, Merseyside WA12 9BA

Scanning Receivers

TR2400

- 100kHz to 2060MHz, continuous coverage
- 1000 programmable channels
- SSB, CW, AM, NBFM, WBFM modes
- Search and scan facilities
- Excellent sensitivity
- LC display with signal strength meter
- Supplied with high-capacity ni-cad batteries, mains charger/adaptor, earpiece aerial, carry strap, belt clip, 12Vdc lead and manual.

£369.00
40-12400

MVT7000

- 100kHz to 1300MHz, continuous coverage
- 200 programmable channels
- AM, FM and WBFM modes
- Search and scan facilities
- Excellent sensitivity
- LC display with signal strength meter
- Supplied with ni-cad batteries, mains charger/adaptor, telescopic aerial, carry strap, belt clip, 12Vdc lead and manual.

£289.00
40-17000

MVT7100

- 530kHz to 1650MHz, continuous coverage
- 1000 programmable channels
- SSB, AM, NBFM, WBFM modes
- Search and scan facilities
- LC display with signal strength meter
- Supplied with high capacity ni-cad batteries, mains charger/adaptor, telescopic aerial, carry strap, belt clip, 12Vdc lead, earpiece and manual.

£389.00
40-17100

MVT8000 Base/Mobile

- 100kHz to 1300MHz, continuous coverage
- 200 programmable channels
- AM, FM and WBFM modes
- Search and scan facilities
- LC display/keypad illumination with signal meter
- Supplied with mains adaptor (240Vac use), adjustable whip antenna, mobile mounting kit, 12Vdc lead and manual.

£369.00
40-08000

Full details of all the above are included in our comprehensive catalogue, £1.95 (plus 30p p&p)
All the above are currently in stock and available for immediate delivery. Standard p&p £1.50, next day delivery £5.29 (UK Mainland).

All prices include VAT (at 17.5%)

Cirkit Access VISA

Cirkit Distribution Ltd
Park Lane · Broxbourne · Hertfordshire · EN10 7NQ
Telephone (01992) 448899 · Fax (01992) 471314

Using It

Once assembly is complete, and the coaxial cable from the interface unit fitted with a suitable plug and connected to your receiver, all that remains is to provide a suitable 12V supply. I tested the unit on a variety of power sources, and it would seem that it will pay to take a little care here. One supply tested, which I already suspected may have been prone to mains hum, produced symptoms of an S7 signal on the receiver l.c.d. bargraph strength meter, but without opening the squelch.

If you have a regulated, well smoothed bench power supply, this can certainly be used, but bearing in mind the unit's power consumption of less than 100mA, the best solution may well be a battery pack, which makes portable use of the antenna easy. In most cases, it is vest not to try to 'steal' 12V form the typical power units supplied with receivers - most of these have insufficient capacity to supply both the receiver and an accessory.

The AB118 will certainly improve your airband listening, but it should still be given every help to do this. As the Howes instructions tell you, the antenna should still be mounted as high, and in the clear, as possible. Care should certainly be taken to keep the antenna clear of metallic objects, since these will have a considerable de-tuning effect.

How Does It Perform?

In short, it performs very well indeed. But do not expect this antenna to bring in v.h.f. signals from hundreds of kilometres away. Howes know as well as anybody that providing absolute gain would produce more problems, in the form of receiver strong signal handling, than it would solve, and have come up with an excellent compromise.

The AB118 is at its best solving the problem that we began this review by discussing, and at the receiver's (normally poor) location has the effect of enabling ground based communications to be heard reliably over distances of up to thirty miles, and of course, airborne signals at considerably greater distances than that.

Perhaps Howes will now consider an optimised antenna for u.h.f. airband....

Building The AB118

Part numbers quoted are those items stocked by Texas stores, but similar parts can be obtained by any d.i.y. or hardware store. Please note three details, however, if purchasing the 'plumbing' items before taking delivery of the Howes kit:

1) Only use white waste pipe and fittings. Other colours of pvc material contain additives such as carbon, which will affect the electrical properties of the antenna.

2) Whilst the waste pipe used is 1.50in diameter, the 'Access Plugs' used to seal the ends must be 1.25in type - 1.50in diameter Access Plugs will not fit into 1.50in piping!

3) Do not be tempted to use other items of the pvc plumbing system to mount the completed antenna, other than 1.50in Pipe Clips such as Oracstar WF75. Whilst joining components such as couplers to form waterproof joints when the system is used as a waste pipe, they are not strong enough to mount the antenna to the top of a pole or mast

Take one 1.25in Access Plug, carefully mark the centre, and drill a hole of approximately 2mm. Take the small piece of wood (hardwood is best, but any reasonably strong piece will do, although softwood types should be varnished or painted before use) and drill a small pilot hole of approximately 2mm down its centre from one end. Coat the drilled end of the wood, and the centre area of the inside of the cap with epoxy adhesive. Place the hook through the cap, and into the pilot hole in the timber. Screw up tight and put these parts aside to set overnight. When the glue is set, the gap between the timber and the side of the plug can be filled with a suitable waterproof filler. Carefully straighten the length of ribbon cable and smooth out any kinks caused by folding.

If you have purchased the kit version of the antenna, complete the assembly following the Howes instructions carefully. Do not cut the pipe yet! It is a good idea to test the unit at this point, to save having to remove it from the pipe at a later date! If you are satisfied that it is working correctly, make a small hole in the centre of the ribbon cable, approximately 5mm from the 'top' end. Attach this to one side of the wooden block, using a brass wood screw and washer.

Parts required in addition to items supplied in the Howes kit

Box to house the interface module; 1 2m length of white pvc waste pipe (Oracstar WF52); 1.25in Access Plug (Oracstar WF32); Piece of hardboard, approx. 15mm section, approx. 50mm long; 'P' - cable clips (3); Brass or plastics coated cup hook, approx 15mm in diameter; Nylon or brass 3mm cheese-head bolt with three nuts; Suitable length of good quality 50Ω coaxial cable; Plug to suit receiver antenna socket; Epoxy adhesive; Weatherproof filler (Exterior Polyfilla); Quantity of small round-head brass wood screws; Length of adhesive insulating tape;

Also either 1.25in Access Plug (Oracstar WF32) or 1.50in straight coupler (Oracstar WF37); 1.50in Access Plug (Oracstar WF39).

Assistant

The next few steps work better with several pairs of hands. If you are not naturally blessed with this advantage, it is worth finding an assistant! Lay the pipe down flat, and place the Access Plug not into the pipe, but with its flange against the end, with the ribbon cable and amplifier module laid along the pipe. Try to make the ribbon as straight as possible, without putting undue tension on the soldered connections. Mark the two ends of the amplifier module onto the pipe with a soft pencil, and lay all the electronic parts to one side, Mark a pencil line all round the pipe approximately a further 25mm towards the nearest end of the pipe, and carefully cut around this line. A 'Junior' hacksaw is best for this purpose - try to keep the cut as square as possible.

Now drill a hole approximately 3mm diameter through the amplifier module printed circuit board. (Please carry out this step very carefully, and examine both sides of the p.c.b. before drilling. Note that this step is not part of the Howes instructions, and may invalidate their warranty if carried out carelessly. The modification is not difficult, but if you have any doubts about your ability, please find another method of securing the module board into the tube).

It should be possible to drill through one of the large p.c.b. lands (silver coloured areas) slightly to the side of the centre, and about 4mm from the end of the board. Do not drill through a narrow land, or through a bare part of the board which would result in the mounting bolt bridging two lands. Lay the

module on the outside of the tube again, and mark the position of the hole which you have just drilled onto the pipe, and drill a 3mm hole through the pipe at this mark.

If the coaxial cable is not attached to the amplifier at this point, solder it carefully in place now following the Howes instructions. The electronic parts of the antenna can now be lowered into the pipe from the 'top'. Whilst a 1.50in diameter Access Plug will certainly not fit into a 1.50in piping, a 1.25in one is not a snug fit either, and it will be necessary to pack the plug with several turns of pvc insulating tape until it can just be slid into the pipe without forcing.

Before finally pushing the top assembly into place, note its position with respect to the hold you have just drilled to mount the amplifier module, so that the 'top end' and module install without the ribbon cable between being twisted. These small (2mm) pilot holes are drilled through pipe, plug, and filler, and the whole top end secured by brass wood screws. (If two of these are placed 180° apart, and the third at 90° to them, the correct alignment for the top end will be retained if ever this has to be removed).

Decision

Two methods can be used to finish the bottom of the pipe and a decision must now be made which you wish to adopt. The simplest method is simply to use another 1.25in Access Plug wrapped with insulation tape as just described. It is probably better to drill the hole for the coaxial cable entry in the side of the pipe, however, rather than in the plug as described in the Howes instructions, since this makes it easier to stand the completed antenna on one end. Drill the hole under size and open it up with a reamer until the coaxial cable can just be pushed through, to ensure a waterproof fit. Before finally assembling the antenna, tie a single-turn knot in the cable inside the pipe to provide some degree of strain relief, and avoid any direct stress on the soldered connections. Do not pull the knot tight and thus avoid any risk of damaging the cable.

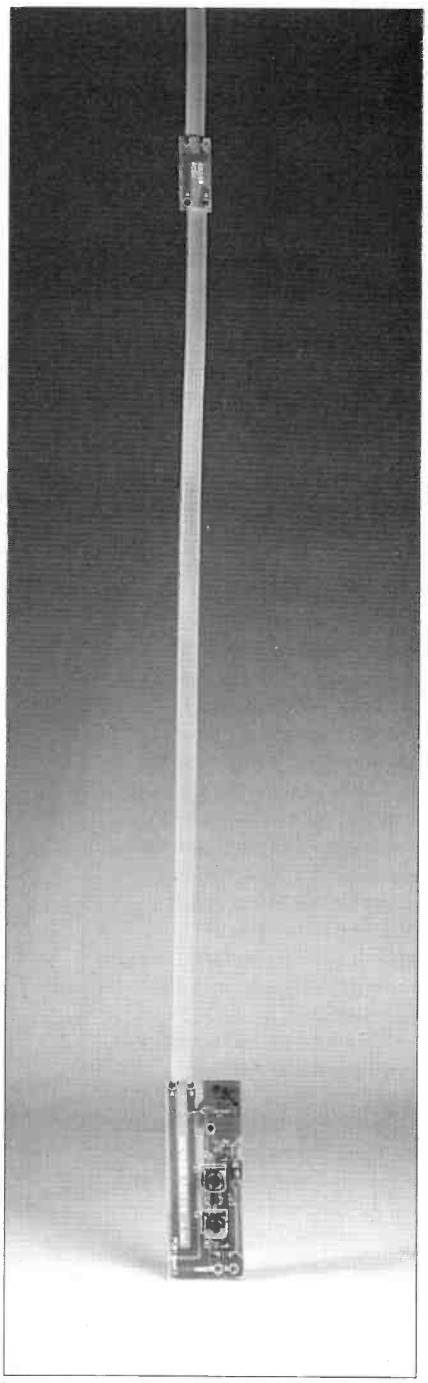
The alternative method is to fit a 1.50in Straight Coupler to the end of the pipe. I considered that this made the whole unit look slightly more 'professional' - besides, I already had a coupler that I wanted to use up! If you adopt this method, the coaxial cable exits through the wall of the coupler, rather than through the pipe, and the coupler should be attached to the pipe by a couple of small screws to prevent any chance of it rotating. If you use the coupler, this is where you can use a 1.50in Access Plug to seal the bottom, rather than the 1.25in!

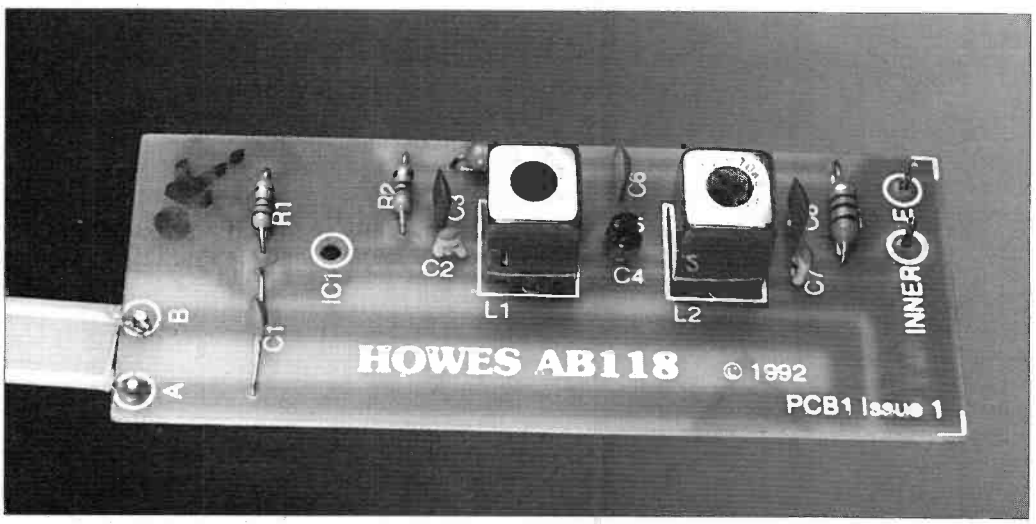
Whichever bottom end method was chosen, the amplifier can now be secured in place using the Nylon bolt and nuts, this is something of a fiddly job, but can be achieved - long nosed pliers help!

All the now remains is to provide a suitable box to house the interface unit, and this can be from one of the wide range available from sources such as Maplin or Tandy. Howes' instructions show an ideal method of mounting the p.c.b., using two long bolts through the front panel of the case. Whichever style of case is chosen, it is worth making a provision for anchoring the ends of the two coaxial cables, and thus eliminating stresses on the soldered connections.

Indeed, this should be done as soon as possible after making the connections, since coaxial cable is fairly stiff and a broken connection can easily occur. Plastics 'P' - clips, which hold the cable tightly, can be fitted over the mounting bolts and retained with two extra nuts. These will hold the cable very effectively close to the point at which it is soldered to the board. A small toggle switch, matching the one fitted to the interface, and used to switch the d.c. supply to the board, might be a nice extra touch, and would lessen the chance of flat batteries!

Finally, connect a suitable 12V d.c. supply, observing correct polarity, and noting the remarks in the review above. Good listening! ■





YOU'LL NEVER

ICOM

IC-R9000 (£4950.00)
(100kHz-2GHz, all mode)
10% deposit @ £495.00, then
36 months interest free @ £123.75

IC-R7100 (£1395.00)
(25MHz-2GHz, all mode)
15% deposit @ £209.70, then
18 months interest free @ £65.05

IC-R100 (£629.00)
(50KHz-1.8GHz, AM/FM)
10% deposit @ £65.00, then
12 months interest free @ £47.00

IC-R72E (£859.00)
(100KHz-30MHz, all mode)
10% deposit @ £91.00, then
12 months interest free @ £64.00

IC-R71E (£1059.00)
(100KHz-30MHz, all mode)
15% deposit @ £159.00, then
12 months interest free @ £75.00

IC-R1 (£395.00)
(2MHz-905MHz, AM/FM)
10% deposit @ £39.95, then
9 months interest free @ £39.45

YUPITERU

YUPITERU MVT7100 (£399.95),
(500KHz-1650MHz, all mode)
10% deposit @ £39.95, then
9 months interest free @ £40.00

YUPITERU MVT7000 (£289.95),
(500KHz-1300MHz, AM/FM)
10% deposit @ £28.95, then
6 months interest free @ £43.50

YUPITERU MVT8000 (£369.95),
(8MHz-1300MHz, AM/FM)
10% deposit @ £36.95, then
9 months interest free @ £37.00

YAESU

FRG100 (£529.00)
(500KHz-30MHz, SSB/CW/AM)
FM optional.
10% deposit @ £53.80, then
9 months interest free @ £52.80

FRG9600 (£589.00)
(60MHz-905MHz, AM/FM)
10% deposit @ £61.00, then
12 months interest free @ £44.00

AOR

AOR AR3030 (£699.00)
(300KHz-30MHz, All mode)
15% deposit @ £105.00, then
12 months interest free @ £49.50

AOR AR8000UK (£449.00)
(500KHz-1.9GHz, All mode)
15% deposit @ £66.50, then
9 months interest free @ £42.50

AOR AR3000A (£949.00)
(100KHz-2.036GHz, All mode)
15% deposit @ £142.00, then
12 months interest free @ £67.25

AOR AR1500EX (£349.00)
(500KHz-1300MHz, All mode)
10% deposit @ £35.80, then
9 months interest free @ £34.80

AOR AR2000 (£299.00)
(500KHz-1300MHz, AM/FM)
10% deposit @ £30.00, then
9 months interest free @ £29.88

KENWOOD

KENWOOD R5000 (£999.95)
100KHz-30MHz, (All mode)
10% deposit @ £99.95, then
18 months interest free @ £50.00

KENWOOD R5000+VC20
(£999.95 + £199.95)
(100KHz-30MHz & 108MHz-174MHz,
All mode) 10% deposit @ £119.95, then
18 months interest free @ £60.00

COASTAL COMMUNICATIONS

AMATEUR RADIO FOR THE RADIO AMATEUR

19 Cambridge Road, Clacton-on-Sea, Essex CO15 3QJ

VISA, ACCESS, AMEX, RSGB, DELTA, SWITCH, Licensed Credit Brokers

MON-SAT 9-5pm
WED 9-2pm
01255 474292

KNOW WHAT Y

Receiver Bargai

LOWE

Antennas & Accessories, SW, VHF & UHF Accessories may be added to scanner purchase value & included on financial agreement.
½ size G5RV for 10, 15, 20 & 40Mtrs £16.95 51'.0 Full size G5RV for 10, 15, 20, 40 & 80Mtrs £18.95 102' Double size G5RV 10-160Mtrs £32.95 204'

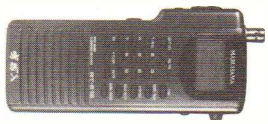
HF-150 (£389.00)
(30kHz-30MHz)
SSB/CW/AM/DATA
10% deposit @ £38.00, then
9 months interest free @ £39.00

HF-225 (£479.00)
(30kHz-30MHz, all mode)
10% deposit @ £47.00, then
9 months interest free @ £48.00

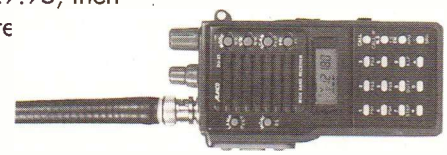
HF-225 Europa (£699.00)
(30kHz-30MHz, all mode)
Deposit @ £63.00, then
12 months interest free @ £53.00

HF-150/PR150/SP150/ RK150/RK150E
(£892.90)
Deposit @ £82.90, then
18 months interest free @ £45.00

Maruhama RT-618 (£299.00)
(500kHz-1300MHz, all mode)
Deposit @ £29.00, then
9 months interest free @ £30.00



ALINCO **DJ-X1D** (£299.95)
(200kHz-1300MHz, AM/FM)
Deposit @ £29.95, then
9 months intere
@ £30.00



REALISTIC

PRO-2035 (£349.00)
10% deposit @ £35.00 then 12 months interest free @ £26.16

25–1300MHz FM/AM

PRO-43 PACKAGE (£297.45)
6.6MHz–999MHz (with GAPS)
PRO-43 £229.95
UK SCANNING DIR. £17.50
SKY SCAN DX V1300
discone £49.95
10% deposit @ £30 then
9 months interest free @ £29.71

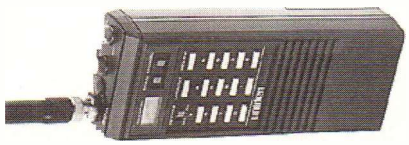
PRO-44 PACKAGE (£279.19)

PRO-44	£129.95
UK SCAN DIRECTORY	£17.50
SCAN MASTER DOUBLE DISCONE	£59.95
SKY SCAN MOBILE MAGMOUNT	£24.95
MOBILE CLIP & DESK MOUNT	£29.50
CLIP-ON MINI SPEAKER	£7.99
10M CABLE & PLUGS	£2.95

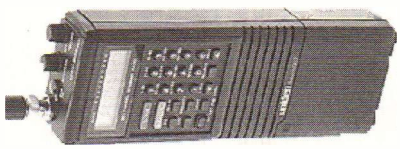
10% deposit @ £28.00, then
9 months interest free @ £27.91

BEARCAT

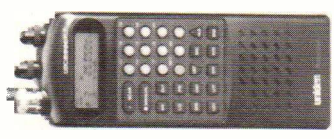
UBC65XLT (£99.00)
66-512MHz (with GAPS) FM



UBC220XLT (£199.00)
66-956MHz (with GAPS) FM/AM



UBC2500XLT (£299.00)
68-1300MHz (with GAPS)
10% deposit @ £30 then 9 months interest free @ £29.88



OU'RE MISSING

ns. 0% Finance.

If you're between 18-70 years of age working, retired or disabled, subject to status, you may well qualify for our new special interest free finance. For fast mail order, phone today for your forms.

Coastal Communications are main dealers for Kenwood, Yaesu, Icom & Hustler, we can offer a FAST NEXT DAY DELIVERY on most items. For polite, efficient & fast service call "Coastal". - the traditional retailer -

CHECK THE COMPETITION!

HUSTLER®

THE No1 ANTENNA SYSTEM IN THE STATES, THAT'S CATCHING ON VERY WELL OVER HERE. SEND AN A4 SAE FOR LATEST FULL INFO PACK INCLUDING HRT & PW REVIEWS. WHEN THE SIGNAL MATTERS USE HUSTLER.

MFJ-1278B MULTIMODE TNC + PC compatible software. Pactor, colour SSTV, Fax, Packet, Amtor, RTTY, ASCII, Navitex, CW. £409.90 10% deposit @ £40.99, then 12 months interest free @ £30.74

GLOBAL AT-2000 S/Wave Rx ATU 0.5MHz–30MHz coverage. Band selector switch thru/coopler selector Q selector **£99.95** rrp

DSPII AUDIO FILTER CW bandpass filters HF packet RTTY, SSTV, filters, SSB notch filters **£299** 10% deposit @ £30.00 then 9 months interest free @ £29.88

OPTO ELECTRONICS

OPT-3000 (£369.95)
frequency counter 10Hz–3GHz
10% deposit @ £36.99
9 months interest
free @ £36.99

FULL RANGE AVAILABLE

Hustler 6BTV Vertical £179.95
for 10, 15, 20, 30, 40 & 80Mtrs – 25' 1"

Hustler 5BTV Vertical £160.95
for 10, 15, 20, 40 & 80Mtrs

Hustler 4BTV Vertical £142.95
for 10, 15, 20 & 40Mtrs

Hustler discone £32.95
40-999MHz

Comet mobile scanning antenna £75.00
with 25dB pre-amp 0.5-1300MHz

Homebase stand for scanners/handhelds £19.95

Mobile stand for scanners/handhelds £9.95

Jim M-75 Scanner pre-amp £99.95

Single discone £54.95

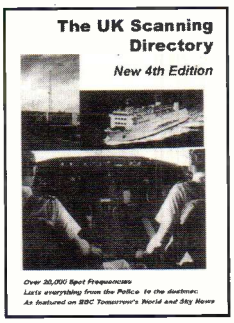
Double discone £69.95

Shortwave International Frequency Handbook £13.95

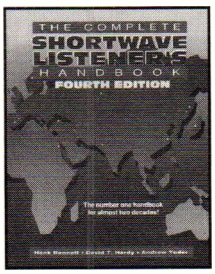
100 SWL UK QSL Cards £4.95

SWL Log Book £3.25

Scanner soft cases ..... *from* £16.95
most models available

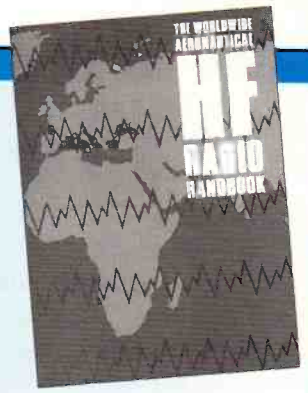


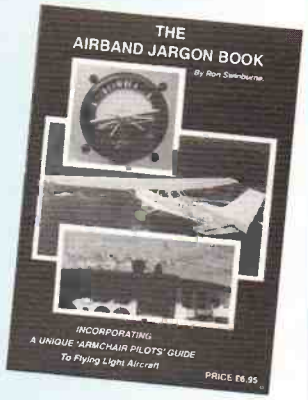
4th Edition UK Scanning Directory (£17.50)

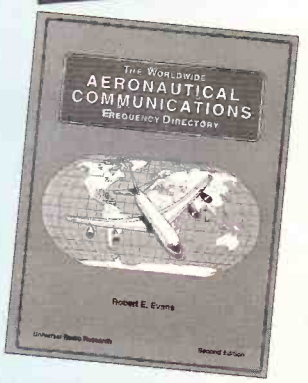


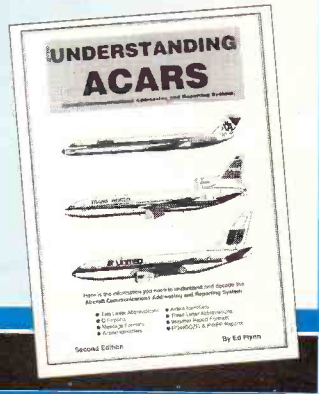
The Complete Shortwave Listeners Handbook (£23.95)

FURTHER AIRBAND READING









If you want to find out more about airband related subjects then the books mentioned on this page will help you.

The Worldwide Aeronautical HF Radio Handbook
Martyn R Cooke
124 pages
Available from the *SWM* Book Service £6.95 plus P&P.
This book sets out to list h.f. frequencies used by aircraft and aeronautical ground stations. To make the book simple to use it is divided into sections, each dealing with a particular subject - military, civil, etc. Brief explainations of each service as well as frequencies are given.

The Airband Jargon Book
Ron Swinburne
72 pages
Available from the *SWM* Book Service £6.95 plus P&P.
Intended to give the newcomer to airband listening some guidance on what to expect and how to get the best from airband, this new and expanded version now has an inbuilt *Armchair Pilot's Guide* to give the reader some insight into the flight instrumentation of a light aircraft and what it's like to fly one.

Air Band Radio Handbook 5th Edition
David J Smith
190 pages
Available from the *SWM* Book Service £8.99 plus P&P.
The author is an Air traffic controller by profession and in this fully revised and updated version of this popular book he explains the intricacies of air traffic control, its jargon, how to listen and what type of radio is needed. Comprehensive, up-to-date lists of h.f., v.h.f. and u.h.f. airband frequencies are given and the book is full of useful information.

The Worldwide Aeronautical Communications Frequency Directory
260 pages
Robert E Evans
Available from the *SWM* Book Service £19.95 plus P&P.
This book covers aeronautical radio communications, both voice and digital, within the h.f. and v.h.f./u.h.f. bands. Commercial, military and para-military operations are all covered.

Understanding ACARS Second Edition
Ed Flynn
80 pages
Available from the *SWM* Book Service £9.95 plus P&P.
This book gives you the information needed to understand and decode the Aircraft Communications Addressing and Reporting System - known as ACARS. The equipment needed to receive and decode ACARS transmissions is described along with descriptions of some of the currently available units.

To order your books please use the form on page 91.

A Flight by 747

Colin Goodall describes a flight to Boston Mass., from London Heathrow from the vantage point of the flight deck of a Boeing 747.

Boeing 747 in flight. *Courtesy of British Airways plc.*

We join proceedings with the aircraft at Gate 6, Terminal 4, as the last few passengers are boarding. The first officer checks with the ground staff via the telecom connections that all cargo doors are now closed.

A glance across the indicators shows all green thus confirming the ground staff report.

The internal 'phone rings and the senior cabin officer confirms all passengers have boarded and that the Redcap is approaching the flight deck. Details of passengers and cargo are accepted as loaded and signed accordingly. As the Redcap leaves and all doors are closed and locked, we call Delivery (121.975)MHz to confirm our routing for departure. All is OK and we call Ground (121.900MHz) for permission to push back.

We have copied the departure information from the ATIS on 133.075MHz which has given us the wind direction of 243° and speed of seven knots and confirmed the take off runway to be 27R.

We push back and start number one engine, all indications are good as the fan spools up. We continue with engines 3, 2 and 4. We listen out on 121.900MHz for taxi instructions.

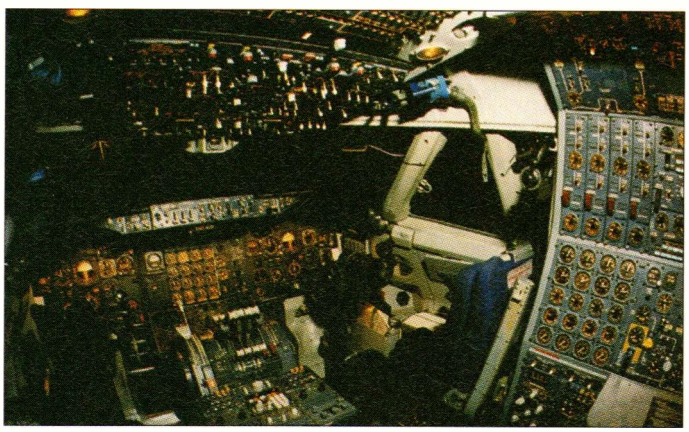
All flights are using runway 27R for take off and this is also confirmed in our clearance from Ground Control. Our clearance is to take off from 27R on a Compton 2F Standard Instrument Departure.

The ground crew confirm all clear and the tug has been unhooked and moved off. The telecom link is unplugged beneath us. We receive from Ground Control permission to taxi to Block 88 and hold. We start to taxi.

The Captain announces to the cabin crew to put all doors onto automatic, this refers to the automatic inflation and deployment of the escape chutes if the doors are now opened.

On reaching the holding point at block 88 we have to wait for a landing aircraft before we can cross the runway 27 left. We are cleared to cross 27L and continue our taxing to Block 92. During the taxi we check all controls and instruments and undertake final checks. We tuned to the tower on 118.500MHz in order to cross 27L and as we reach block 92 we advise the tower "SWM 002 ready for take off".

Immediately, on contact with the tower we are given permission to enter the runway, line up and hold. We turn gently onto the runway and line up with the brakes held on. A glance across the screens in front of us and at the instruments confirms all systems are working as we call the tower for permission to take off. "SWM 002 cleared for take off, wind 250 at 10 knots".



Boeing 747 'Classic' cockpit. *Courtesy of British Airways plc.*

Take off

With his right hand, the captain opens all four throttles and as the engines spool up, our first officer calls, "engines stable". The captain presses the button between the levers which puts the throttles onto auto and with only a short pause the levers are moved automatically forward to give full power from the four Rolls Royce engines. Steering is by foot control of the front wheels until we have enough speed to make the rudder effective.

We gather speed, checking all the time for direction and increase in speed. It seems very slow as we proceed towards our required speed for take off. At 175 knots we rotate and pull the aircraft gently off the runway and into the air. Positive climb is confirmed, we retract the gear and allow this 400 tonne giant to gently climb at 1000 feet a minute. We do not need the full power of the four engines, in fact we usually only have to use 75% of the available power.

We continue on the runway heading until we intercept the 260° radial from the LON VOR (113.6MHz). The tower calls and gives us our take off time and tell us to now call London on 123.9MHz.

The automatic pilot is engaged and as we roll out of the turn onto our heading, the flaps are retracted. We report

to London Control on 123.9 "SWM 002 on Compton 2F departure passing 1500". We continue on the heading of 260° until we are seven miles from LON and we turn onto 273° towards the Woodley beacon (l.f. 352kHz).

World Database

The whole journey has been set up in the on-board computer by selecting each of the way points and navigation beacons we wish to steer by on the journey to Boston. The computer has within it the full Jepperson database for the whole world. This contains every beacon, airway, airport and reporting point. Any additional or special waypoint can be entered through the keyboard using latitude and longitude. The database is updated every four weeks.

The automatic pilot now steers the plane in accordance with the programmed route and control the engines, to give us the necessary power to climb to 4000 feet as we pass Woodley and to be at 6000 feet as we pass Compton (114.35MHz).

The speed is now 225 knots indicated and we have extinguished the seat belt lights. For the next hour we can expect a gentle climb to cruising level as we make our way towards Ireland.

As we settle into the routine, the first officer now calls Shanwick Oceanic (127.65MHz) to confirm our Oceanic clearance. The requested route as filled in our flight plan is confirmed and we are to enter the Shanwick Oceanic Area at 53N 15W, our route then continuing via 53N 20W, 53N 30W, 50N 40W, 48N 50W to Torbay.

Whilst this has been happening, the captain has continued the radio contact with London and has changed to 132.8MHz and accepted a climb to flight level 120. That is 12000 ft. On passing 6000ft we reset our altimeter to the international standard of 1013.2mB.

We continue westward with course corrections from ATC as they guide us onwards and upwards giving us further clearances to climb FL 180, FL 220 and finally FL 330 which will be our cruising level over the Atlantic. Between Compton and Brecon (117.450MHz) we changed to London Control on 133.6MHz and join airway Upper Golf 1 (UG1).

Passing Strumble (113.1MHz) we call Shannon Control (134.275MHz) and join their airspace at Slany which is halfway across the Irish Sea. We are still on UG1 and steering 294° to Colonmel (l.f. 387kHz) and Shannon (113.300MHz).

As we pass Shannon the controller tells us that during the crossing we are to report to Shanwick Oceanic Control on 5.598MHz (h.f. u.s.b.) with 8.906MHz as our secondary frequency. All of our steering and tuning of beacons has been done by the computer automatically, now with a final fix on Shannon (113.3MHz) and Cork (114.6MHz) the computer will revert to internal navigation.

We head out into the Atlantic and give Shanwick a call on 5.598MHz to make sure they can hear us and we can hear them! There have been times when we have flown the Atlantic and no one has heard us at all until we called Gander on v.h.f. In those circumstances you just follow the cleared flight plan route very carefully.

The over sea part of the flight is uneventful, we report position at 20W on h.f. to Shanwick and at 30W and 40W we report to Gander Oceanic also on 5.598MHz. Reception is acceptable.

Increased Workload

At 50W we call Gander on v.h.f. 133.9 and the computer has found and tuned the Nav radios to Torbay (113.500MHz) and Gander (112.700MHz). Our programmed route takes us towards Sydney (114.9), Halifax (115.1), Yarmouth and Boston (112.700MHz). During this phase of the flight we have been speaking to control at Gander, Moncton and now Boston. We have commenced our descent and are now approaching Tusky reporting point at FL 120 at a speed of 250 knots. The workload gets quicker now.

The weather report is as expected (ATIS 135.0) with variable wind and a temperature of 11°C. We have requested to land on runway 33L as this leads directly to the International Terminal. Our descent continues and our speed decreases as we draw nearer to the final approach point. We have turned on the seat belt lights and stowed all loose items on the flight deck.

We are transferred from Approach (118.25MHz) to the Tower (128.8MHz) as we turn at 3000 feet at Cohas and intercept the ILS for 33L (110.7). We are also tuned to the outer marker beacon at Hullz (l.f. 346kHz) which is 4.5 miles from the threshold. We pass 1500 feet over Hullz. Our altimeter is set for the local QNH thus giving us a reading of 16 feet a.s.l. when we land. We lowered the landing gear as we joined the ILS and reduced speed to 160 knots with 20° flap.

The autopilot can land the aircraft without any help from us, but it has been decided that the First Officer will take over for a manual landing.

We're There

The final checklist is complete and as we approach 1000 feet the First Officer disengages the automatic pilot and takes control. The 747 is now in the hands of this one (very experienced) person who control the speed by small adjustments of the throttles and the descent by small adjustments of the elevator. The decision height is 200 feet and with a clear view of the runway ahead, the decision is taken to land. We glide down with the radio altimeter calling the height, hundred, fifty, thirty and exactly on the touch down markers we gently kiss the ground as the First Officer closes the throttles and flares so that we land on the full 16 wheel undercarriage and not on the two front wheels. Reverse thrust and automatic breaks bring the speed down quickly and we taxi gently to holding point N and join the North Inner taxi way for the International Terminal. Ground (121.9MHz) have confirmed our gate as number 4 and we gently approach following the marshal's instructions.

As we taxied, the Captain has announced to the crew to put the doors onto manual and we come to a full stop at gate 4, Logan International. We close down the various systems and are connected to the ground power supply.

We have travelled safely and comfortably some 3400 miles in seven and a half hours and within three hours this plane will be heading back to London full of passengers and freight. But then, at a cost of $125 million each, such an aircraft needs to be in the air for a minimum of 20 hours each day to earn its keep.

The crew hand over to the ground staff and to the new crew who will take our 747 back to London. We are off to our hotel for a good rest. It's goodbye Boeing 747 and Hello Boston. ■

Abbreviations

ASL	Above sea level
ATIS	Air Traffic Information Service
BOS	Boston
FL	Flight level
HF	High frequency
ILS	Instrument Landing System
LHR	London Heathrow
LON	London
MF	Medium frequency
NAV	Navigation
USB	Upper side band
VHF	Very high frequency
VOR	VHF Omni range beacon

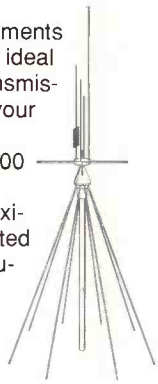
S.R.P. TRADING

SKY SCAN
Magmount MKII

For improved performance, wide band reception, 25 to 1300MHz. Comes complete with protective rubber base, 4m RG.58 coax cable and BNC connector. Built and designed for use with scanners.

£24.95
+ £3.00 p&p

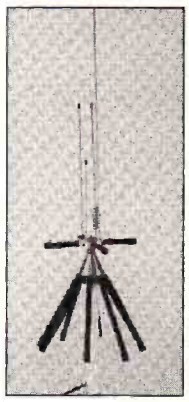
SKY SCAN
DX V1300 Discone



Most discones only have horizontal elements and this is the reason that they are not ideal for use with a scanner. Most of the transmissions that you are likely to receive on your scanner are transmitted from vertically mounted antennas. The Sky Scan V1300 discone has both vertical and horizontal elements for maximum reception. The V1300 is constructed from best quality stainless steel and aluminium and comes complete with mounting pole. Designed and built for use with scanners.

£49.95
+ £3.00 p&p

SKY SCAN
Desk Top Antenna Model Desk 1300



Built and designed for use with scanners. Coverage: 25 to 1300MHz. Total height – 36ins – 9ins at widest point. Comes complete with 4 metres of RG58 coax cable and BNC connector fitted.. Ideal indoor – high performance antenna and can also be used as a car antenna when your car is static. REMEMBER YOUR SCANNER IS ONLY AS GOOD AS YOUR ANTENNA SYSTEM!

£49.00 + £3.00 p&p

GrundigYacht Boy 500

40 Memory channels with RDS • 1.6 - 30MHz • full s.s.b • complete with P.S.U & carrying case

£189.95 + £5 p&p

Grundig Satelitt 700

TOP OF THE RANGE RECEIVER 1.6 - 30MHz complete with P.S.U, RDS • full s.s.b. • up to 2048 Memory channels

£349.99 + £5 p&p

GrundigYacht Boy 400

40 Memory Channels • Signal meter & carrying case • 1.6 - 30MHz • full s.s.b.

£129.95 + £5 p&p
FREE S.W. ANTENNA worth £14.99

AOR AR8000
The elusive one. Ring for details.

NEW 4TH EDITION UK SCANNING DIRECTORY
£16.95

Clip-on Mini Speaker
Ideal for portable scanners. Swivel clip attaches to your collar or lapel for easier listening while you carry your portable on its belt-clip. With 3.5mm plug.

£7.99 + £1.00 p&p

PRO-44
50 Channel Scanner
66-88, 108-136.975(AM)
137-174,
380-512MHz

inc NiCads and charger worth £20

£129.95 + £5 p&p

Telescopic scanner antenna
Extends portable scanner range. Nine sections, centre loaded. For 1–1300MHz. BNC connector.

£8.99 + £1 p&p

PRO-43
200 Channel Scanner
10 Monitor Channels
£229.95
+ £5 p&p

inc NiCads and charger worth £20

MVT 7100
Specifications
- NFM / WFM / AM / LSB / USB
- 530 kHz – 1650 MHz
- 1000 memory channels
- 500 search pass frequencies
- 10 search bands
- 30 channels per sec. scan speed
- 12v d.c. or 4 x AA power supply
- Back-lit l.c.d. & buttons

RING FOR THIS MONTHS SPECIAL PRICE

New Carry Case for

PRO-44	COM 204
PRO-43	COM 203
PRO-39	COM 202

£14.99 + £1 p&p

PRO-2006
Special part exchange deals on PRO-2006E, PRO-2035
RING FOR DETAILS

VISA

Mail Order: SRP Trading, Unit 20, Nash Works, Forge Lane, Belbroughton, Nr. Stourbridge, Worcs. Tel: (01562) 730672. Fax: (01562) 731002
Shop: SRP Radio Centre, 1686 Bristol Road South, Rednall, Birmingham B45 9TZ. Tel: 0121-460 1581/0121-457 788

Access

A REAL BASE STATION SCANNING RECEIVER

1000 channel with hyperscan

£349.99 Free P&P

- **1000** memory channels (100 channels x 10 banks)
- **10** limit search banks
- **100** monitor channels
- **Accessory:** Telescopic antenna and owner's manual
- **Display:** Large l.c.d. with l.e.d. backlighting
- Large **rotary** or **keypad** frequency control
- **Dimension:** Approx 232 (W) x 210 (D) x 90 (H) mm
- **Receiving wave mode:**
  - Wide f.m. ➤ TV sound, ➤ f.m. broadcast
  - Narrow f.m. ➤ Business, ➤ Communication, ➤ Ham radio
  - a.m. ➤ Aircraft, ➤ CB radio
- **Scan and search speed** Approx 50 channels/sec. and 50 steps/sec.

Very special part exchange deal available on this radio

PLEASE RING FOR DETAILS

FREQUENCY RANGE AND MODE:

Freq (MHz)	Step	Mode
25.000-29.995	5.0kHz	a.m.
30.000-87.495	5.0kHz	n.f.m.
87.500-107.995	50.0kHz	w.f.m.
08.00-136.995	12.5kHz	a.m.
37.000-224.995	5.0kHz	n.f.m.
225.000-400.000	12.5kHz	a.m.
400.005-520.000	12.5kHz	n.f.m.
760.000-1300.000	12.5kHz	n.f.m.

Available now from: **SRP TRADING**

Mail Order
SRP Trading, Unit 20, Nash Works,
Forge Lane, Belbroughton,
Nr. Stourbridge, Worcs.
Tel: (01562) 730672
FAX: (01562) 731002

Shop
SRP Trading, SRP Radio Centre,
1686 Bristol Road South, Rednall,
Birmingham B45 9TZ.
Tel: 0121-460 1581/0121-457 7788
FAX: 0121-457 9009

Taking the Flight

"Mayday! Mayday! Mayday! London Centre, Golf Alpha Sierra Whiskey Mike, Cessna 150, engine failure, ditching, 1 mile east Lowestoft at 3000ft, heading towards coast".

Godfrey Manning G4GLM has taken the Flight Radio Exam and knows what to do.

Not for real, you understand - but had it been, then my training would have enabled me to put out this most vital of radio transmissions whilst concentrating on the job in hand - flying the aircraft. There is a saying in flying that can be adapted to any circumstances where a moving vehicle is under manual control - 'Aviate, navigate, communicate'. Despite the failure of its single engine, the aircraft won't drop out of the sky, but will glide gracefully towards the surface provided that the pilot concentrates on keeping it under control at the correct airspeed.

You can see why the Urgency (Pan) and Distress (Mayday) calls are given such high priority when taking the exam for the CAA Flight Radio Telephony Operator's Licence.

What Qualification Do I Need?

What is the exam for and how do you go about it? Anyone may fly a light aeroplane, but without a pilot's licence you can't take passengers on your own. When you turn up at your local flying club for a trial lesson, you will take control of the aircraft; you won't have a licence but you will take something far more useful with you - an instructor. Provided the club or school holds an Air Operator's Certificate, provided you pay the entire cost of the lesson yourself and assuming there's a spare seat, you may even take a friend along as a passenger because the licenced instructor is always ultimately the Pilot In Command. You won't be allowed to talk on the radio, though.

Once hooked, you'll obtain a Student Pilot's Licence and start your lessons. Without any further qualification, you will suddenly find yourself permitted - and even required - to talk on the radio. Forty flying hours and much hard work later, you pass the General Flying Test and along comes your 'full' Private Pilot's Licence. And, all of a sudden, you're banned from transmitting again! Operating the radio now requires that separate Radio Operator's Licence.

You can take the exam, and having passed, pay for your licence, whenever you like. You don't even need to be a pilot or hold any licence or be taking any lessons! Many years ago, long-haul airliners carried non-pilot radio operators. However, there's little chance of passing the radio exam without extensive aeronautical knowledge. To find the nearest exam centre, AIC 101/1993 refers - but up-to-date information is held by the CAA, telephone 0181-745 3456. There are fees for both the test (payable to the flying school at the time) and for the licence (payable on application to the CAA).

Types of Air Traffic Control

A bonus is the ability to operate a ground station. On applying for the Flight Op's Licence, you can also obtain a Certificate of Competency for ground operations. Before you walk in to the control cabin at your local airfield, though, you will need the Certificate to be signed by whoever holds the Radiocommunications Agency's licence for the aerodrome transmitter. This is a bit complicated - the RA license the operation of the transmitter, but the CAA certify the activities of the person doing the transmitting!

There are three levels of 'controller', only one of whom is actually in control, causes confusion. With your Certificate you may only operate an Air/Ground station. These are typical of light fields and there is no element of control. The aircraft are obliged to call the operator for a friendly chat about the weather and other traffic - but the operator can't issue instructions, only advice. If the operator says "Golf Whiskey Mike, runway obstructed, go-around", but the approaching aircraft still lands, it's entirely the pilot's responsibility if anything goes wrong.

Flight Information (FIS) is the next level up in the hierarchy, and you can only operate this sort of station if you pass yet another exam. Some middle-sized aerodromes offer this service in the UK but in most other countries it is the standard service even at light aerodromes. There actually isn't much difference between Air/Ground and FIS, even the FIS Officer can't issue controlling instructions. However, it is permissible to transmit clearances issued by another authority. An example would be an instrument-equipped aircraft departing a light field but intending to join a controlled airway later in the flight. The FIS Officer could telephone the Air Traffic Control Centre and file an airways flight plan, obtain a clearance for joining the airway and read this to the pilot who might by now be waiting to take off.

Don't forget the true controller who is in charge of controlled airspace either at a major airport, or in designated airways, often assisted by radar. This is a separate qualification.

The Exam Itself

To prepare for the exam, you need a thorough knowledge of the *Radiotelephony Manual CAP 413* available at a reasonable price from CAA Printing and Publication Services, Greville House, 37 Gratton Road, Cheltenham, Gloucestershire GL50 2BN. Tel: (01242) 584139. Before doing the exam proper, my instructor took me through some of the main points and made me recite a typical Mayday call. Next comes the written paper, mostly multiple choice. However, you have to write the text of a typical Mayday or Pan call - and you must get it just about right!

Now the fun starts. To simulate flying conditions, you and the instructor don headsets connected through an amplifier. Aided by a map, and staying firmly rooted to your desk, you pretend to guide your flight along the planned route. At various

Radio Exam

Abbreviations

AIC	Aeronautical Information Circular
CAA	Civil Aviation Authority
ft	feet
h.f.	high frequency
nm	nautical miles
v.h.f.	very high frequency

times there will be changes of frequency and squawk codes. The squawk is a four-digit number that you set on the aircraft's secondary surveillance radar transponder. Although this sounds dreadfully complicated, the name is worse than the deed itself. Just dial up the number that the controller tells you, and then the controller will see that number come up on the radar right next to the dot representing your aircraft.

One of the calls I had to make was to a v.h.f. radio direction-finding station (VDF or Homer). "Broadstone Homer, Golf Alpha Sierra Whiskey Mike request QDM". With modern equipment, this transmission will be long enough for the VDF station to take a reading, and the pilot must read back the given bearing. QDM (remembered, unofficially, as 'Direction Magnetic') is the heading that the aircraft should steer to get to the VDF station if there were no wind.

Guess what happens at the end of the practical test? The instructor tells you you've got an emergency and you have to send a Pan or Mayday call! If you've done everything correctly, you'll become the proud possessor of a pass slip and licence application there and then. I would point out that h.f. operations require a further exam and licence endorsement, but unless you're planning to fly across the Sahara or Atlantic you probably won't want to bother.

Procedure

There's no reason why the average airband enthusiast who reads this magazine couldn't tackle the exam and obtain a licence. Most readers, though, won't want to go through all this but will probably just want to learn more about what the radio procedures mean. *The Radiotelephony Manual* is good value and a useful reference.

Some general points about radio procedure do come out during the exam and in real life. For example, never say "Yes" or "No". This is why, when Chris (my t'other half) asks me anything, she often receives "Affirm" or "Negative" in reply! People who spend much time speaking on communications radio are often identifiable in everyday life by their precise turn of phrase and annunciation.

Numbers are pronounced in an exaggerated way, the emergency frequency being "One Two One Decimal Five" or, as the textbook has it, "Wun Too Wun Dayseemal Fife". Letters are always spoken by the phonetic alphabet, the aircraft callsign above being G-ASWM (G for Golf, A for Alpha, etc.). Once communication has been established, the controller might abbreviate the callsign to "Golf Whiskey Mike" (but not just plain "Whiskey Mike" which is unofficial). This means that the controller knows that there isn't another 'WM on frequency and the pilot may copy this abbreviated form.

On first contacting a new authority, say the aerodrome of arrival, it is usual to include position, heading and altitude (PHA! to you). "Broadstone, Golf Alpha Sierra Whiskey Mike, Cessna 150, one five miles north of your field, heading one eight zero, altitude two five zero zero QNH one zero one two, request joining instructions". It is rare to need to say "Over" these days, unless the quality of the communications link is poor.

The QNH is the pressure to which the altimeter is set so that it reads correctly after compensating for the air pressure caused by the day's weather. The altimeter will then show height above mean sea level. This is useful since all the charts show terrain in this way too, so you can soon tell if you're safely above the nearest high ground - or about to fly into it! On approach, the QFE setting - as stated by the controller - makes the altimeter read height above the aerodrome so it will always read zero at touchdown, no matter whether the runway is up a mountain like Samedan, Switzerland (5600ft elevation) or down on a polder such as Lelystad, Holland (13ft BELOW sea level!)

Circuit Flying

In the case of light fields, much flying is done as a circuit for practice. The runway is defined by two digits, being the magnetic heading with the rightmost digit omitted. A westerly runway points towards 270° and is hence runway 27. Land in the opposite direction and it becomes 09 (easterly). Traffic flows clockwise (right-hand circuit) or, more usually, anti-clockwise (left-hand circuit). The latter is preferable since the commander, sitting in the left-hand seat, is afforded a view of the runway at all times.

The aircraft calls "Ready for departure" and only the controller is allowed to utter the word "Takeoff" so as to avoid confusion. Takeoff is into wind (correctly known as upwind). The circuit is actually a rectangular shape and the first turn takes the aircraft at right-angles to the runway so as to travel on the short crosswind leg.

Turning again, the aircraft is now flying parallel to the runway and in the opposite direction to the way in which it took off. The end of the runway soon appears over the pilot's shoulder or, to be precise, the aircraft is abeam the upwind end of the runway. The 'Downwind' call is made since the aircraft is going along the same direction as the wind - on the downwind leg.

The next turn is again onto a short leg, the base leg. One more turn lines the aircraft up with the runway and by flying ahead and descending a landing can be made. This is the final approach and so the pilot calls "Finals" (or "Long final" if more than 4nm out). It's not always possible to land - the runway might be blocked by another aircraft or the pilot might not be happy with the angle of approach or the gusting wind. A go-around can be initiated, in which case the aircraft climbs ahead back into the circuit (and it's advisable to shift slightly to one side of the runway, rather than flying directly over it, so as to keep it in view in case another aircraft does take off). For practice, a touch-and-go is where the aircraft lands, accelerates rather than stops, and climbs into the circuit again.

Most likely, though, the aircraft lands, taxis to the apron and the engine is shut down. This is a full stop landing and an appropriate place to end this article. ■

FREE FINANCE

No catch, no extended payment schemes - no interest! If you are in full time employment or retired/invalidity benefit then you can probably take advanage of our free finance option. Call or write today for details.

IF YOU DON'T WANT TO TAKE ADVANTAGE OF MY FREE FINANCE AND WOULD RATHER PAY CASH, CHEQUE, CREDIT CARD OR TRADE-IN, THEN CALL 0181 - 566 1120 TODAY FOR EXPERT ADVICE.

I promise you the best overall deal in the U.K. Get ringing, or you'll miss the bargains!

***Please NOTE prices & monthly payments are based on 17.5% VAT & no more price increases! E&OE**

Martin Lynch is a licensed credit broker. Full written details are available on request.

MARTIN

G4

THE AMATEUR RADI

NEW!

Keypad for the Yaesu FRG-100

When Yaesu launched their FRG-100 receiver at the Leicester show in 1993, there was one major feature missing - a keypad for frequency access. Available from MARTIN LYNCH, the new myDEL KP-100 is an instant access keypad for the Yaesu FRG-100 receiver. In addition to frequency entry, the KP-100 also allows entry of memories, "up and down" frequency shift and turning the set on and off.

The KP-100 is available at £44.95 incl VAT + £2.00 p&p.

Sprite Software for the Yaesu FRG-100

Introduced last year, the **Sprite FRG-100 Control software** has been an instant success for those who want a "user friendly" programme. Using your PC in conjuction with Microsoft Windows, SPRITE allows you to control your receiver from your P.C. Giving you endless memory banks, (depending on the size of your hard disc), including names to each channel, tune up and down, keypad frequency entry from your mouse and lots more.

Supplied with an RS232 interface, software disk and manual, £79.95 p&p £3.00

MARTIN LYNCH FOR SONY

SONY ICF SW100E - Small pocket all wave all mode (incl ssb) receiver. **£199.99**

SONY ICF SW7600G - All mode 22 presents, Synchronous detector receiver. **£179.99**

SONY ICF SW55 - All mode 125 presents, AC adapter incl. receiver. **£299.99**

SCANNERS

NEW !!! AOR AR2700

To replace the AR-2000, AOR have introduced this fantastic LOW PRICED scanner into the market. Completely restyled, larger display, NO GAPS, the new AR-2700 has a special feature that no other scanner holds- a DIGITAL VOICE RECORD FACILITY built into the receiver. Offered as an option, the user can press a button to instantly record a whole 20 seconds of audio, for playback at any time! Add to that a Data Port for computer control, (with the optional CU8232) and AOR, once again brings you a winner!

AR-2700 RRP £269, Voice module £39. **SPECIAL OPENING OFFER, by both for only £279, including delivery!**

AOR 3000A PLUS

Modified by the boys at AOR UK, the new 3000A plus provides even greater performance and capabilities. Five modifications including wider FM filter for WEFAX, 10.7MHz I.F. output for driving the SDU5000 plus more, the extra facilities are certainly worthwhile. The AR3000A plus is available from stock. RRP £949. **See special purchase offer with the SDU5000!**

AOR SDU5000

Designed primarily with the AR3000A in mind, the SDU5000 enable the user to "view" upto 10 MHz of the selected band selected on a LCD colour display. Even small signals can be seen with ease, making it invaluable for the serious VHF/UHF monitoring station.

AOR SDU5000. RRP £699

BUY BOTH THE AOR3000 plus and the SDU5000 for only £1529,

saving £119!!

Super low finance plan also available!

IMPORTANT NOTIC

5 Year UK Warranty for Sho

Twelve months ago, Lynchy was telling you why an extra 1 y blah, why don't we all give 10 years, blah, blah and loads m will approve of this one.

No joke. This is serious. Purchase a new piece of gear from Martin Lynch and he'll offer you the chance of a whole FIVE YEARS WARRANTY, covering parts & labour but excluding "dial lights"; (you mean you can't change a bulb??). In the event of a break down, the warranty also includes COLLECTION & DELIVERY on the U.K. mainland.

Furthermore, buy a USED piece of gear from him and he could offer you a staggering FIFTEEN months warranty. For the cynics amongst you, it does cost. But before you pooh-pooh it, think about this. Three chaps in February bought FT-1000's from him. All three wanted FIVE YEARS. (They probably got it when their wives saw the invoice). For less than the cost of ONE HOURS labour per year, they now have TOTAL PEACE of MIND. That new Dual Band

AR8000 UK

Designed for the world market, the AR8000 covers just about everything that is transmitted in the entire usable radio spectrum. The ONLY scanner to cover 500kHz- 1.9GHz in your hand, its been our best seller for some months now. Look at the special MARCH PRICE!! AR8000 RRP £449. **ML PRICE £385, saving £64!**

MVT7100

The "Ford Cortina" of all scanners, tens of thousands have been sold throughout the world. RRP £389. **Lynchy price = £????** Guaranteed UNBEATABLE!!

Bearcat UBC220XLT

The easiest to use, no- nonesense scanner from the worlds largest scanner manufacturer - BEARCAT! **RRP £199.**

NEW!!

ICOM IC-R7100HF GT

Up until now, the only way HF was possible on this excellent VHF/UHF receiver was to fit an internal "converter" using the set as a "tunable

ACCESSORIES - ALWAYS A MASSIVE SE

MLB-1 Magnetic long wire balun, eliminates noise off feed line ..... RRP **£44.95**

DATONG AD270/370 Active antenna that really work!
Indoors or outside..... RRP **£59.95/£79.95**

EAVESDROPPER The best made outdoor shortwave antenna. Built to last..... RRP **£89.95**

MyDEL MINIMAG PROSCAN
The latest MyDEL design, a mini magnetic antenna
100 -1000MHz. ..... RRP **£29.95**

MyDEL HELICONE
Specifically designed shortwave to 1300MHz outdoor antenna for handheld & base scanners,
using helical resonator & radials. ..... RRP **£59.95**

DIGITAL FILTERS - STOP UNWANTED NOISE - TRY A DSP FILTER TODAY

TimeWave DSP9+ Favourite of the RadCom team..... RRP **£239**
TimeWave DSP9. Budget version of the 9+ ..... RRP **£169**
TimeWave DSP59. All mode DSP..... RRP **£299**
JPS NTR1. The easiest to use DSP..... RRP **£199**
JPS NIR10. The ultimate all mode DSP..... RRP **£399**
Datong FL3 ..... RRP **£149**

24-HOUR B.B.S. LYNCHLINE IS NOW OPEN

By dialling 0181 - 566 0000, via your computer and modem, listings of my NEW & USED stock are available to view. You can place orders, leave queries on a particular product or just "browse" at your leisure. There is no "log-on" fee, no monthly subscription, bar the telephone call made to the shop. As the months go by, Product Reviews will be added together with SPECIAL OFFERS that I am not allowed to print in this magazine! If you haven't got a PC (or a suitable modem), then call us about the new German made "Peacock" range of commercial grade "Radio Ready" P.C's. They are excellent value and are offered with a two year warranty!

Yes I Would Rather Bu

N LYNCH
HKS
O EXCHANGE CENTRE

Officially appointed "Master Dealer" by YAESU U.K.

Master Dealer YAESU

0181-566 1120

140 - 142 NORTHFIELD AVENUE, EALING, LONDON W13 9SB

AFTER HOURS: 0973 339 339 FAX: 0181 - 566 1207 B.B.S.: 0181 - 566 0000

Access VISA AMERICAN EXPRESS RSGB SWITCH

CE TO ALL READERS

rt Wave & Scanner Products

ar warranty really wasn't necessary. Things are more reliable, blah, ore. You still persisted in asking for longer warranties so we think you

Handie you've just bought could have had FIVE YEARS WARRANTY for under £14 a year. Oh, and another thing. If you sell on your equipment before the FIVE YEARS has expired, the new owner can have the warranty transferred, at no extra cost. That instantly increases the "re-sale" value. Good isn't it? Think about it next time you buy a new or used piece of kit.
If you would like more details or have purchased equipment from MARTIN LYNCH within the last SIX MONTHS, then hurry. The extended warranty could still be available to you.

Telephone Jennifer on 0181 566 1120 and ask about the FIVE YEAR PLAN.

I.F.". After a considerable amount of research and design, Graham Tingey, our Chief Engineer, has developed a more positive solution. Without the use of any "after-fit" internal converters, Graham has reprogrammed the set to tune the entire range from 60kHz to 2GHz. As before, frequencies below its usual 25MHz are tuned by depressing the original dimmer switch, now re-labelled HF. Removing the converter board ensures greater stability, strong signal handling and sensitivity. The modifications are available to any customer already owning an ICR-7100 for only £199.95, including VAT & return delivery. (U.K. mainland). For customers wishing to purchase a new IC-R7100 with the HF "GT" conversion, the price is only £1489.00.
Available on FREE Finance. Deposit £529, 12 x £80.00, ZERO APR.

VT-225 & VT-125

These two twins are the very best for scanning the AirBand. The VT-225 covers both the Civil & Military frequencies and the smaller VT-125, Civil only.
VT-125 £179.95 VT-225 £229.95

LECTION AVAILABLE. CALL OR MAIL ORDER!

DECODERS AND DECODING SOFTWARE

ON DEMONSTRATION AT MARTIN LYNCH

Universal M400
Stand alone RTTY/SITOR/FEC/GOLAY/DTMF/CTCSS & ACARS DECODER ..... RRP **£399**

Universal M900
As per M400 but output to VDU + CW operation. No ACARS. ..... RRP **£529**

Universal M1200
Internal full-height "PCB" decoder for installing into PC. All mode ..... RRP **£399**

Universal M8000
The professional man's choice. VGA colour monitor required. ..... RRP **£1325**

AEA PK-232MBX
All mode TX/RX TNC. Hooks up to your PC. Easy to use. ..... RRP **£329**

AEA FAX II
Software driven decoder for WEFAX, RTTY & CW transmissions. ..... RRP **£139**

Lowe Modemaster
Data decode & control software for HF-150. Hook up to your PC. ..... RRP **£139**

Lowe Airmaster
Data decode & control software with PC interface ..... RRP **£89.95**

Lowe Synop
New! Decode complete weather maps ..... RRP **£149**

Kenwood R-5000

Still the best seling receiver and still no price increase!
Offered on FREE FINANCE, £99 Deposit, 12 x £75, **Total £999, and we will throw in a FREE CW or SSB Filter!**

Yaesu FRG-100

An easy to use shortwave receiver. Use our new KP-100 keypad and its even easier!
RRP £549, £69 Deposit, 12 x £40, plus FREE MyDEL KP-100 KEYPAD! (April only).

AOR-3030

A Japanese receiver with an American appearance, the AR-3030 is a real alternative to the normal layout of receivers. It works well too! **RRP £699, £99 Deposit, 12 x £50, plus FREE antenna!**

JRC NRD-535

If it came with all the options fitted at this price, we probably wouldn't sell anything else! The ultimate receiver.
RRP £1549, £499 Deposit, 12 x £87.50, plus FREE DATONG ACTIVE ANTENNA.

Lowe HF-225

The big brother of the HF-150. **Only £499, Deposit £99, 12 x £33.33**

Lowe HF Europa

An HF-225 with all the options, plus better AM selectivity, **RRP £699, £99 Deposit, 12 x £50, plus FREE antenna!**

Drake R8E

The Drake is my own personal favourite. It doesn't look or feel like a normal receiver, but the PassBand tuning and American designed filters win me over every time. If you can afford that little extra, then go for it!
RRP £1199. Deposit £179, 12 x £85.

Lowe HF-150 & "Friends"

The British "Quad" of Radio Communications, Lowe Electronics are flying the U.K. flag, thanks to the excellent value for money, advanced circuit design and overall packaging of their receiver range.
This month, Martin Lynch is offering the "HF-150 Stack", not only on FREE FINANCE, but offering an EXTRA ONE YEAR WARRANTY for every system ordered during March '95.

HF-150	**RRP £419**
PR-150	**RRP £235**
SP-150	**RRP £219**
Rack	**RRP £59.95**

Total Value £932.95
Deposit £132.95, plus 12 x £66.66.

"RADIO READY PC's"

PEACOCK

In January 1995, Peacock Computers appointed MARTIN LYNCH as their sole retailer of "RADIO READY" PC's for the Amateur Radio market. Buying a PEACOCK PC from Martin Lynch ensures that the system is configured for your application, making it simple to employ as an ever important accessory in the modern radio shack. If you have wanted to buy a P.C., but are bewildered at the market with lots of terminology that makes you feel like a beginner to Amateur Radio, then contact MARTIN LYNCH for advice on how and why you should have a PEACOCK P.C. in your shack - TODAY! All systems include a full TWO YEAR WARRANTY anywhere in the British Isles and are compatible with the entire range of AEA, KAM and other Packet and Data Decoding products.

CPU	486DX-40
Motherboard	VLB
Cache	256K
RAM	4MB
HDD	210MB
Controller	VLB
VGA card	SPEA VEGA PLUS
VGA Mem	1MB, VLB
FDD	3.5" 1.44MB
Keyboard	Yes - Cherry
Mouse	Yes - Logitech
Software	DOS V6.2, WFW V3.11
Monitor	14" SVGA Non-interlaced LD

Price Incl VAT, £995

CPU 486DX2-66
As 486-40, but 420MB Hard Disk.
Price Incl. VAT, £1099

CPU PENTIUM 60
The ultimate in Home P.C's.
As 486DX2-66, but 60MHz Processor, 540MB Hard Disk & 8MB RAM.
Price Incl VAT, £1495

All items are available on Low Cost Finance. Carriage extra at £20 per system. Please note: The 3 speed CD-Rom, 16-bit sound card and speakers shown in the photograph are optional extras costing £259.

uy From Martin Lynch!

Short Wave Air Band Listening

Airband listening, particularly on h.f. rather than v.h.f./u.h.f., can be very interesting, as Dick Moon explains.

The airbands offer probably more frequent and reliable transmissions for the utility listener than any other sector of the short wave utility spectrum, as at any given time, there are thousands of aircraft flying the myriad of defined air routes throughout the world. All of these aircraft are in frequent communication with ground stations and their transmission can readily be heard by listeners with receivers capable of side band reception.

What Can I Hear

Transmission in various modes may be heard on numerous frequencies, but the most common mode is voice transmission on u.s.b. These transmission cover such diverse areas as weather forecasts, aircraft/ground control, NASA Shuttle report, company aircraft operations, military aircraft communications and hurricane information. CW transmissions include navigational beacons, while RTTY handles mainly AFTN (Aeronautical Fixed Telecommunications Network) traffic. In addition with the aid of proper equipment, weather maps and press photos may be received by FAX transmission. Other interesting transmissions to listen for are VOLMETS. The word is derived from French and loosely means 'Flying Weather'. VOLMET stations are situated throughout the world, and transmit weather forecasts for airports within the area. They transmit at specified periods during each 24 hour period, and share frequencies with several countries in the same general area of the world.

Civilian Aircraft

Air to ground communications are readily heard, as all aircraft are required to contact the ground stations along their route at pre-determined intervals to report their position, and to provide certain other relevant information such as weather, temperature, fuel remaining, etc. All commercial land routes are covered by a grid of fixed points known as Waypoints, each of which is given a specific name. Thus by recording the time at which the aircraft is due to pass over any specific waypoint, an accurate track of the plane's flight may be obtained. When flying over the sea waypoint, names are fixed by latitude and longitude.

A typical message might be:

"SPEEDBIRD 127. Luanda on 03" (BA a/c calling Luanda on 8903kHz)

"SPEEDBIRD 127" (Luanda responding)

"SPEEDBIRD 127. IMEX zero one five five. Estimate VOTAR zero two one four. Flight level Three Two Zero. Winds Two Nine Zero Diagonal Six Three. Request level Three Five".

This reports that BA Flight 127 crossed waypoint IMEX at 0155, and anticipates reaching VOTAR at 0214. The flight level is 32000ft and the outside temperature is -30°C with a wind blowing from 290° at a strength of 63 knots. The Captain is also requesting a change of altitude up to 35000ft.

Luanda will repeat the message, and in due course will either give approval to the change of altitude or not, depending on the traffic in the area. It is quite possible, with patience, to follow the flight of an aircraft, say from London to Hong Kong, by tuning into the frequencies of the ground stations along its route, listening to the position reports and times, and plotting them on a map.

Very frequently, when listening to aircraft communicating with ground stations, a request for a SELCAL will be heard, and the response will be a four letter groups such as ALPHA DELTA HOTEL MIKE. This is a code which is issued to aircraft companies by Aeronautical Radio Incorporated (ARINC), a controlling body owned by the airlines.

Selcals are issued in blocks to aircraft companies, who then allocate them to their individual aircraft. The second and fourth letters in a Selcal are always higher in value than the first and third. For example AE-GK is correct, but not EA-KG, when A=1, B=2, C=3, etc.

The object of SELCAL is to avoid the necessity for an aircraft radio operator having to listen continuously for messages from the ground stations. If a station requires to contact a particular aircraft, the operator transmits the SELCAL latters, and a 'ding-dong' sound is heard on the flight deck and a warning light flashes to alert the flight radio officer.

LDOC (Long Distance Operational Control) stations can also provide interesting listening. These stations are operated by airlines or private companies for personal company operational information. The transmissions range from progress reports, maintenance problems, airport weather conditions to personal messages to or from the crew. LDOCs that are often heard are Springbok Jo'burg on 8.933MHz, Speedbird London (British Airways) on 5.535, 8.821, 10.072 and 13.333MHz. Stockholm Radio on 5.541, 8.930, 11.345, 10.066, 10.066, 13.342, 17.916 and 23.210MHz and Houston Radio on 6.637, 10.075, 13.330, 17.490 and 21.964MHz. It must be remembered that, as with all utility stations, transmissions are spasmodic and unpredictable, and considerable patience is required.

All countries are covered with a network of aircraft navigational beacons which transmit 2 or 3-letter identifiers using c.w. at frequent intervals. They may be heard at night, usually between 200 -450kHz and as the letters are transmitted very slowly, they are easy to decode and log.

Military Aircraft

All branches of the armed services make extensive use of s.w. radio for communications and activity in all modes may be monitored on the various bands. Most of the transmissions are by voice, and although the messages are usually cryptic, the location of the base station is normally given.

The US Airforce is probably the most prolific user of s.w. radio for communication, and a vast

amount of information is sent and received each day. Some code words to listen for are: MAC (Military Aircraft Command), EAM (Emergency Action Message), SKYKING (Do not answer message), SKYBIRD (US aircraft calling a ground station), MYSTIC STAR (Aircraft carrying a VIP). These latter are known as SAM (Special Air Mission) flights, and belong to the 89th Military Air Wing (MAW), operating out of Andrews Air Force Base.

The US Navy may also be monitored, but station identification is difficult as a system of alphanumeric identifiers is in use. There is one exception, and this applies to US Naval Air Stations, where the identifier used is RASPBERRY.

It is frequently possible to monitor MARS (Military Affiliated Radio Stations) and CANFORS (Canadian Armed Forces Stations). These stations broadcast the "Hello Ma, I'm fine" type of message and provide a link between service personnel and their families back in the USA and Canada. They operate on various frequencies but may often be heard between 14.408 and 14.470MHz during the evenings or early hours of the morning. At the present time there is considerable traffic from Somalia and Angola.

The RAF may also be monitored, with the VOLMET station at West Drayton being easily heard on 4.722 or 11.200MHz. Other bases which are often heard are 'HAVEN', Ascension Island', 'VIPER' (Falkland Islands) 'CYPRUS', 'GIBRALTAR' and 'ARCHITECT' (RAF Strike Command). The main frequencies in use are 9.032 and 11.234MHz. Code names to listen for are 'KITTYHAWK' (The Queen's flight), RAINBOW (Prince Philip's flight), UNICORN (Prince Charles flight) and ASCOT (RAF Transport Command).

At certain times of the day, what are known as NATO Colour Coded weather forecasts are broadcast, in which colours are used to indicate cloud base and surface visibility. For example, Blue indicates a cloud base of 3/8 or more at 25000ft with a surface visibility of 8km, Green a cloud base at 700ft with a visibility of 3.7km and so on.

The Royal Canadian Air Force stations at Edmonton, St. Johns and Halifax are often heard and RCAF planes are identified by the code word CANFORS plus digital.

QSLs

Receiving QSL cards from the captains of aircraft in flight is a fascinating side to the hobby and in my experience the response rate is very good. With my request, I send a prepared letter and return card to the captain of the aircraft concerned. The letter includes details of the frequency, time, brief details of the message and the name of the ground station involved, and it is addressed to the airport from which the aircraft operates. It is courteous to enclose either a s.a.e. or IRCs with your request.

As an example, in the case of a BA flight, the address would be:

The Captain, Speedbird 246, June 5, British Airways, PO Box 10, Heathrow Airport.

To date, replies have been received from the captains of 21 aircraft belonging to different companies, including one from a BA Concorde whose brother was the Radio Operator.

Addresses can be found in the *ABC World Airways Guide*. This publication is a veritable goldmine of information on commercial airlines and aircraft, and should be in the bookshelf of every airband listener. It is subscribed to by travel agents and is published, in an updated form, monthly. As the previous month's copy is usually thrown away, a request for an outdated copy is gradually granted. The changes from month to month are minimal and usually only relate to arrival and departure times. The useful information such as Airport Codes, Company Address, Flight Routings, etc., remain unchanged. Ground stations, VOLMET stations and in some cases, Air Force bases will also respond to QSL requests.

Where To Listen

Aeronautical Bands

Frequency (MHz)		Frequency (MHz)	
2.850-3.025	Civilian	10.005-10.096	Civilian
3.025-3.155	Military	11.176-11.270	Military
3.400-3.500	Civilian	11.270-11.400	Civilian
4.650-4.700	Civilian	13.200-13.260	Military
4.799-4.650	Military	13.260-13.380	Civilian
5.489-5.680	Civilian	15.010-15.100	Military
5.680-5.730	Military	17.900-17.970	Civilian
6.525-6.683	Civilian	17.970-18.030	Military
6.683-6.765	Military	21.870-22.000	Civilian
8.815-8.960	Civilian	23.200-23.350	Civilian
8.960-9.040	Military		

Volmet Frequencies

Europe		**North Atlantic**	
Shannon	3.413/5.640	Gander	3.495/6.604
	8.957/13.264	New York	10.051/13.270
Pacific		**S E Asia**	
Honolulu		Sydney	
Tokyo	2.863/6.679	Bangkok	6.676/11.387
Hong Kong	8.828/13.282	Karachi	
Auckland		Mew Zealand	
Africa		**CIS English Net**	
Brazzaville	10.057/13.261	Various	10.090/13.297
S. America		**Middle East**	
Lima		Cairo	
Brazil	5.601/10.087	Bahrain	5.589/9.845
Buenos Aires	13.279	Istanbul	

As a start, the following bands are fairly active, but it must be emphasised that patience is required and the achieve success is to select one, or at the most, two bands and concentrate on them fro some time rather than hop around from band to band. Although English is the universal language used for air communications, the speech is sometimes rather rapid and pronunciation somewhat fractured. A tape recorder coupled to your radio is very helpful in overcoming these problems.

Mornings Freq (MHz)	Station	Evenings Freq (MHz)	Station
6.556	Jakarta, Rangoon,Singapore	6.628	New York, Maria
8.828	Hong Kong, Honolulu	6.684	New York, Gander
8.867	Honolulu, Sydney	8.825	New York, Shannon, Santa Maria
8.879	Perth, Mauritius, Gander	8.861	Dakar, Abijan, Recife, New York
10.066	Calcutta, Bombay, Colombo		
11.200	RAF West Drayon (Weather)	10.051	VOLMET New York, Gander
11.176	USAF Ascension, Croughton, UK	11.300	Mogadishu, Jeddah, Cairo, Nairobi

Endless Flow

Airband monitoring provides an endless flow of interesting information and is an excellent introduction to utility listening. Navigation maps showing waypoints can be obtained from hobby shops, some of which are advertised in ***SWM*** and with their aid aircraft may be plotted along their routes from take off to destination. For a club competition I once followed the flight of a SAA Boeing from Taipei to Johannesburg, with a stop off at Mauritius, monitoring every report along the route. The whole exercise covered 13 hours and although a little exhausting was a very interesting exercise - as a one off!

In conclusion it must be remembered that all information heard is confidential and must not be divulged in public. ■

IMPORTANT NOTICE TO ALL READERS

Twelve months ago, Lynchy was telling you why an extra 1 year warranty really wasn't necessary. Things are more reliable, blah, blah, why don't we all give 10 years, blah, blah and loads more. You still persisted in asking for longer warranties so we think you will approve of this one.

ENTER THE *FIVE YEAR* UK WARRANTY FOR SHORT WAVE LISTENERS!

No joke. This is serious. Purchase a new piece of gear from Martin Lynch and he'll offer you the chance of a whole FIVE YEARS WARRANTY, covering parts & labour but excluding "dial lights"; (you mean you can't change a bulb??). In the event of a break down, the warranty also includes COLLECTION & DELIVERY on the U.K. mainland.

Furthermore, buy a USED piece of gear from him and he could offer you a staggering FIFTEEN months warranty. For the cynics amongst you, it does cost. But before you pooh-pooh it, think about this. Three chaps in February bought FT-1000's from him. All three wanted FIVE YEARS. (They probably got it when their wives saw the invoice). For less than the cost of ONE HOURS labour per year, they now have TOTAL PEACE of MIND. That new Dual Band Handie you've just bought could have had FIVE YEARS WARRANTY for under £14 a year. Oh, and another thing. If you sell on your equipment before the FIVE YEARS has expired, the new owner can have the warranty transferred, at no extra cost. That instantly increases the "re-sale" value. Good isn't it? Think about it next time you buy a new or used piece of kit.

If you would like more details or have purchased equipment from MARTIN LYNCH within the last SIX MONTHS, then hurry. The extended warranty could still be available to you.

5 Year UK Warranty for Short Wave Products

5

MARTIN LYNCH
G4HKS
THE AMATEUR RADIO EXCHANGE CENTRE

Telephone Jennifer on

0181 566 1120

and ask about 'Take 5'

Another First From

MARTIN LYNCH, 140-142 Northfield Avenue, Ealing, London W13 9SB

SWM SUBS' CLUB

THIS OFFER IS NOT AVAILABLE TO NON-SUBSCRIBERS

Save energy, money and the environment with our Nicad and charger offer.

SAVE £5.00

Buy eight rechargeable AA cells and a rapid charger that will charge all of them in one go in about 2 hours for only

£19.95 plus £2.50 P&P.

The normal retail price is £24.95...Save £5.00

The charger will also charge two, four, six or eight cells at a time. AA or AAA size.

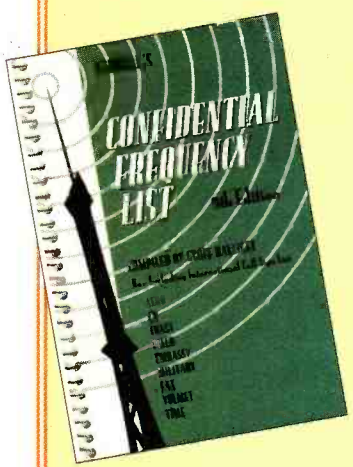
Cells supplied will be 500mAh type.

The cells shown are for illustration only, those supplied may vary.

Just the job for every household - let alone the radio shack.

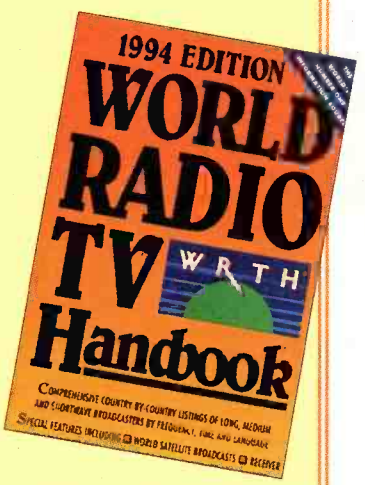
To order this Subs' Club item please use the form on page 91.

BOOK BONANZA



THIS MONTH

We have an unrepeatable offer, the opportunity to obtain both Ferrell's Confidential Frequency List - 9th Edition and the 1994 World Radio and TV Handbook for a combined price of £21.95 plus P&P.



Now you can explore the world of both utility and broadcast stations with this great deal.

Save £11.95

Normally £33.90 for the pair.
Post and Packing £2.00 UK, £3.75 overseas surface.

Save £11.95

To order your book(s) please use the form on page 91.

Radio Secrets of the War - Part 2

Radar Wars

This month David White reflects on the invaluable aid to the war effort that was Radar.

One of the far sighted individuals mentioned in Part 1 was Sir Henry Tizzard who was Rector of the Imperial College in London. In December 1934, he set up a committee to scientifically survey the air defence of Britain. They immediately consulted Mr R. Watson Watt who was director of the Radio Research Station in Slough.

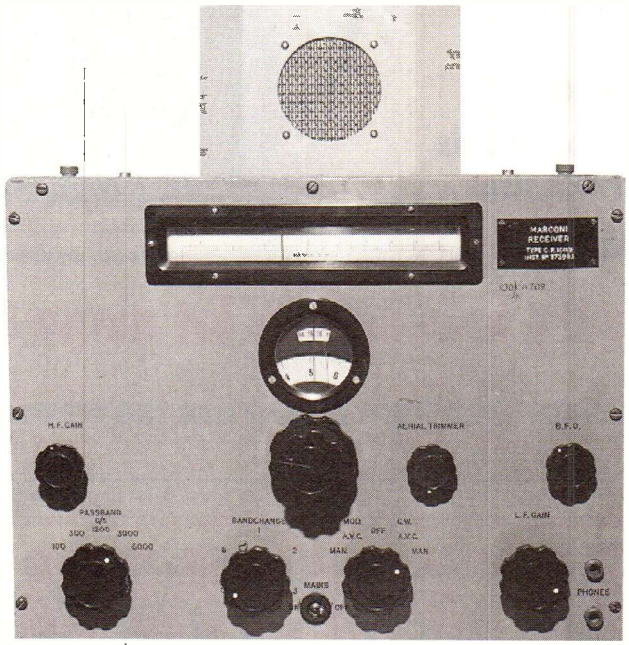
The first practical demonstration took place on February 26 1935, when the radio transmitter at Daventry radiated a signal at a Handley Page Heyford biplane bomber. Reflected signals from the bomber were clearly received, which led the government to give the go ahead for research into a system for the detection of aircraft.

The first system was set up at Orfordness on May 13 1935 which was a remote site 144km north east of London. Antenna masts some 23m high were erected and the high power transmitters used Naval silica valves, type NT46 which were at that time of the highest power known with a potential of some 10kV.

The wavelength of the signals used was 50 metres, which gave a strange effect. Due to the reflection of signals from the Ionosphere, land formations several thousand miles away were being recorded.

This was the first time that the equivalent of the modern 'Over the Horizon Radar' had been seen. This, however, was not what was wanted, and a range of 100km was in fact needed. Monday June 17 saw the first radar contact made with an aircraft which had not been pre-arranged.

It turned out to be a Short Scapa flying boat, at a range of 27km from Orfordness and on a routine flight from the Felixstowe air station and which gave good echoes for the 30 minute flight. This was good news indeed and this success spurred on the team so that by the spring of 1936, a detection range of 160km was being recorded.



Marconi CR100 receiver as used by the Voluntary Interceptors.

Resounding Success

This success prompted the treasury to allocate a budget of £1 000 000 to set up five radar stations around the Thames estuary. March 1936 saw a move to high ground next to the coast at Bawdsey Manor on the mouth of the river Deben. After the five radar stations had been constructed, a major exercise was attempted with the co-ordinator of the RAF at Biggin Hill in the autumn of 1937.

It was a resounding success and paved the way for the Home Defence radar chain which was subsequently set up all around the coast. One of the original five stations even managed to track the Prime Minister, Neville Chamberlain's aircraft for over 160km on his infamous visit to appease Hitler in 1938.

The Metropolitan Vickers Company built the chain's transmitters and A C Cossor & Co built the receivers. Marconi built the antenna arrays of the 25 stations which were in place for the great air battle of 1940.

At the end of the war, the German General Galland said that the German High Command had expressed surprise that the British had at its disposal such a highly developed technique of closed mesh radar system, the like of which the Germans could never match.

Accurate Attacks

In 1940, it was noticed that the German bombers were delivering very accurate night time attacks on Britain cities. It wasn't discovered exactly why until a crashed German bomber, which had most of its equipment undamaged, was found to have a very sensitive receiver on board which was tuned to the v.h.f. bands above 30MHz.

It was far too sensitive to be used for the Lorenz blind landing system which it was assumed to be a part of, so the suspicious British authorities fitted it into a British Avro Anson aircraft and two Hallicrafters v.h.f. receivers were installed in two further Ansons based at Wyton in Huntingdonshire.

For the first two nights nothing was heard, but on the third night, which was June 21 1940, one of the aircraft detected a Lorenz type transmission on approximately 32MHz. They had discovered a narrow beam transmission that the Germans called 'Knickebein' and which translated into English as 'Crooked Leg'.

This consisted of two high power Lorenz type transmitters located at Audembert and Cherbourg on the French coast which had their antenna systems arranged so that a radio transmission of approx 35MHz gave a beamwidth of about 1.6km at a distance of 290km.

If both beams were aimed at a town such as Coventry, then all the German aircraft had to do was fly along one beam and when their receivers indicated that they were crossing the path of the other beam, drop their bombs with a high degree of accuracy.

There were hardly any v.h.f. receivers available at the time. Some of the few were the British 1132A and the American S27 which was starting to be received in large numbers and it was types like these that listened to the beams. Once the authorities discovered exactly what these transmission were, then steps were taken to jam them.

The wireless operator of

the Anson, a Corporal Mackie, had determined that one beam had Morse code dots to the south side of it and dashes on the north side, and the second beam had the dots and dashes reversed.

The German aircraft would assemble in the air over France and then fly along the Cherbourg beam to the point where it would intersect with the other beam over a target. If they wandered off course to the right, then a series of dots would be heard on the Knickebein receiver.

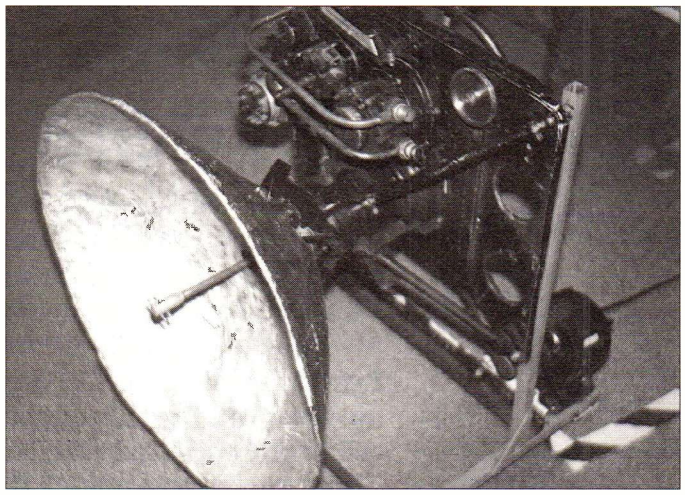
The pilot would then correct his course until a steady tone was heard. If the aircraft wandered too far to the left, then a series of Morse dashes would be heard, therefore the pilot would know he had to correct his course to the right again.

Transmission Source

The source of these transmissions were located by the direction finding stations of No. 61 Wireless Unit based at RAF Cheadle, but it was thought we would reveal to the enemy our knowledge of these beams if we bombed them, so instead, electronic counter measures were taken by a newly formed No. 80 wing which was put together on June 18 1940 and initially based at Garston near Watford and which later moved to Radlett in Herts.

A series of high power transmitters were set up radiating Morse code dashes on the frequencies of 30, 31.5 and 33.3MHz and these were called 'Aspirin' in order to counteract the headache that these beams were giving us! The jamming was so successful that the system was almost completely curtailed by the Germans at the end of November 1940.

In the meantime, they were not idle and had developed another system which was first used in late August 1940 and was known as 'X Geraat'. This system was found to use a much higher frequency in the 70MHz band and the transmissions were detected as coming from five different locations at Cherbourg, Morlaix and Dieppe on the French coast and Cleve on the German/Dutch border and Stollberg in Schleswigholstein.



Radar Signal Identification Unit IFF Mk2 (identification friend or foe) determined if the approaching aircraft was friendly or not.

The Cherbourg transmitter was radiating a normal single beam tone but the Cleve transmitter was found to be radiating three beams spaced apart by about 32km like a fan. The British code name for this new type of beam was 'Ruffian'.

The German bombers flew along the Cherbourg beam as before, but when they ran into the first of the cross beams, it gave them an advance warning of the target. As they crossed the second beam the navigator started a mechanical computer and when the third beam was crossed, it automatically triggered the bomb release mechanism and the computer had calculated the speed, height and trajectory of the bombs.

The frequencies were all between 65 and 75MHz and were spaced apart by 500kHz steps. The electronic counter measures were finally put in place during November 1940 and the British code name for these counter measures were called 'Bromide'.

In July 1940 another kind of secret radio transmission was brought into use by the Germans. It was designed by Dr Hans Plendl and was called 'Y Geraat' and operated in the 40MHz band.

This system used only a single beam, but could be keyed with Morse code to pass instructions. Modulation was superimposed at 20kHz on the main frequency and this conveyed the exact distance that the place was flying from the transmitter at Cherbourg. The bombing accuracy was amazing and could be less than 150m off target.

The measures taken to counter this latest secret radio beam was to set up several v.h.f. receivers on Highgate Hill in London and relay the signals by landline to the television transmitter at Alexandra Palace in north London.

This high power transmitter, which had ceased television programmes in 1939, then re-radiated the German ground wave beam transmission to the aircraft, which of course, prevented the aircraft from receiving bomb release information. This was nothing short of a disaster for the German aircraft.

All three types of radio beam had now been effectively countered, although it did not prevent the Germans from trying to use them until 1943. At the height of the radio beam war, there were 12 special beam transmitting stations located on the coasts of France, Holland, Germany and Norway. After this failure they instead turned their attention to mucking up the British system of navigational aids which they did right up to the end of the war.

Voluntary Interceptors

On September 1 1939 all radio amateur licences were withdrawn and all stations closed down and their equipment impounded. Shortly afterwards the Radio Society of Great Britain was approached by Lord Sandhurst who was an official of the Radio Security Service (MI5) and asked if the RSGB members could be requested to set up a special listening system to watch for enemy agents and radio beacons in Britain.

Hundreds of Morse reading radio amateurs volunteered for this duty and combined it with their daytime jobs. They were each issued with a communications receiver such as an HRO or Eddystone and were each told to listen to a particular 500kHz band for a period of two hours at a certain time of the day or night depending on their work shift.

No enemy beacons and very few spies were found but they had accidentally discovered an increasing system of intelligence networks between radio stations in Germany and all the countries that they had occupied and certain ships.

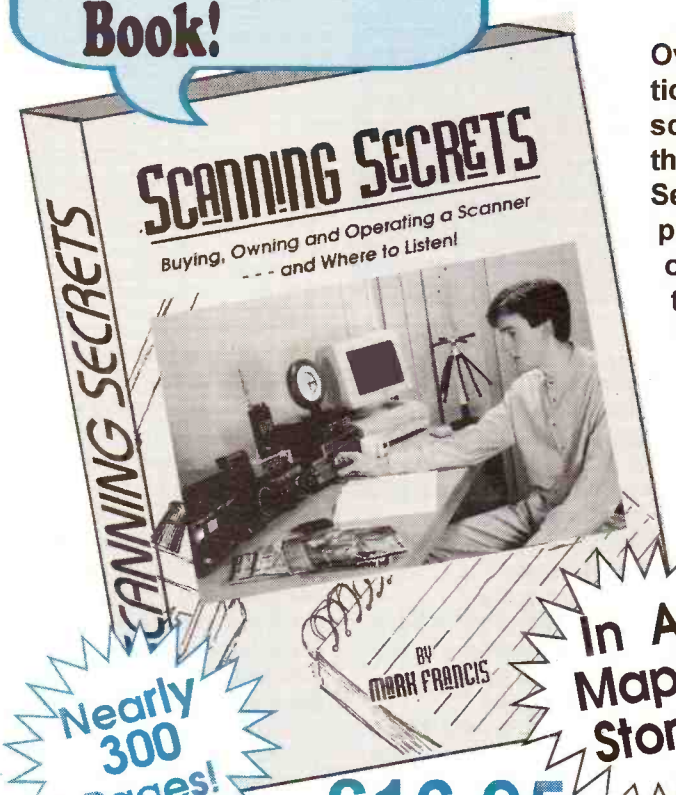
They operated differently to the normal German forces networks with constantly changing callsigns and frequencies, which made monitoring difficult. This discovery was considered so important at the time because the official Y network was simply not intercepting it. All the VIs filled up their supplied radio log every night and posted it immediately to a secret cryptic address which became famous as PO Box 25, Barnet.

Barnet, in reality consisted of three country mansions at Barnet Arkley View and Meadowbank, all within a radius of about 1.5km, augmented in the grounds by large numbers of wooden huts.

Every possible bit of intelligence was extracted from the logs before passing them onto Station X at Bletchley. The GPO was so efficient then that logs posted on a Tuesday

01702 206835 Waters & Stanton

Exciting New Book!



Nearly 300 Pages!

In All Maplin Stores

"SCANNING SECRETS"

At Last The Truth!

Over 280 pages and 30 chapters crammed with information. Gives you advice on buying and operating your scanner. Explains all the mysteries of monitoring. What's the best aerial, how do you improve your reception? Secrets and hints on all those topics not covered by other publications. New frequency modes, encryption, methods of finding obscure frequencies. You get all the information you need to unlock the power of your scanner. Hunt those elusive signals down. Nothing's secret any more! We expose all the myths and folk lore. This book gives you the truth. If you own a scanner you can't afford to miss this valuable reference book. It's UNIQUE

Order today

DO IT NOW!

01702 206835

VISA

£16.95

Postage £2.00 extra.

OUT NOW! It's Great

MFJ-8100K Short Wave Kit

Everything supplied - even cabinet

£69.95 Post £5

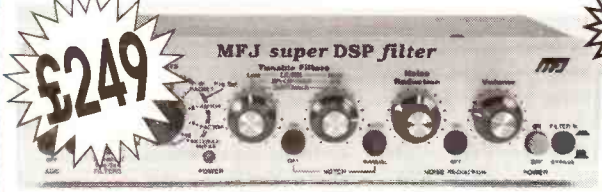
£49.95 P&P £2

A great educational project. Gives you SSB, CW and AM. Battery powered. Great value.

Sky-Scan Base 25 - 1300MHz

MFJ-784 "Best DSP filter Today"

£249



This amazing DSP filter is fully programmable with memories and features no other DSP offers. You can adjust bandwidth, upper and lower limits. Every parameter can be varied - makes the rest yesterday's models. Works with all receivers and scanners.

£9.95 P&P £2

QS-200 ScannerMobile Mount

MFJ-8400K 2 metre Receiver Kit Includes Cabinet etc. Vernier dial and squelch **£79.95** Post £2.50

"Police Style" Lapel Speaker

NEW

£9.95

Ideal for scanner owners. Clips on lapel or seat belt. Gives clear crisp speech. Similar to that used by Police. Fitted with curly cord and standard 3.5mm plug. Matches all scanning receivers. **Postage £1.50**

8 - way AA Battery Charger

FAST CHARGE in Two Hours!

NEW

£12.95

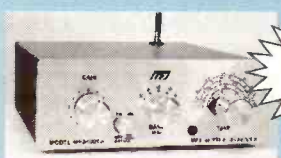
ANT-60 Portable 30ft wire aerial

£14.95

MFJ-105B 24 Hour Clock

£24.95

MFJ-1020A Active SWL Antenna



0.3-30MHz £99.95

WATSON

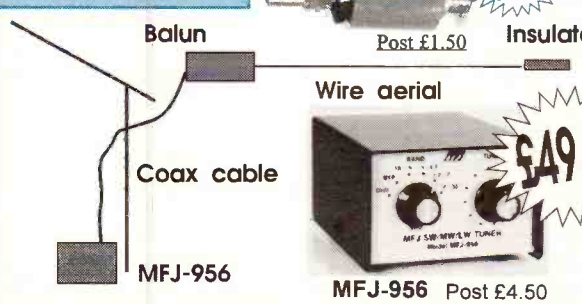
Long Wire Balun transforms your scanners short wave performance

Package Deal Balun & ATU **£67.50** Post free

NEW

£19.95

Post £1.50



£49.95

MFJ-956 Post £4.50

The most amazing improvement in short wave scanner reception (1.5 - 30MHz). Just add the long wire balun to the end of a wire, add the MFJ-956 passive preselector and hear signals literally jump out of the noise! Makes reception as clear as many base station receivers. Lets you realise the full potential of your scanner. Full 10 day money back gurantee - now that's confidence for you!

Everything For The Listener

The products below are also available from all **32 MAPLIN STORES**

WATSON

New

25 - 1900MHz
A new range of scanning aerials designed to give you what others promise.

Tele-Gainer: 41cm telescopic with knuckle joint BNC . **£14.95**
Regular-Gainer: 21cm flexible whip BNC **£12.95**
Super-Gainer 40cm flexible whip BNC **£19.95**

Hear the difference

Pocket the difference!

These antennas are specially made by Watson to enhance your scanner's performance. They are of extremely high quality and the first true dedicated 25 - 1900MHz scanning aerials to be offered in Europe. Don't be fooled by the low prices - these really are great performers.

£389.95

YUPITERU

MVT-7100UK

100kHz - 1300MHz Scanner Receiver

WFM-NFM-AM-SSB
Maplin Ref RU00

Only when you buy Yupiteru from ourselves or any Maplin store do you get the following:

* **Genuine factory chargers**
* **Yupiteru UK Warranty**
* **Free Warranty Extension**
* **WSE Service backup**

£289.95

MVT-7000UK

100kHz - 1300MHz Scanner Receiver

WFM-NFM-AM
Maplin Ref CM00

REALISTIC

£199.95

PRO-44
68-88/108-174
380-512MHz
FM/AM
50 Memories
Maplin Ref AG98

PRO-46
66-88/108-174
406--512/806-960MHz
FM/AM
100 Memories
Maplin Ref AG97

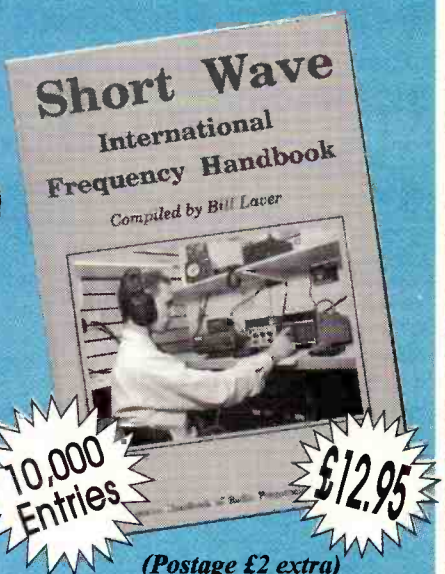
£149.95

PRO-46 PRO-44

Short Wave International Frequency Handbook

New 10th Edition

* *Completely Revised*
* *10,000 entires 500kHz - 30MHz*
* *Marine, Aviation, Military, Press etc*
* *Every entry monitored and checked*
* *All old information removed*
* *192 A4 size pages beautifully bound.*
* *Frequency, callsign and mode*
* *Location and times etc.*



10,000 Entries

£12.95

(Postage £2 extra)

Phone order today: 0702 206835

VISA

Second Hand

Mobile/Base Scanners		
R-535	Airband VHF/UHF the business!	£239
MSS-1000	500kHz-1300MHz	£199
BC-700	Bearcat 29-54/108-174/406-512/900	£149
Handheld Scanners		
IC-R1	100kHz-1300MHz	£299
AR-900	AOR 108-174/220-470/840-950MHz	£119
AR-1500	500kHz - 1300MHz SSB	£249
AR-1500EX	0.1-1300MHz inc SSB	£269
AR-1000	8-600/805-1300MHz	£219
Black Jaguar	26-30/60-88/115-260/410-512MHz	£119
Bearcat 50XL	Bands - 10 channels	£79
Pr0-37	68-88/108-174/300-512/806-960MHz	£139
Pro-41	Handheld Scanner	£99
Pro-44	68-88/108-174/380-512MHz	£99
Pro-43	66-88/118-174/220-512/806-960	£129
MVT-5000	25-550/800-1300MHzx	£199
VT-225	Airband civil & Military	£169
Air-7	Sony - SSB SW + VHF	£149
Sony PRO-80	150kHz - 30MHz (SSB) + VHF	£149
Short Wave		
DX-390	Realistic short wave with SSB	£99
HF-225	30kHz - 30MHz superb radio	£399
ICR-72	Icom's super model 100kHz-30MHz	£599
ICF-760L	Portable short wave	£69
ICF-SW77	Sony super portable	£299
ICF-7600G	Portable with SSB + AC psu	£139
ICF-7600	Portable short wave	£109
Accessories		
MFJ-1278	Data controller	£199
PK-232	Data unit (see SWM review)	£199

Yaesu
FRG-100
Short Wave

Phone for Price

Phone for Price

LOWE
HF-150
Short Wave

Open Day

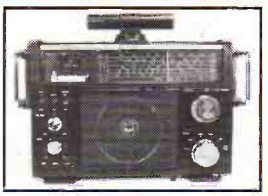
Sunday 21st May

Many items at **trade prices!** Be There!

Free food & drink - 145.550MHz

MBR-7
Short Wave
& VHF
AM FM
Batt. or Mains
£69.95

Carriage £5.00



New AT-2000 Rx ATU

Hear the difference!
Unique "Q" Selector

The Best Receiver ATU - Amazing! 100kHz - 30MHz
£99.95

ALINCO

DJ-X10 Scanner

Offer Price £299

AM - NFM - WFM
200kHz - 1300MHz

* No gaps
* 100 Memories
* Battery Saver
* Ni-cads & Charger
* Fully programmable
* Helical whip
* LCD readout
* Rotary tuning knob
* Tough case
* Very sensitive

Maplin Code CM84

In All Maplin Stores

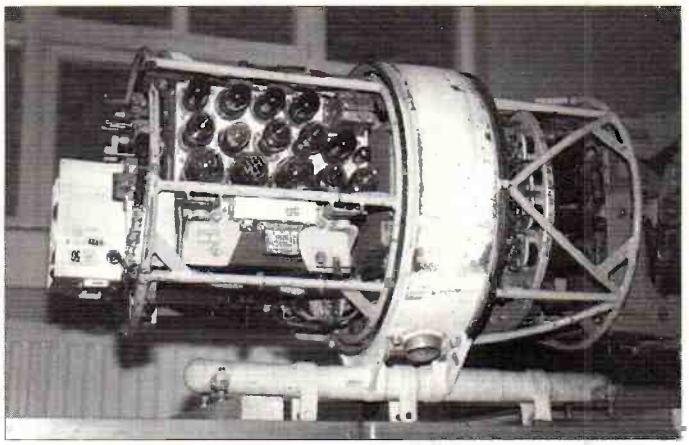
Shop and Mail Order; 22, Main Rd., Hockley, Essex. SS5 4QS Tel: (01702) 206835 Fax: 205843
VISA Branch Shop: 12, North Street, Hornchurch, Essex. RM11 1QX Tel: 01708 444765 ACCESS
MAIL ORDER To Hockley - 24 Hour Answerphone and Fax. Open 6 Days 9am - 5.30pm

morning would have the reply on the doormat on the Thursday morning!

As an example of the system, VI Ray Fautly from Cheam initially listened on his home-made receiver, but was later supplied with a Marconi R1155, which he modified for band spread. He would listen on 7 to 7.5MHz between 8 and 10pm on four evenings a week.

Official Organisation

As the war progressed, the receiver was changed to a Marconi CR100 and finally to an RCA AR88, both of which seemed to weigh a ton. Because of the way the VIs seemed to be able to sniff out the secret clandestine type radio transmissions, it was decided that an official organisation ought to be set up. So, Special Communications Unit No. 3 was formed going operational in November 1941 at Hanslope Park. This was a country mansion near Bletchley and was connected by teleprinter to Bletchley Park. A smaller station was set up at Forfar in Scotland.



Airborne interception radar Type AI MkX used by British and American aircraft from October 1943. It used a Western Electric magnetron and was used to detect both shipping and aircraft.

At Hanslope, six HRO receivers were set up in an old farm granary and supplied all the German secret intelligence traffic until the main station was completed in May 1942, when 60 HRO receivers were installed. The staff consisted mainly of radio amateurs.

The VIs continued to discover more and more secret transmissions throughout this period. Their numbers totalled 1450 at the height of the war. Their work was found to be of such value that at the end of the war, they were all asked to assemble at the Albert Hall in London where they were all officially thanked and given a certificate to commemorate what they had done for their country.

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

Reflections

While looking at the American encyclopedia *Encarta '95* on the computer screen, via CD-ROM, Joan said, "I wonder if H.G. Wells had something like this in mind when he wrote *The Time Machine*". The next step was to borrow the video of the film of that name from our county library. In this film, the young Rod Taylor played the part of Wells who projected himself hundreds of years into the future. OK, it is an award winning Sci-fi made some time ago, but, as he travelled, there were mushroom clouds exploding, a man dressed in a silver suit and 'the talking rings'. Could the author have forseen the atom bomb, the space man and the compact disc? As the film progressed, the time traveller met a group of people who showed him their history books, which were practically useless because they crumpled to dust when handled. However, instead of books they had 'the talking rings'. These were portrayed as small circles, about the size of a CD, which were spun edgeways on a highly polished surface and, while spinning told a part of their history.

Encarta '95

I wonder what Herbert George Wells, who wrote *The Time Machine* in 1895 [he died in 1946], would have thought of a 'spinning disc', not unlike his 'talking rings', called *Encarta '95*, where I found his photograph and a very good outline of his life and work.

To have an encyclopedia quickly available on a CD-ROM has many advantages. In my view, it's an excellent reference work for all readers, because it provides a great deal of information on the majority of subjects that we cover in this magazine. For instance, there are numerous articles on aircraft, astronomy, communications, computers, electronics, radio (including valves and transistors), satellites, television and weather.

I tested the 'Find' menu by typing the word 'amp' and later 'Volt' in the space provided and was given a lengthy text on both. However, when 'ohm' and 'watt' were requested the reply was "see Electrical Units". These words are coloured red and, when 'clicked' with the mouse cursor, information on these and other electrical units is provided. Next I asked for Marconi and up came the 'M' section of the index. I highlighted 'Marconi, Guglielmo, Marchese', gave it a 'click' and a well written account of his life with a photograph and a list of six 'Related Articles' appeared. These naturally included Broadcasting, Radio and Telegraph.

Very often, when reading a technical publication or an equipment instruction book, a word occurs that leaves one puzzled. That's the time when an encyclopedia like *Encarta* can help. What about valves I thought?, being as the Americans call them 'tubes'. However, they came up under 'Vacuum Tubes', with a picture of a model of Fleming's first wireless valve heading the article.

I called up 'atmosphere' and in addition to good text there is a picture presenting the layers in the first 120km above the earth's surface. Next came ionisation and troposphere and these likewise had good explanations and many related articles and illustrations on both subjects. The latter included radio and radio astronomy, climate & meteorology. Before closing this absorbing disc I tried 'Wave Electromagnetic' and it highlighted, in red, 'see Electromagnetic Radiation' and 'see Wave Motion'. All text in red can be called up by a click from the mouse and the former produced a detailed illustration of the full electromagnetic spectrum.

Fig. 1.

When the *Encarta '95* title appears, the user is offered four options. Three of these are instructional indexes and the forth is ENTER which takes you into the main program. My first action was to 'click' the appropriate button at the top right to make *Encarta* fill the screen.

A menu bar along the top offered a catalogue of nine main subjects. My prime interest came under the heading 'Physical Science & Technology' and when this was 'touched' by the cursor a further list of 15 subjects was offered. Among these, of direct interest to me, is 'Astronomy & Space Science', 'Computer Science and Electronics', 'Communications and Earth Science' and 'Physics'. Such additional lists appeared on each of the nine main topics.

Further assistance was provided by the 'Features' and 'Tools' boxes which, between them, included Atlas, Media Gallery, Timeline, Browse Panel, Dictionary/Thesaurus and a Word Processor.

Encarta '95, to me, is enjoyably time consuming, user friendly and I would imagine a great help to anyone studying radio theory or any other scientific subject.

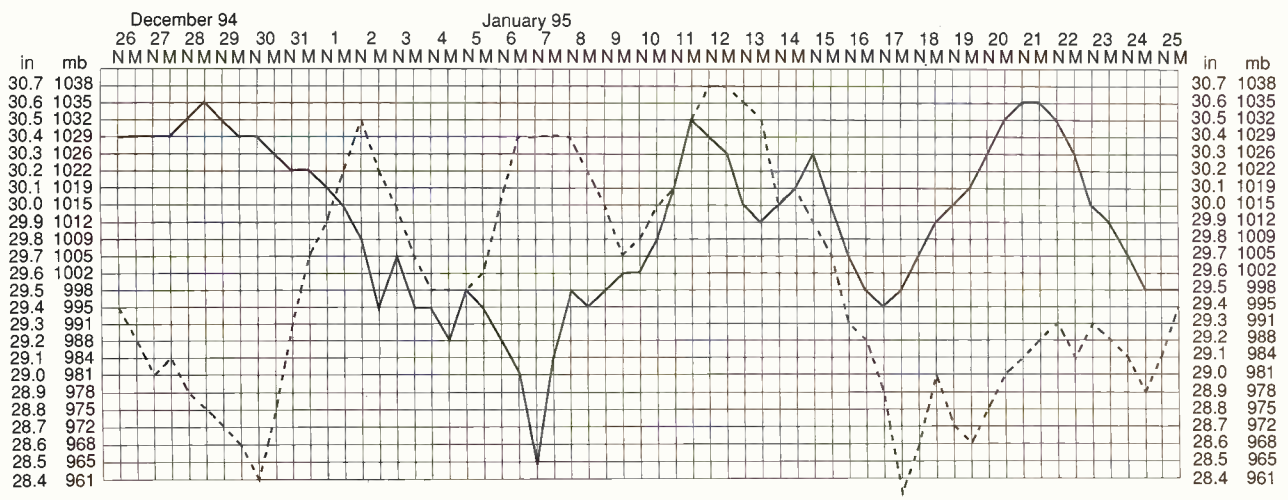
Red Shift

Although encyclopedias like *Encarta* and *Grolier* have good coverage of astronomy and radio communications, I decided to add another dedicated astronomy package to my collection and opted for the Windows version of *Red Shift*, by Maris Multimedia Ltd., London.

I usually judge how user-friendly a program is by seeing just how far I can get without referring to the instructions! The spiral bound book packed with *Red Shift* has 55 pages of text and more than 40 of these have some form of illustration. In addition to the main stella program, there is a Photo Gallery with some 700 pictures, a number of short video clips, an updated *Penguin Dictionary of Astronomy* and a Movie Recorder.

"The simplest way to find out about *Red Shift* is to use it," says the book. How right it is, because once you master the control menus the rest of this complex program comes easy. Don't be afraid of getting into difficulties by 'playing' because you can always go back to the 'Default Settings' command in the controls menu and start again. The user has

Fig. 2.



the choice of viewing the stars from any point on the earth, moon or mars. In addition to the *Dictionary of Astronomy*, which alone is a valuable reference work, the program has, full screen, detailed maps of the earth moon and mars.

When the title of *Red Shift* appears on screen after loading, the user is offered 'Guided Tours' or 'Main Program'. I began by selecting the latter, but more about that next time, because, to attempt to review *Red Shift* in a short space is like trying to put the earth inside the moon, hi. (*We have the Macintosh version of* Red Shift *here in the Editorial Offices and have used it to produce a couple of recent* SWM *covers - it really is superb running on a Mac! - Ed*)

Observations

Because astronomers have enemies, such as overcast skies, bright moonlight, street lighting and car head-lamps to contend with, programs like *Red Shift, Skyglobe* and *Distant Suns* do offer an instructional alternative to outside observations.

Solar

Seeing the sun is not always easy during the winter months because of frequent bad weather. Despite this, **Ron Livesey** (Edinburgh), using a 2.5in refractor telescope and a 4.0in projection screen, managed to observe one active area on the sun's disc on December 6, 7, 9, 12-16, 19-22, 25 and 27 and two on the 8th and 18th. At his observatory in Selsey, **Patrick Moore** found the sun spotless when he made his routine morning observations on December 31 and January 1-3, 6, and 11-13. However at 1030 on the 23rd his projection screen revealed the group of spots seen in **Fig. 1**.

Sunspot groups are a hot bed of activity that can often be detected with a v.h.f. radio-telescope whether the skies are overcast or not. I plan to say more about solar radio-astronomy later in the year.

Aurora

Ron Livesey, the auroral co-ordinator for the British Astronomical Association, received reports of aurora described as 'glows or patches' for the overnight periods on December 3/4, 5/6, 6/7, 10/11 and 28/29, 'quiet arcs or bands' on 5/6, 9/10, 11/12, 15/16, 25/26 and 26/27, 'ray bundles' on 10/11 and 'active aurora' on 28/29, from observers in Banff, Fair Isle, Iceland and Portpatrick.

Magnetic

The magnetometers used by **John Fletcher** (Tuffley), **Tony Hopwood** (Upton on Severn), **Karl Lewis** (Saltash), Ron Livesey, **David Pettitt** (Carlisle), **Tony Rickwood** (Gillingham) and **Tom Rackham** (Goostrey), between them recorded strong disturbances to the earth's magnetic field on December 6, 15 and 24 and lesser activity on days 1-4, 7, 8-11, 13, 16, 18, 19, 20 and 25-27.

Weather

"Yet another soggy month," wrote **Arthur Grainger** (Carstairs Junction) at the end of January. He told me, that after the 17th, most days had a combination of rain-sleet-hailstones and snow. The snow turned heavy for a couple of days but was soon washed away by more rain.

"January was another blank month for DX signals", wrote **Richard Wood** (Redditch) and added, "the predominantly wet weather was probably the main culprit." Since Richard fitted a rotator to his 18-element u.h.f. antenna he can now 'home-in' and receive signals from the BBC, HTV and S4C from the Wenvoe transmitter, Central South from Ridge Hill and BBC South and Meridian from Hannington.

I recorded 6.76in of rain in January compared to 6.33in for the same period in 1994. The largest amount of 1.0in fell on the 27th and amounts greater than 0.5in fell on the 5th, 18th, 19th, 21st, 22nd and 25th with smaller quantities on days 8, 20, 26, 28, 29, 30 and 31. There were frosts on the 2nd, 3rd, 4th, 7th and 12th, with overnight temperature sometimes down to 23°F, some snow on the 1st and hail and thunder on the 20th.

The daily atmospheric pressure readings for the period December 26 to January 25, seen in **Fig. 2**, were taken at noon and midnight from Arthur Grainger's barometer (dotted trace) up North in Lanarkshire and my own barograph down South in Sussex. My thanks are due to Arthur for his support which enables me to show variations of pressure over a wide area of the UK.

SSTV

First, our my are due to **John Scott** (Glasgow) on passing the RAE and by now he should be active transmitting slow-scan television signals, around 144.500MHz, with a GM7 callsign. Among the captions copied by John in January were two carrying good wishes for 1995 from stations in Spain, **Fig. 3** and the USA, a 'CQ' from G0NAR, **Fig. 4**, a picture of a dog from C31HK, **Fig. 5** and photos of the operators from Venezuela, **Fig. 6** and the USA. John says that W5ZR is a good station to look out for around 14.230MHz in the mornings and, if evening conditions are favourable, there are some fine pictures to be received from around Europe on the 3.5MHz band.

Fig. 3.

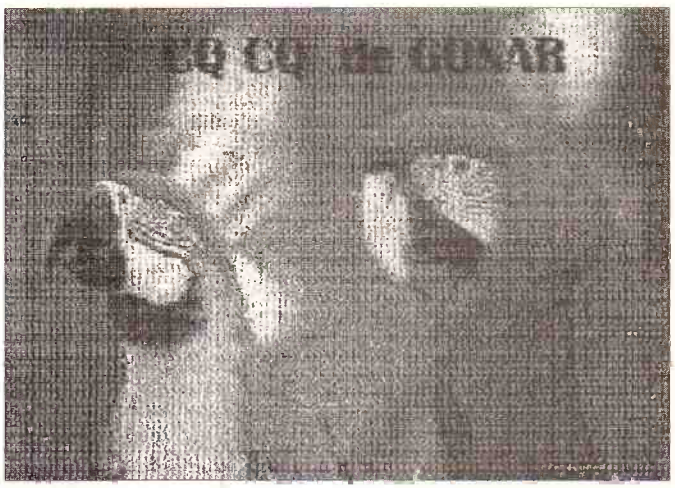


Fig. 4.

Fig. 5.

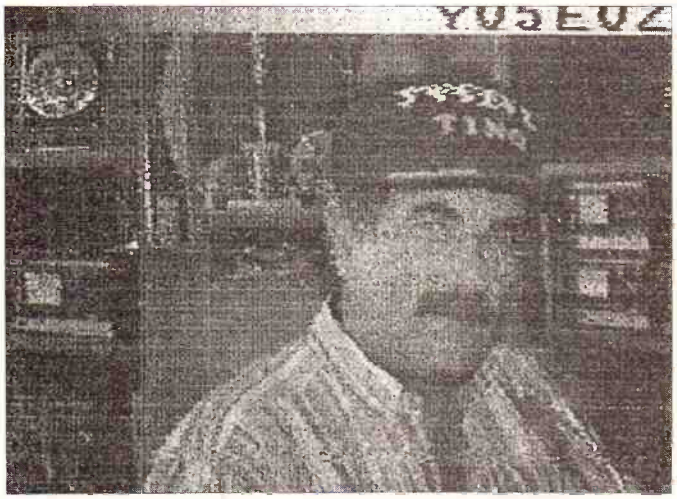


Fig. 6.

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

Satellite TV News

The Latest from the Clarke Belt

Mid-January through into February has proved a relatively quiet period with - fortunately - little in the way of disasters to dramatise our reception logbooks. My own equipment for the first time in seven years produced an unusual fault condition. all received signals suffered sharp horizontal lines across with audio buzzing. The problem was localised eventually down to a faulty +18V line supplying LNB voltage via the receiver's tuner head. A sudden loss of smoothing electrolytic on that line caused a spiky hum instability which fed into the LNB distribution amplifier and hence to all receivers! This took me out for several days, though fortunately other readers have provided numerous sightings....

A query has arrived from **S. Foster** from Ashington, Northumberland who enquires as to the signal route of the World Wrestling Federation's Royal Rumble in Tampa, Florida, which was apparently broadcast via Sky Sports during the early hours of January 23. The Sky operation makes use of numerous satellite transponders on both long term leases and short duration events, such as a single programme. During the Parkhurst prison break earlier this year, I noticed Sky use Eutelsat I F4 @ 25°E for a line SNG (satellite news gathering) feed for the 'on the hour news' and an insert one hour later was carried over Eutelsat II F3 @ 16°E. I suspect that the random use of satellite capacity is based on convenience and cost. Many programme feeds bound for Sky from the States are fed via Intelsat K @ 21°W, usually over one of the leased Reuters Ku-FSS band transponders - such as the various ABC and NBC news programmes - and are in the clear complete with American adverts. Overseas sports feeds may derive with locally originated commentary + atmos as composite programme offering, sometimes only an atmos track + their local TV programme commentary. The latter is intended as guide track and a UK based commentary can be added using the clean atmos track mixed with a locally (UK) voiced over track.

What one reader described as 'very boring' is the satellite fed offerings from the European Union, the various meetings being carried over the 11.080GHz horizontal transponder 21 on Eutelsat II F2 @ 10°E. **Andrew Sykes** (Kings Lynn) comments that proceedings were first carried on January 23 and that at other times a rolling caption timetables the forthcoming attractions. **David Thorpe** ('Transponder' bulletin) writes that the EU feed uses a narrow bandwidth transmission at 19MHz rather than the more usual 27MHz, this suggests that room has been provided for other transmissions, digital, etc. Audio is carried on several sub-carriers, check out 6.6; 7.02; 7.20; 7.38; 7.56MHz. Life at the EU seems easy as most of their (few) meetings are usually carried late afternoon.

'BBC WORLD' opened January 26 @ 1959CET and several readers have indicated their pleasure at the programming albeit many are repeats of earlier BBC 1, 2 offerings. An excellent signal from Eutelsat II F1 @ 13°E, the exact frequency is 11.61966GHz with mono audio 6.60MHz and stereo 7.02/7.20MHz using Panda 1 - and it's in the clear. It will be welcomed by UK pats living in their warm exile in Spain and Cyprus and I would suspect many overseas cable operators. The same day as 'BBC World' opened up another unusual corporate production was transmitted into the UK from the 'Xerox Document University Studio C' using the new Orion 1 satellite at 37°W with a very strong signal in Telecom band 12.581GHz. The programme was intended for Xerox employees in Europe from 0930UTC but originated live from the 'States at 0330EST. An interactive offering, viewers could react on the 'phone or pushing appropriate keypad button flashed meaningful lights in America near the presenter. The programme feed was scheduled to run for at least 6 hours if you could hang on in. My first sighting of real video on Orion 1 was the 'Dallas Fort Worth Teleport' test card using NTSC 525-lines on the 25th @ 11.618GHz horizontal. It's encouraging that the Orion 1 bird that was the all singing digital sky platform is carrying extensive analogue video.

And the Newsforce SNG truck was in Cairo February 2nd and it was more welcome news. Newsforce hit the media headlines last year with their African C Band coverage of the Rwandan crisis using digital compression - this allowed the use of a small dish and still attain quality reception. Newsforce have not gone 100% into compression as the February 2 caption indicated 'EBU CAIRO NEWSFORCE SNG UKI-71 PAL-625'. This was a late night feed via Eutelsat II F4 @ 7°E albeit with sound in syncs (SIS).

The MIR space station has been in the news recently with the American Shuttle attempted docking activities. MIR can be received on standard satellite equipment subject to the system operating at a lower i.f. - as the latest extended i.f. receivers offer. There is a data downlink at 11.385GHz from the ZSSRD satellite (one of the Cosmos series) at its 16°W slot, look for lots of flashing black and white lines for evidence of an active downlink. If this can be seen then check out the 10.820-10.835GHz section for pictures, not wonderfully strong, which are down-linked from MIR via the Cosmos satellite and thence down to earth. In recent times mid morning around 1030 has been active for pictures of the crew on MIR though transmissions are random, not being helped by the inclined orbit of Cosmos. For those readers that have, like me, receivers that only have a low 950MHz i.f. then try one of the Global ADX + up-converters, intended for shifting Astra 1D signals up into the i.f. bandpass of a 950MHz tuner. The ADX units are simple to fit - merely connect in-line with the LNB input feeder and the output to the satellite receiver, powered from the LNB voltage it merely switches on and off. **John Locker** (Wirral) has received pictures from MIR but signals were not impressively strong and threshold extension was needed.

A couple of readers comment on a new channel 'Slavynaski Channel' that they saw on Eutelsat II F3 @ 16°E. **Roy Carman** (Reigate) comments on the programme content - which seems to consist of folk dancing and such rural entertainment - and confirms that the signals originate from the Ukraine and are intended to create a longing in exiled Ukrainians to return home, taking with them their acquired West European skills and knowledge. The programme starts mid evening and usually ends at 2300 on 11.596GHz horizontal, if you're into Ukrainian folk music then this is the channel for you! Roy Uses the Echosphere 8700 fed from a 1.2m offset dish with a Swedish Microwave 0.8dB noise LNB. Roy asks why there is Morse transmitted on the NHK transponder 11.670GHz PAS-1 on the 8.05MHz audio sub-carrier - can anyone help please? And **Berry Habekotte** (Holland) reports the BBC World Service TV that was carried via Intelsat 601 @ 27°W has now been renamed 'BBC Prime Service' - still remaining on the 10.995GHz vertical transponder. Berry mentions that TV SAT 2 bird at 19°W has ceased activity, the bird has been leased by Norway's Tele-Nor AS and the disused German satellite is being moved slowly to 1°W to join Intelsat 712 and the Thor satellite, thus making a hot spot in the sky for new services into Scandinavia.

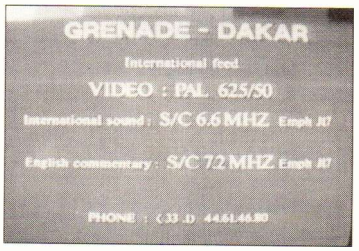
Seen on Eutelsat II F3 @ 16°E by John Locker - what or where is 'Aspell Track'?

The Parkhurst Prison breakout in January '95 was carried by this SNG (satellite news gathering) feed into Sky News on Eutelsat I F4 25°E.

Another 25°E feed, this satellite suffers inclined orbit syndrome hence variation in signal levels - compare with the Parkhurst shot. This specific feed out of Moscow to CNN Atlanta came back via Astra with a 1 second delay, equivalent to five satellite hops!

A news circuit into Associated Press, London from Israel after the suicide bombing, Eutelsat II F1 @ 13°E.

A 525-line NTSC feed from Chechyna on 16°E.



The annual Granada-Dakar race is carried in part on both Telecom and Eutelsat satellites.

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

Amateur Bands Round-up

Listening to the Amateurs

As I write, at the beginning of February, the January winds and rains have given way to milder weather, so we may hope the antennas will survive until the summer overhaul!

Silent Key

I was startled and saddened to hear of the death of **Martin Haasen OY7ML**. A fine operator and very helpful indeed to anyone thinking of visiting the Faroe Islands. The DX community and the local radio amateurs on the islands will miss him greatly.

Conditions

As to be expected, conditions are up and down; but we are seeing signs now of the bottom of the cycle, which looks to happen around the spring of next year **if** assorted varieties of crystal ball are not too far from the mark. Don't forget, since a sunspot is an essentially random thing, that while we can guess the overall pattern from past cycles, we can not say that the bottom of the cycle will happen on a specified date.

Questions

Always questions! That 'ZC6B' claiming to be in Gaza.

1. It would take around three years for Gaza to approach acceptability;
2. The ZC6 prefix is owned by the UK;
3. No documentation had been seen at the DXCC Desk as of January 18. In simple terms - forget it!

Still on that subject, I hear of another story about Mount Athos. Again, the Greeks, and this time the tale is that they know of a way to get round the difficulty of obtaining permission to operate. I'll believe that one when I hear the signal and then get a card from them together with acceptance by the DXCC Desk. Even then I'll be harbouring my own doubts!

Indoor Antennas

Almost every month I hear from someone bewailing the need for indoor antennas or asking whether it is worth even starting up if nothing can be shown out of doors.

There is no hard and fast rule that can be applied. Personal experience with an indoor dipole and later a reversible two-element beam says very definitely that due to the proximity of walls, joists and roofing material, considerable shortening will be called for to bring a dipole to resonance; as much as a foot(300mm) off each end may be needed. As for transmitting up such an antenna, care needs to be taken if it is not to become a fire risk. An indoor skywire is also vulnerable to noise; since most of the house wiring seems to find its way into the loft, electrical noise can be a serious nuisance. On the other hand, I have personally worked - not just heard - all continents on such an antenna .....yer pays yer money, and yer takes yer choice!

If you try say, a dipole, you do need to get it resonant of itself. The trick is to get a piece of coaxial cable trimmed to be a half-wave long electrically; this will then repeat whatever measurement you make as though you were actually at the 'eye' of the antenna; now you can trim the antenna to resonance, taking care to ensure that you remove the same length from each end. Once you have done this, you can then safely extend the feeder to wherever it needs to go. If you try, whether with a g.d.o. (grid dip oscillator) or an MFJ Antenna Analyser or whatever, to resonate an antenna fed by an unknown length of feeder, you will in fact be resonating the whole issue - antenna plus feeder - and you will get into a hopeless tangle! Perhaps, if you haven't got the wherewithal to do measurements on an antenna, you will be better off using an end-fed wire plus a tuner.

Letters

Top of the pile is the one from **Dennis Sheppard** in Earl Shilton, who seems to have been in the wars. Nevertheless, Dennis managed to find A45ZZ, A61AN, A92BG, KP2AD, HL1IUA, HK4DHR, LU8EEM, PY6NO, TI2IDX, T32J (a struggle to copy, this one!), T77J, UA0ABK, XE1L, YK0CN, YB3OSE, X5FRS, XQ8ABP, XX9AS, ZA1AJ, ZP5PT, 3DA0BK, 5N0GC, 9M8DB and plenty of JA/VK/ZL signals all on 3.5MHz. Turning to 7MHz, we see JA1RWC, JF1IST, LU2FYV, ZA1AJ, ZS6AJD, 7X2DG and 8R1AK.

On a different tack, but still with Dennis Sheppard, does anyone out there have details of the modification required to get the Sommerkamp FR100B receiver on to Top Band? If so please pass the details to: Dennis Sheppard, 76 Coronation Road, Earl Shilton, Leics LE9 7HJ. I seem to recall years ago that the involvement included using one of the spare bandswitch positions to connect a crystal for the first local oscillator and to wire in the coils for the 1.8MHz band which were commercially available but needed to be 'cut about' to get them in.

I made a boo-boo! **Gordon Hudson** in Livingston, West Lothian points out that G2RSA **is** in the current *Call Book*, though it was **not** issued in the original pre-WW2 series of G2+three letter calls.

Now a letter from **Mick Holtham** in the POs' Mess, *HMS Coventry* who used to be VP8CON in Mount Pleasant in the Falklands; he made about 600 contacts from VP8CON, but the logs went astray for several months so the chore of sending cards out for his contacts was delayed. However, the missing 'book of words' has now safely reached his home address, so when he gets back home, probably in mid-summer, all the cards will be sent out. The best contact was on 28MHz, not with the kilowatt merchants but with a 2E0 using a couple of watts.

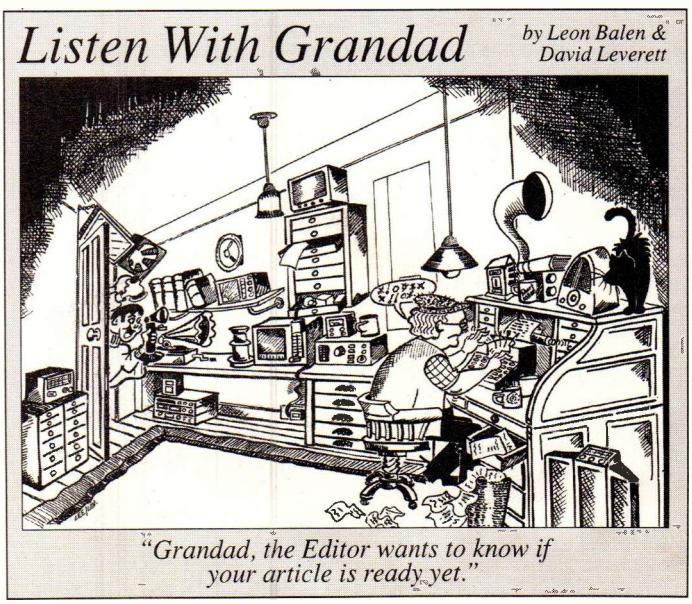
From the middle of the North Sea, **Geoff Crowley** of Aberdeen writes to fill in the details of his activity during his last period at home. Top band yielded s.s.b. signals from 4L4KK, ER2GR, F5LGE, HB9RG, I4JMY, KB3AFI, UR5QSO, UR5TFB, PA0DDB, W0ZV, WA2GBZ, YL3FW, YL3GHD, I3MAU, SM3LBN, G3XVN, G4BDX, S59A, UR7IGB, EA3GHQ, PA3GLD, SM5VOB, 4N7ZZ, GW3JXN, YU7BW, G3ZGC, G4GPW, G3FIK, G3APO and GW3JSW (I wonder whether this one was maybe GW3JSV as G3JSW is based in Arundel in Sussex). 3.5MHz showed with JA4KDX, KB3ATI, KH6ND/W7, ZL3LB, VP29EI, ZL1AXQ, T31BB, N1RFE, VK4SJP and ZL3LB. 14MHz gave VK3CR and VK8PN in QSO, DJ6QT/5O, ZB2JO, 4L4TL and J68BU. Finally, on 21MHz 4S6ST (Box 907, Colombo, Sri Lanka), 9A3LM and Z37FAD. All, as usual, on the half-sized G5RV antenna.

Now we move on to **Leighton Smart** in Trelewis; after a break Leighton has returned to the fray, and he mentions c.w. from RN1NA, EW3ELB, DL6MIM, HB9FAF, DJ2VK, ON4AEB, OK1VFT and SM6LJP plus sideband signals from CT1ESV. A flick of the bandswitch to 18MHz resulted in ZB2EO, US0HZ, HA8RJ, all on c.w. with sideband from WA2MCZ and W9LKJ.

Alan Burnett-Provan lives in Wootton Wawen - a place I knew well some forty years ago! - and he has a problem! He was listening on 7.019MHz c.w. at 2022UTC and heard a station signing BHMB; he said he was located in China. Certainly the Chinese have the ITU allocation BAA-BZZ, but I have never heard of a Chinese callsign of that form on the amateur bands. One wonders whether the decoder was reading it correctly? Can anyone out there offer any useful comments.

Finale

That's all for this time round. Send your letters please addressed to me at PO Box 4, Newtown, Powys SY16 1ZZ, to reach me by the beginning of the month.



"Grandad, the Editor wants to know if your article is ready yet."

Graham Tanner, 64 Attlee Road, Hayes, Middlesex, UB4 9JE

SSB Utility Listening

HF Sideband

Please note that I have now moved, and all mail should me sent to my new address which is listed at the top of the page. Any mail that finds its way to my old address will be forwarded to me.

Last month, I wrote about the USAF frequency changes that took place in December; I mentioned that I did not know if the ICAO h.f. networks would be changing in a similar fashion. I have since heard that they will not be changing, nor will the various VOLMET frequencies. The frequency changes only affected those 'off-route' frequencies, where there is a large concentration of military aeronautical traffic.

Antennas

Steve Dawe from Newton Abbot writes enclosing a publicity brochures from Chelton Ltd., who specialise in airborne communications and navigation equipment. His letter was in response to the notes about air craft antennas a few months back. Chelton Ltd. are based in Marlow in Buckinghamshire, just a few miles from where I work; I often pass their offices, and they have a number of strange 'contraptions' on their roof. The brochures have photographs of their building and the different types and styles of antennas they manufacture, so now I know that the 'contraptions' are actually antennas. There are also many pictures of aircraft and helicopters fitted with Chelton products.

Questions

Maxwell M from Lancaster asks if I know of any airline or LDOC h.f. stations based in the Far East. I have searched through a number of sources of information, but the only listing that I can find is in *High in the Sky*. A number of Asian and far-eastern airlines have their own h.f. networks (Air India, Air New Zealand, QANTAS, etc.), but I cannot find anything about independent LDOC stations. If anyone has any suggestions or information, I'll be glad to pass on the information via this column.

A few months back, I mentioned a request for the frequency used by 'Rescue' units when they refer to 'channel 73'. **Peter Truelove** writes to say that the correct frequency is 156.675MHz Narrow f.m., which is part of the v.h.f. Marine Band. The helicopters and aircraft involved in SAR operations, and the various ground units do have access to their own dedicated v.h.f. 'low-band' frequency, but find that the response is much better on 'Channel 73'.

Guy from Portsmouth took on the challenge of decoding some of the illegal packet transmissions on 6.677MHz recently, and sent in some print-outs of his findings (or is that 'decodings'?). During one brief period, the main station was operating a packet BBS using the callsign 'FD3GO' from locator square 'JN38mj', while another was 'FRA3NP' from 'le couer de la France' (the middle of France). These are not official callsigns, they are chosen by the operators so that they sound as if they were officially allocated. I am quite surprised that anyone can be so bold as to set-up a packet BBS like this, surely it would be relatively easy to d.f. it and close it down. Guy's listing also shows several Italian stations connecting to the BBS, others sending the packet equivalent of 'CQ', and even one station digi-peating via another station!

Table.1: US Air Force GHFS frequencies (MHz)

5.065	Cosmos Control calling *Cosmos 2*.
5.628	Tokyo ATC and Honolulu ATC working flights crossing the Pacific ocean. Airlines heard were Korean, Japanese, Cathay Pacific, Singapore, Asiana and American Airlines.
5.643	Singapore 7296 working Auckland ATC reporting its ETA to Auckland as 09.30Z. Also heard were QANTAS 44 and Ansett 74 working Sydney ATC.
5.753	Possible Regular Army or Territorial Army training network operating during weekday evenings.
6.741	Cosmos Control calling *Cosmos 3* and *Cosmos 7*.
8.743	Rogaland Radio, Norway (LFL5) working an unidentified British ship with a conversation in English regarding moving cargo from Norway to England.
11.460	SAM 970 (89th Airlift Wing C-137B 58-6970) working Andrews VIP whilst *en-route* to Rwanda. '970 reported that they would 'not be using the new mods on the aircraft'. They also referred to their SATCOM frequency as the 'Cactus 3 secure data' frequency.
13.974	USN MARS shore station NNN0TDU working ship station NNN0CRK (USS *Ponce/LPD-15*), but suffering badly from static interference, so they QSYed to 14.4415MHz (the MARS 'calling' frequency).

HMS Nottingham, a type 42 Sheffield class. Displacement of 3660 tonnes, 125m in length. Note the Lynx helicopter at the stern

Useful Blocks

Scotty from Tonbridge writes requesting information on publications that list the callsigns for merchant ships. I am only aware of one source of this information, however it is very expensive. The ITU (International Telecommunications Union) produces two books that would appear to contain the required information. The first of these is the *List of Ship's Callsigns*, which gives you the ship's name when you know its call letters. A recent copy of this book covered over 16 000 ships. The second book - the *List of Ship Stations* provides callsigns (and many other things) when you know the name of the vessel. A few years ago, these books cost £44 and £58 respectively. I do not know where you can get these books in the UK, maybe you need to contact the ITU directly; their address is: ITU, Sales Service, Place de Nations, CH-1211,Geneva 20, Switzerland. If anyone can offer any other suggestions, I will gladly pass them on through this column. I wonder what happens to all the old copies of the books when a new edition is published?

Traffic Log

R Keary writes to ask why I don't list dates and times in the Traffic Log. There are a number of reasons for this. Primarily, it would look very strange to see some entries with dates and times, and many without such details. From the many logs that I receive each month, very few list a date an time for every entry. Unfortunately, the ones that I want to put into the Traffic Log tend to fall into the category of 'no date and time' supplied.

My original intention for the Traffic Log was to give you an idea of what other frequencies have been active, what kind of traffic can be heard on them, and maybe tempt you into trying some of them yourself. I see little point in printing long lists of traffic on the well-known ICAO h.f. networks, the USAF GHFS frequencies, or the world-wide VOLMET frequencies. All these are very easy to hear and all the frequencies are easily obtained from numerous sources. What makes interesting reading is a entry involving 'odd' or unusual frequencies, strange messages being passed, unusual frequencies heard due to abnormal propagation conditions, or cases where stations identify a particular frequency by a certain channel number.

It is difficult to justify putting a line in the traffic log such as '1.234MHz unknown station working an unheard station in a foreign language'.

Perhaps if those submitting copies of their logs to me could make sure that every entry contains date, time, frequency, all callsigns involved, and as much information about the contact as possible.

C.M.HOWES COMMUNICATIONS

Mail Order to: Eydon, Daventry, Northants. NN11 3PT
☎ 01327 260178


RX Audio Filter £29.80


Morse Oscillator £19.90


Speech Processor £28.70


Digital Readout £74.80

These prices are for electronics kits plus hardware

There are lots more kits in our free catalogue!
Please send an SAE for your copy

Top Value SWL ATU

The **HOWES CTU8** SWL ATU covers medium and shortwave bands (500kHz to 30MHz). Increases wanted signals by providing impedance matching, and at the same time reduces spurious signals and interference with "front end" selectivity for the receiver. Kit contains case and all parts. Reviewed in the December issue of SWM. Great performance, easy to build. The top value general coverage receiving Antenna Tuning Unit!

Factory Built: £49.90 **Kit: £29.90**

The famous HOWES Active Antennas


AA4

AA2 150kHz to 30MHz ACTIVE ANTENNA

The neat compact answer for those with limited space, holiday use, mobile operation etc. Two selectable gain settings, local or coax powering (12 to 14V). Good strong signal performance, IP3 +38dBm. Easy to build, and much liked by customers!

AA2 Kit: £8.90 **Assembled PCB Module: £13.90**

AA4 ACTIVE ANTENNA FOR SCANNERS

Covers 25 to 1300MHz. Broad-band performance in a neat, compact package. Just over 16 inches long. Excellent performance in a small space!

AA4 Kit: £19.90 **Assembled PCB Modules: £27.90**

AB118 AIR-BAND ACTIVE ANTENNA

Optimised for long distance reception on 118 to 137MHz air-band. Tuned antenna with pre-amp & band-pass filter. Hear ground stations you've never heard before!

AB118 Kit: £18.80 **Assembled PCB modules: £25.90**

HOWES KITS - Great Projects to Build!

MULTI-BAND SSB/CW RECEIVER

The **HOWES DXR20** covers 20, 40 & 80M bands plus any other HF frequency with optional plug-in modules. The photo shows the receiver built with **DXR20** and **DCS2** ("S meter") kits and **HA20R** hardware pack (case etc.). Excellent performance and compatible with many of our transmitter and accessory kits. Optional band module kits include 160M, 30M, 15M & 10M amateurs plus 5.45MHz HF airband at £7.90 each.

DXR20 electronics kit: **£39.90**,
DCS2 "S meter" kit: £10.90, HA20R hardware pack: £28.90

PLEASE ADD £4.00 P&P, or £1.50 P&P for electronics only kits.

HOWES KITS contain good quality printed circuit boards with screen printed parts locations, full, clear instructions and all board mounted components. Sales, constructional and technical advice are available by phone during office hours. Please send an SAE for our **free catalogue** and specific product data sheets. Delivery is normally within seven days.

73 from Dave G4KQH, Technical Manager.

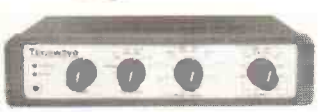
QSL COMMUNICATIONS

UNIT 6, WORLE INDUSTRIAL CENTRE, COKER ROAD,
WORLE, WESTON-SUPER-MARE BS22 0BX
TEL: (01934) 512757 (0850) 707257 FAX: (01934) 512757

AOR AR-3000A
100kHz
2036MHz
PHONE

AOR AR-3030 30KHz-30MHz
AM/FM/SSB/CW/FAX
PHONE

YAESU FRG-100 50kHz-30MHz
ALL MODES
PHONE



TIMEWAVE DIGITAL AUDIO FILTERS
DSP-9 VER.2 **£189**
DSP-9 PLUS **£239**
DSP-59 PLUS **£299**

AOR AR-1500EX
500kHz-1300MHz
AM/FM/SSB
PHONE

AOR AR-8000
SSB/NFM/WFM/AM
500kHz-1900MHz
PHONE
CU8232 IF UNIT
NEW STOCK NOW IN.

EXTENSION SPEAKER
W83XH54XD76MM
8 OHMS
5 WATTS
£7.99 + £2 p&p

DRAKE R8E
100kHz–30MHz
ALL MODE
100 MEMORYS
PHONE

SECONDHAND LIST

ERA Microreader	**£120**
NET SET Pro-46 As new	**£149**
BJ-200 As new	**£89**
SONY ICF-PRO80 As new including VHF converter	**£215**

ANTENNAS
G5RV Half size **£14.95** + £4 p&p
G5RV Full size **£16.95** + £4 p&p
DISCONE 25-1300MHz **£49** + £5 p&p
VECTRONICS AT 100
ACTIVE ANTENNA **£79.95** + £4 p&p

OPTOELECTRONICS HANDI-COUNTERS
ALL COUNTERS ARE SUPPLIED WITH NICADS
NICAD CHARGER AND ANTENNA

2300	Freq counter with display hold 1MHz–2.4GHz	**£135** + £5 P&P WITH FREE CASE
2810	FULL RANGE COUNTER 10HZ–3GHZ	**£178** + £5 P&P WITH FREE CASE

EARTH RODS 4FT LONG, ADJUSTABLE BRASS FIXING
SOLID COPPER £10.99, COPPER PLATED STEEL £8.99, p & p £2.50

2 EASY TO OPERATE SCANNERS COMPLETE WITH NICADS, CHARGERS, ANTENNA AND FREE P&P.
BEARCAT UBC220XLT 66MHz–956MHz **£199**
BEARCAT UBC65XLT 66MHz–512MHz **£99**

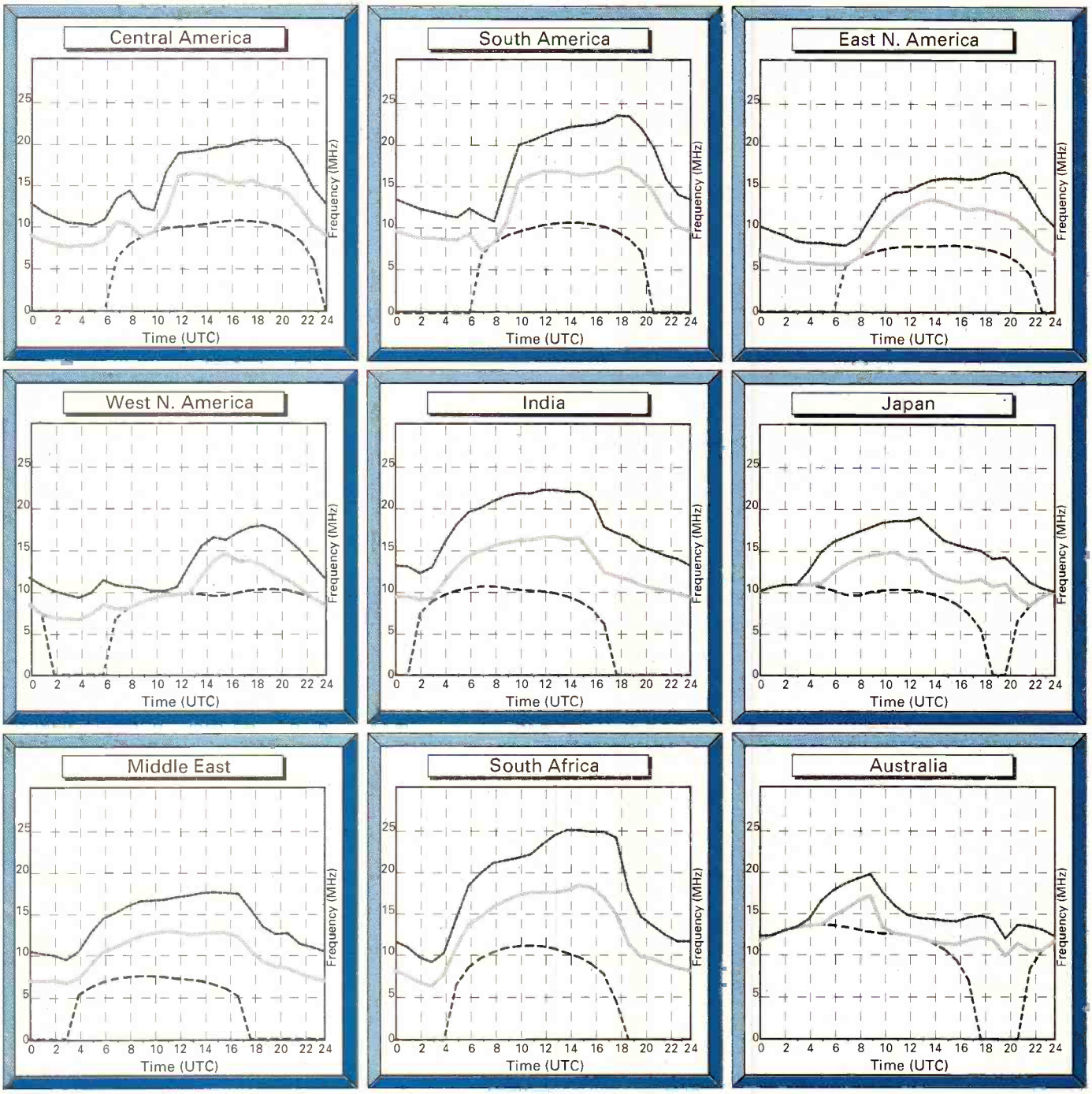
QSL CARDS SEND LARGE S.A.E. FOR SAMPLES AND PRICE LIST

FAX ORDERS TAKEN 24HRS A DAY

Jacques d'Avignon VE3VIA

World Propagation Forecasts April

Circuits to London



How to use the Propagation Charts.

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

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

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

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

Good luck and happy listening.

MOMENTUM COMMUNICATIONS

MCL 1100 DATA DECODER

SEE REVIEW IN THE MAY ISSUE

The MCL 1100 Easyreader Data Decoder will automatically make sense of some of the strange noises that you can hear on your H.F. Radio Receiver enabling you to make FULL use of your equipment. The MCL-1100 processes data transmissions without the need of a separate computer and displays a full screen of text on your video monitor.

Why make-do with one or two lines of information as offered by other manufacturers. And it's designed and manufactured in the U.K.

STANDARD FEATURES:

- SMARTLOCK system for easy tuning.
- Full screen of readable text with on-screen tuning indication.
- Automatic decoding of RTTY, CW, FEC (NAVTEX) and ARQ.
- Auto or manual selection of transmission speeds.
- Extremely rapid lock onto signal.
- Connection for a parallel type printer.
- Made in the U.K.

★ ***Please note UHF models no longer available*** ★

PHONE EASYREADER HOT-LINE FOR SPECIAL STARTER PACK DETAILS

☎ 01384 896879

EASYREADER STILL ONLY £255.00 inc. VAT + Postage

Authorised Dealers Martin Lynch Lowe Electronics ARC

6 & 7 Clarkson Place, Dudley Road, Lye, West Midlands DY9 8EL

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

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

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

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

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

Please add £7.50 to the above prices for carriage by fully insured First Class Postal delivery (default method).

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

Professional users – please ask about our new CODE30 DSP unit available now! (Piccolo down to -12dB S/N!!) Prices start from £1775 (includes all options).

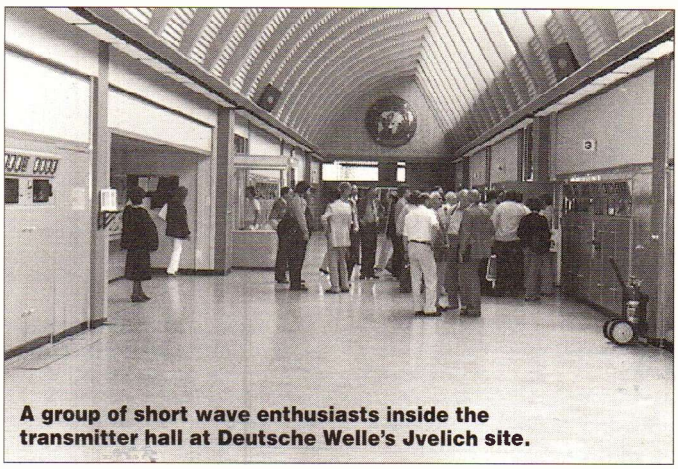
HOKA ELECTRONICS (UK)

Sales Office: Ntech Communications, 8 The Crescent, Willingdon East Sussex BN20 9RN · Tel/Fax: (01323) 483966 · Mobile: (0850) 545871

Peter Shore, c/o SWM Editorial Offices, Broadstone

Bandscan

Europe



A group of short wave enthusiasts inside the transmitter hall at Deutsche Welle's Jvelich site.

Medium and long wave DXers have had less chance of catching two European countries since the beginning of the year. On January 4, Norway stopped using 216kHz from the transmitting station at Klœfta, near to the capital, Oslo.

Norway's equivalent of the BBC, NRK, said that the 40-year-old transmitter was expensive to run and maintain, and that coverage of the nation's fishing fleet is adequate from the high power medium wave transmitter on 1314kHz. That 1200kW transmitter at Kvitsøy carries P1 and, between 1900 and 1930UTC, the external service, Radio Norway International (including English on Sunday).

Further south, Austria's national broadcaster ORF closed all its medium wave transmitters on January 1. ORF says that throughout the country f.m. services reach all the population and therefore the expensive medium wave transmitters are no longer needed. Two 600kW transmitters near Vienna operated on 585 and 1476kHz, and a 25kW sender at Lauterach operated on 1026kHz.

And there is another hole on the long wave dial: 261kHz carried Radioropa from a site at Burg in the former East Germany. Since the end of November 1994 that transmitter has been silent. Radioropa succeeded Volga Radio and Radio Russia, which both served Russian (and before that Soviet) troops in eastern Germany on 261kHz.

But here in Britain, medium wave is not dead. Anyone tuning to 1053 and 1089kHz during January and early February will have heard test transmissions from Talk Radio UK. This new national commercial station uses the old BBC Radio 1 frequencies, and some of the announcements during the test transmissions were calculated to confuse unwary listeners. In a style reminiscent of the dinner-jacketed announcer days of the BBC, listeners were told that the Corporation had lost the two frequencies as a result of a governmental foul-up.

The launch of Talk Radio UK was much hyped in the national press, with the tabloids comparing the station to talk radio in the United States where 'shock-jocks' rule the airwaves. Any worries that might have existed pre-launch evaporated on the first day, however, with the most shocking items concerning chocolate bubble bath and the possible introduction of ID cards in Britain.

Not many private broadcasters with local f.m. stations feel the need to branch out internationally and start a service on short wave. But Prague's Radio Metropolis has done just that. First heard at the end of November last year, Metropolis has been testing throughout the day, including:

0700-0755 on 9.455MHz to north-east Europe
0800-0855 on 5.905MHz to central Europe
0900-1055 on 9.47MHz to the UK and north-west Europe
1100-1255 on 5.905MHz to central Europe
1300-1400 on 5.905MHz to western Europe
1600-1755 on 5.94MHz to south-east Europe
1800-1955 on 7.25MHz to North Africa and the Middle East
2000-2255 on 7.305MHz to North America
2300-0100 on 6.20MHz to North America

The station invites reception reports to: Radio Metropolis Prague, Jeseniova 38, 13000 Prague 3, Czech Republic.

It is unclear what the station's owners hope to achieve by introducing an international service. Broadcasts are planned in English, Czech, Russian and German, but who will listen, and what advertisers will support a small European short wave station? Being successful in an expanding f.m. market certainly does not guarantee success on the h.f. bands and in any case can a country with a population of a little over 10 million justify two international stations?

The Czech Republic's governmental international station lost the use of its high-powered transmitters in Slovakia early in the year. Radio Prague made extensive use of the 250kW senders at Rimavská Sobota but can no longer afford to pay for time on them in addition to the 100kW transmitters it uses in the Czech Republic. The new English language schedule is:

0700-0730 on 17.485 and 7.345MHz
1130-1200 on 9.505 and 7.345MHz
1700-1730 on 9.42 and 5.93MHz
1800-1830 on 9.42 and 5.93MHz
2100-2130 on 7.345 and 5.93MHz

Short wave remains important during times of crisis and can reach audiences world-wide when local information sources fail. Radio Bosnia Hercegovina has appeared on the short wave bands once more, using 7.108MHz throughout the day and night. The station had been unheard between May and December 1994.

Radio Luxembourg is absent from its long-established 49m band frequency of 6.09MHz on which has been heard the station's French-language service. Reports suggest that the station will not reappear on short wave, concentrating on satellite and f.m. interests instead.

Radio Netherlands is swapping time on its Madagascar relay station with Deutsche Welle. DW is using the Dutch relay to beam in to central Africa on 11.765MHz at 0500 to 0550, while Radio Netherlands is using DW's Nauen transmitter to reach north-west Europe, including the UK, on 7.13MHz between 1130 and 1325UTC.

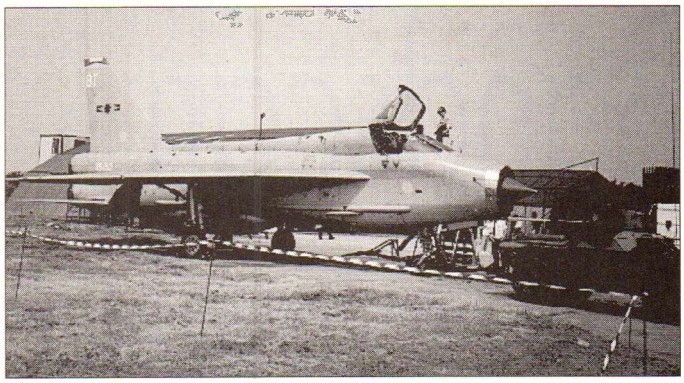
Deutsche Welle's German transmitting stations at Wertachtal, Juelich, Nauen and Koenigs Wusterhausen are under review at the moment. It is likely that the Jeulich site (not far from the station's headquarters in Cologne) and the Koenigs Wusterhausen site (in the eastern part of Germany, and a former Radio Berlin International station) may be closed. Significant investment would be made at Nauen, outside Berlin, including new 500kW transmitters and a rotatable antenna perhaps similar to that installed at Radio France International's Allouis site a couple of years ago.

I have only scratched the surface of an enormously busy and complex radio continent, but limits on space prevent more from being included. But I'll be back with more news from Europe in three months. Until then, good listening!

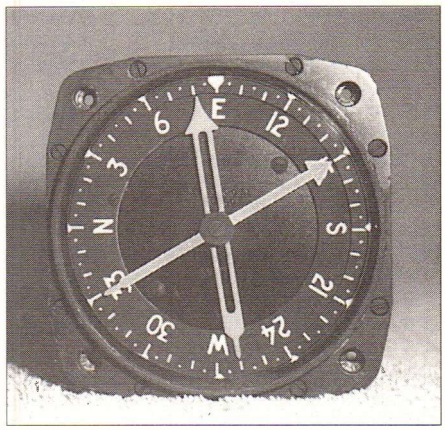
Deutsche Welle's headquarters in Cologne.

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

Airband



Lightning at Cranfield.
Christine Mlynek.



Radio magnetic indicator.
Christine Mlynek.

ADF Controller.
Christine Mlynek.

Now for the moment you've all been waiting for: the answer to the Christmas Quiz (see January '95 'Airband'). The registration of the subject aircraft was almost visible and so it should have been easy. Unfortunately, there was a catch! I asked for the native and English translations of the aircraft's name. It was no trouble to resort to the reference books and recognise the PZL-Warszawa 104 *Wilga*. This Polish aeroplane is made in Warsaw, hence the manufacturer's name.

Trouble is, those textbooks translate the aircraft type incorrectly as 'Thrush'. Both Polish and Russian for thrush is *drozd* and it is possible that our name for this bird is derived from mispronouncing this word. *Wilga* on the other hand is actually an oriole, which is a member of the crow family.

I must therefore disappoint **Steve Blanchard** (Daventry), **A. Davies** (Crowle) - hope I've read the name correctly, **John Haswell** (Sundridge), **K. Holliday** (Norwich), **Ronald Hynd** (Dalkeith), **Raymond Lewis** (St. Albans), **James McLachlan** (Glasgow), **R. Michelin** (Cheltenham) - three identical entries!, **Colin Nixon** (Stornoway), **Howard Turner** (Plymouth), **Michael Williams** (Redhill), **N. Winter** (Hull), **Redvers Wrigglesworth** (Bampton), and **G. Youngson** (Chelmsford). Honourable mention goes to **Darren Bruton** (Birmingham), aged 15, who researched all the variants of the type. Disqualified, I'm afraid, was **R. Spooner** (Darlington) who forgot to mention the name.

The remaining correct entries were subjected to random selection, which chose the runners-up as **M.C. Darke** (Reading), **Jason Meaden** (Ontario), **W. Rozycki** (Kinross) and **Graham Tanner** (Harlington).

The winner is **Jim Wright** (Bedford) to whom the Editor will be sending a little something. To all of you, many thanks from me and Chris for the kind seasonal greetings that you sent with your entries. As they say in Polish, *dziekuje*. There's no prize for pronouncing it, nor for translating Mlynek - hope Chris forgives me for asking! I'll give the answers if anyone really wants to know!! Steve Blanchard mentions his time in the Royal Observer Corps (stood down in 1991); the HQ where he served near Rugby is now a disco!

Information for Pilots

Jim takes the opportunity to ask a question about airfield elevations, as listed in the official *En Route Supplements*. For example, Luton's height above mean sea level appears as 526 in a recent RAF *Supplement*, 525 in an older version and also a recent copy of *Pooley's*, 520 in the Aerad *Supplement* but as 525 in the let-down plates from the same source with, more specifically, 515 at the 08 threshold and 509 at the 26 end. All are in feet, of course, since that's how your altimeter is calibrated.

I don't think there's anything to worry about. First, approximating to the nearest few feet won't make a difference and anyway it depends on exactly where you measure it - airfields aren't flat! The threshold elevations are what matter most for landing, and sometimes threshold QFE is given a specific mention in weather reports, particularly if the runway has a pronounced slope.

Jim tried the calculation '1mb = 30ft' on the difference between QNH and QFE and came up with 570ft! I tried this approximation on an altimeter in my museum. In fact, a 40mb difference gave a change of 1050ft (not 1200ft) in indication. In other words, 1mb = 30ft is an easily remembered rule of thumb but is actually out by about 12.5% as the true value should be closer to 26.25ft per millibar.

Information for Passengers

Jim sent me another letter quoting the rules imposed by certain American airlines about the use of electronic equipment in flight. Strangely, despite coming under the same regulations and whilst flying similar aircraft, the various carriers have slightly differing rules. Furthermore, there are extra restrictions for take-off and landing. This is strange to me, especially as take-off is the manoeuvre least dependent on radio-navigation aids.

I must stick to my earlier recommendation as endorsed by the CAA in this country. Don't try to use any but the lowest-powered electronic equipment - that just about restricts you to wrist-watches and simple l.c.d. calculators. Don't operate any radio equipment (cellular 'mobile' telephones included). Remember - if a problem does arise, the crew won't necessarily realise that a passenger is causing it, and even if they do, they won't have valuable time to waste in looking for you when they're supposed to be concentrating on flying the aeroplane!

Information Sources

Despite making the situation clear I still receive requests for the *Airband Factsheet*. I don't have a photocopier, so you **must** apply to the Editorial Office in Broadstone (see the Masthead on the Contents Page of any issue). Without a pre-paid, ready-addressed return envelope you might not get a reply at all! An international reply coupon can be sent instead of stamps if you live outside the UK. Meantime, for **Stephen N. Picker** (Carrickfergus) here is the address of 1 AIDU, RAF Northolt: West End Road, Ruislip, Middlesex HA4 6NG, Tel: 0181-845 2300.

The **North Norfolk Airband Group** will be of interest if you live in the area. **Tim Christian** (North Walsham) says that meetings are monthly on the last Friday of each month at 1930 local, held at 'The Jolly Farmers,' Swanton Abbott. Tim will let us know when the next edition of his h.f. frequency list is available; this issue might be produced on computer disk as well as paper, but such a compact booklet takes up little room on the shelf that has to be balanced against having to turn the computer on! Computers tend to give receivers audible indigestion. There is also the problem of your software being able to understand Tim's software's format. I'll publish the details once they're known.

Whenever VOLMET is mentioned a debate starts about its meaning. In the January edition I listed VOLume METeorological report in the abbreviations section. **A.G. Robertson** (Perth, Australia) reminds us of another popular interpretation: *vol* being French for flight. As VOLMET only states actual conditions on the ground at aerodromes, airframe icing is not mentioned. For light aircraft, the telephone Airmet service (available in the UK) does indicate the freezing level. It's expensive to dial up, but, if readers would like details, write in and I'll cover the topic in a later issue.

Frequency and Operational News

From the CAA comes *GASIL* 1 of 95. A new d.m.e. is at Hawarden, ident HDN, response on 1.122GHz. Shawbury Lower Airspace Radar Service moves from 124.15 to 120.775MHz. There's a new term for reporting an airmiss. Pilots would report to controllers by announcing the word 'Airmiss' over the radio and controllers could file an 'Aphaz' (aircraft proximity hazard). The introduction of Aphaz was only recent, before then controllers were not

permitted to acknowledge an airmiss that the pilot couldn't see. Now both pilots and controllers are permitted to file reports and the common expression 'Airprox' (aircraft proximity) replaces the previous jargon.

Graham Tanner (Harlington) sent a list of LATCC frequency changes and I've been updating you on these in the months during which they were expected to happen. The final changes are due in April, but beware that schedules do change! Anyway, here's what's expected. 131.2 becomes 129.375; 132.8 becomes 134.75; and 133.6 becomes 136.4MHz for a frequency in the extended allocation.

'Reach' out of Mildenhall? Probably C-5 Galaxy or C-141 Starlifter USAF transports, but if you know better, tell me so that I can make **S.M. Rooney** (Leigh-on-Sea) happy.

In the Cockpit

You wanted a closer look at typical aircraft equipment and Chris has produced our first two photos. They show the Marconi 6409A Automatic Direction Finder (ADF) controller and, to go with it, the Smiths ACP 1500/1 Radio Magnetic Indicator (RMI) exhibited in my Museum. These are typical of equipment in current airliner use, light aircraft tending to have similar but slightly simpler versions. More recently, the control boxes have shrunk and been equipped with l.c.d. or l.e.d. displays and the mechanical indicator is now displayed on a television screen, but the principles are unchanged.

This equipment tunes in to non-directional beacons (n.d.b.s) in the 190-1750kHz range. Some of these beacons fall in the medium wave and can be heard on domestic and car radios! They have continuous carrier wave transmissions, with their Morse callsigns audible by amplitude modulation. They are so-called because they can be received equally well from any direction. In the photo, the Westcott beacon near Aylesbury has been tuned in on 335kHz and its Morse ident (WCO, di-dah-dah, dah-di-dah-dit, dah-dah-dah) can be heard in the pilot's headset. The tuning is done by turning the three large knobs at the bottom of the set, which cause the numbered drums to rotate in the window.

On the left, the small knob controls gain (just like on any short wave receiver), and selectivity is by the Sharp/Broad toggle switch at the top. The other toggle turns the b.f.o. on or off - usually unnecessary since the ident. is amplitude modulated. The small knob on the right would adjust the beat note. Finally, manual control of the antennas is possible by the top left Loop knob and the top right, four-way switch. The two hat-shaped lumps just above and to each side of the window are dial lamp holders, and four quick-release fasteners are accessed by the screwdriver slots in each corner.

Looking at the RMI, it consists of a compass card that indicates the aircraft's magnetic heading. It is read against the lubber line (index mark) in the instrument's 12 o'clock position. We are currently heading due east.

Two pointers are also seen. No. 1 pointer is a solid arrow, No. 2 is an open arrow made of two parallel lines. There are in fact two ADF receivers on board, coupled to the No. 1 and No. 2 pointers respectively. In a large aircraft, there will be duplicate RMIs - one for each pilot. The pointers actually point in the direction of the n.d.b.s to which their respective ADF sets are tuned. No. 1 ADF is tuned to a beacon ahead and to the right, in the aircraft's 2 o'clock whereas No. 2 ADF is picking up a different beacon ahead and 10° left of our position. For the way in which this information is used, and to find out about the antennas, you'll have to wait till next month.

The next three deadlines (for topical information) are April 13, May 12 and June 16. Replies always appear in this column and it is regretted that no direct correspondence is possible. Genuinely urgent information/enquiries: 0181-958 5113 (before 2130 local please).

Abbreviations

b.f.o.	beat frequency oscillator
CAA	Civil Aviation Authority
d.m.e.	distance measuring equipment
ft	feet
GASIL	General Aviation Safety Information Leaflet
GHz	gigahertz
h.f.	high frequency
kHz	kilohertz
LATCC	London Area & Terminal Control Centre
l.c.d.	liquid crystal display
l.e.d.	light emitting diode
mb	millibars
MHz	megahertz
QFE	altimeter pressure setting, reads zero when on aerodrome
QNH	altimeter pressure setting, reads height above sea level

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

Scanning

This month I'm going to have a look at some pretty interesting letters sent in on a variety of topics - each of them useful to scanner enthusiasts in general. First, my thanks to **John Hitchon** of Gairloch. John is an enthusiast of the 'SSB Utility' column but found my January piece took his fancy! I did ask for information on SAR Comms for possible publication in a book and John was amongst the first to respond. Although 'Scanning' deals with mainly v.h.f. and u.h.f. comms, I'm sure that some h.f. would be allowed to creep in now and again!

Can any of the readers out there supply frequencies for Norway, Sweden, Germany and Netherlands SRCCs? (Search And Rescue Co-ordination Centres). These can operate on h.f. or v.h.f. and u.h.f. - in this case it doesn't matter! I do have some - but I'm sure my own files are far from exhaustive. Another letter, tying up neatly with John's, comes from **T.C. Hunter** of Largs, and is concerned with SAR Comms. Help is needed here! Can any reader out there assist with the following IDs?

Rescue 144	Not listed as a callsign. ID required.
Rescue 125/127	Transferred to where?
Rescue 115	Who?
Rescue 166/7/8	Transferred to RAF Wattisham - true?
Rescue 190/1/2-	Disbanded 30.06.94 but still heard on h.f. Where located?
Rescue 193	Previously stationed Brawdy. Now at Culdrose? Confirm.
Rescue 50	ex-RAF Odiham. Not listed. ID required.
Pedro 16	Callsign. Who?
Rescue 8960	Callsign. Who?
Alpine 95	What MRT is this?

With regards to the question as to Coastguard India Juliet - that's a Sikorsky from Lee-on-Solent. Other HM Coastguard Helicopter calls are as follows:

A C - Lerwick & Sumburgh.
M U - Stornoway.
O C - Sumburgh.
I J - Lee-on-Solent.
I G - same.
J J - same.

If you know - drop me a line! Also, any h.f. SAR Comms info you may have, world-wide and European, would be appreciated.

Now, to a letter from **Darren Bruton** aged 15 of Great Barr in Birmingham. Darren owns an MVT-7000 and is having problems with programming in frequencies of eight digits! These are sometimes quoted in books and magazines but will not 'go in' to a scanner. Well, Darren, my own experience is that a frequency such as, for example 156.000 is easy - whereas 124.67525 is not! In my opinion the 'knock off' or 'round up' would be to '6' the frequency.

In other words: instead of trying to cram all the digits in, just go three behind the decimal point so, for example, 124.67525 simply becomes 124.675. The accuracy isn't impaired providing the kHz steps are accurate for that band. Most publications put them in for the sake of it, when - in reality - you just need the three behind the decimal point. You will also need to ensure that the kHz steps for the band are accurate. For example, frequency spacing in the 225.000 - 328.000MHz Fixed and Mobile band is 25kHz - clearly no use expecting brilliant results if your scanner is set at 75kHz steps!

With regard to your frequencies and decoding same on a PC 486 - on 'Heli-Tele' channels - I would advise very strongly against it! In fact, I'd even go so far as to say DON'T! The decoding of these things are beyond scanning so try the *Decode* column - but don't be surprised when you are told you shouldn't! However, you do neatly conclude your letter with the comment that 'sensitive' frequencies should be put in - after all, they are available in publications like *The UK Scanning Frequency Guide*. Now, I wonder what the authorities would make of that used in my defence?

Speaking of which, an interesting letter from **J. Harkness** of West Lothian that again outlines the attitude of the authorities towards listening and scanners. This time, a mistake made after hearing a message on police frequencies. Then passing the message on to a neighbour.... First off, this is definitely a case of 'third party traffic' - and the visit from the local police would be - therefore - justified. I know that it was probably harrowing but you don't say if anything was seized or if you were charged. If not - **YOU WERE VERY LUCKY!** You talk of their broadcasting more details - I'm sorry, but I can't agree with you. The police frequencies should be secure and any eavesdropping is punishable by law, despite the fact that it goes on.

Frequency lists are freely available for the police in many publications - but I value my own freedom too much to publish them, by name and location, in here! The Editorial policy of the magazine is, I think, not to court too much attention - and that's something I have to abide by.

It is very easy nowadays to think of the authorities as 'Big Brother' and crippling our hobby but that's not strictly true. Criminals do use scanners to stay one jump ahead of the law - and that's not good for any of us. The authorities can be, sometimes, over-zealous but I have yet to hear of an average scanner owner being 'visited' for simply listening in the safety of his own QTHR. Most cases of police action have been after flaunting a scanner i.e. in a vehicle, as a response from a source - such as the case of the video cameraman who followed a fire brigade around and was always on the scene as reported here last year - or because, like you did, they passed on third party traffic. Third Party Traffic - the interception of same - is serious. Besides, how much distress can be caused even if the intentions were 'for the best'?

As a ex-RNLI crewman I know, for certain, that someone passing on an overheard message (and getting it wrong based on the most basic of heard facts) could cause untold distress and misery. Sorry if I don't sound sympathetic on this. I'm not.

Product News

Nevada's Mike Devereaux keeps me in touch with developments. Two items of use for scanner users are a low noise wide-band GaAs f.e.t. pre-amp, the SP-55 from Scanmaster. This piece of kit claims to be able to boost-up incoming signals. It has a variable gain control which, it is claimed, will provide the right amount of amplification for signals - 0 to 20dB+ according to the data supplied. It is useful for frequencies in the range 24MHz through to 1.3GHz. It **CANNOT** be used with a transmitter - be warned!

The other - and in my opinion - more interesting accessory is the Scanmaster SNF-170 adjustable r.f. notch filter - now this I could really use here in Oxford! The accompanying blurb suggests it could possibly be the next bit of kit I buy! Many antenna types encourage interference such as blocking and signal overloading - active antennae spring straight to mind! Band II (v.h.f. f.m. BC) is one culprit but I find taxi stations are just as guilty. This piece of kit claims to be able to filter these out, working as a high-pass filter as well.

I particularly like the honesty of Nevada and Scanmaster who suggest that obtaining extremely low loss results needs multiple cavity - i.e. expensive! - filters but that the SNF-170 produces good results. It has an insertion loss of <1.5dB with a notch of 30dB approx, an attenuation of -7dB at 1.7MHz and below. Impedance is 50Ω. Whichever one you choose, enhancing your station should mean enhancing your reception - and that must be the aim of all of us, surely!

Frequency News

Last month I gave you 'samplers' of stations heard on v.h.f. Lo. They are out there - but you do need the conditions, of course! This month I'm going to look at some 'tasters' within the mid-portion of the range. This time of the year, with gales still in force in many areas, there is plenty of call for the riggers and linesmen of the electricity companies. These are UK frequencies, used by the CEGB - Central Electricity Generating Board - which is now known as Powergen.

Between 139.562 and 140.468 Simplex. 6kHz steps.

Between 106.562 and 107.468 Duplex. 6kHz steps.

I would hazard a guess that the best time to listen to these is during a powercut or when lines are down. Some electricity boards also use helicopters for line surveys - does anyone have frequencies for these? Operations will be from mobiles, hand-helds and from helicopters at times. Most ops will be local and callsigns are various so the things to listen out for are local identifiers i.e: in my own area in Wales I listen for village or town locations and key words such as 'transformer fault', 'overload' and so on! Like most scanning activity it is a matter of listen and keep on listening.

Also, in the February column I gave National Ambulance Codes in response to a letter from a reader in Mildenhall. Another - though this time anonymous - reader has sent me an 'update' as used in the West Midlands. He also cites some interesting callsigns that can be heard. I reproduce them below. He also sends in radio codes - but with nearly 70 of them I haven't the space

to publish! The callsigns, however, are as follows:

Phoenix 1 - Special Casualty Access Team currently mobile and using a Ford Maverick 4x4 vehicle.

Mike Oscar 3 - Central Accident Resuscitation Team. These are doctors and nurses who give up their free time as volunteers. Heli Med 03 - Air ambulance and air ops support vehicle.

Zulu - Any paramedic motorcycle.

Tango - Training vehicle.

Romeo 1 - Paramedic Training vehicle.

Metro 1 - West Midland Ambulance Service Chief Executive. The control unit vehicle operated by the St. John's Ambulance in the West Midlands carries Brigade v.h.f. radio sets, West Midlands v.h.f. set and a cellular 'phone. Her callsign is Sierra Juliet 1. Frequencies were not given but my own information is as follows on West Midlands and Birmingham area: 166.275 + 171.075 / 166.287 + 171.087 / 169.362 St. Johns CH.1 / 169.387 CH.2 / 169.350 St. Johns. You may find others - and I would be pleased if you would send them on for reference and logging.

Meanwhile, that's it for another month! If you can assist with the info requested then please do so. Until next time, good listening and 73 - catch you down the log sometime soon.

LM&S Equipment List

LM&S for $February, #March, *April'95.

\#* Tim Allison, Middlesborough: Lowe HF-225 + r.w.
* Charles Beanland, Gibraltar: Sangean ATS-803 + a.t.u. + 6m wire or Howes AA2.
$#* Darren Beasley, Bridgwater: Yaesu FRG-100 + Hex loop or a.t.u. + 15m wire.
$# Clive Boutell, Dovercourt: Trio R-600 + a.t.u. + half size 5RV or loop.
* Paul Bowery, Burnham-on-Crouch: Sangean ATS-803A + 20m wire.
$#* Vera Brindley, Woodhall Spa: Sangean ATS-803A or Sangean SW60 + r.w.
#* Steve Brown, Newcastle-upon-Tyne: Sony Hi-fi + 40m wire or Morphy Richards 9 band portable.
$#* Kenneth Buck, Edinburgh: Lowe HF-225 + r.w. in loft or s.w. loop.
$ Andy Cadier, while in Majorca: Walkman radio.
$#* Bill Clark, Rotherham: Sony ICF-2001D + built-in whip or r.w.
Frederic Collin, Tokyo, Japan: Sony ICF-SW55 + AN-1.
$#* Robert Connolly, Kilkeel: Trio R-1000 + Sony AN-1.
* John Court, Birmingham: Sound Lab 12 band portable + 6m wire.
$* Geoff Crowley, Aberdeen: Yaesu FRG-100 + a.t.u. + 1/2 size 5RV.
$#* Bernard Curtis, Stalbridge: Tatung TMR-7602 + r.w. in loft.
$#* Martin Dale, Stockport: Codar CR-70A + a.t.u. + 23m wire.
* Ron Damp, Worthing: Racal RA17 + Hex loop or a.t.u. + Windom.
$#* James Duckworth, Barnet: Sony ICF-2001D + 10m wire.
$#* John Eaton, Woking: Lowe HF-225 + a.t.u. + 23m wire.
Jim Edwards, Wigan: JRC NRD-535 + 30m wire.
$#* David Edwardson, Wallsend: Trio R-600 + invert V trap dipole or loop.
$#* Peter Gordon-Smith, Kingston, Moray: Icom R-72 + a.t.u. + inverted V dipole.
$#* Arthur Grainger, Carstairs Junction: Lowe HF-225 or Pioneer F-502RDS tuner + loop.
$#* Michael Griffin, Ross-on-Wye: Lowe HF-225 + a.t.u. + 45m wire.
$#* Bill Griffith, W.London: JRC NRD-535 + 25m wire.
$ Alec Griffiths, Inverness: Steepletone or Vega or Philips AS440 + r.w. or dipole.
#* Gerry Haynes, Bushey Heath: Kenwood R-5000 + 40m wire + MLB or Kiwa loop.
$#* Francis Hearne, N.Bristol: Sharp WQT370 + r.w.
$ Simon Hockenhull, E.Bristol: Roberts R817.
$#* Sheila Hughes, Morden: Sony ICF-7600DS + loop or Panasonic DR48 + 15m wire.
$#* Rhoderick Illman, Oxted: Kenwood R-5000 + MLB + r.w.
$ Stephen Jones, Oswestry: Matsui Hi-fi.
* Tony King, Swindon: Philips D-2935.
$ Danny Leahy, Reading: Roberts 817 + Datong AD-270.
$#* Ross Lockley, Stirling: Realistic DX-300 + a.t.u. + 25m wire.
#* Paul Logan, Lisnaskea: Yaesu FRG-8800 + a.t.u. + 100m wire.
$ Laurence Mason, Hassocks: Grundig Yacht Boy 400 + 4m wire
$#* Eddie McKeown, Newry: Tatung TMR-7602.
$# Roy Merrall, Dunstable: Kenwood R-5000 + 40m wire.
$#* George Millmore, Wootton: Sangean ATS-803A or Racal RA17L + loop.
* Denis Mulkeen, Kiltimagh, Eire: Sangean ATS-803A + 10m wire.
$#* John O'Halloran, Harrogate: Yaesu FRG-100 + trap dipole + balun with Marconi T switch.
$#* Fred Pallant, Storrington: Trio R-2000 + a.t.u. + r.w.
* John Parry, Larnaca, Cyprus: Realistic DX-400 + r.w
$* Roy Patrick, Derby: Lowe HF-125 + 22m wire.
$# Peter Perkins, Hemel Hempstead: Kenwood R-5000 + 17m wire + NTR-1.
$#* Clair Pinder, Appleby: JRC NRD-525 + Yaesu FRT-7700 + 16m wire.
$#* Peter Pollard, Rugby: Sony ICF-2001D + AN-1 or r.w.
$#* Philip Rambaut, Macclesfield: Int.Marine Radio R.700M + r.w.
$# Richard Reynolds, Guildford: Sangean ATS-803A + a.t.u. + 10m 'T'.
$# Harry Richards, Barton-on-Humber: Grundig Satellit 700 + AD270 or r.w. or Grundig Yacht Boy or Matsui MR 4099.
Alan Roberts, Quebec, Canada: Lowe Europa + 49m dipole or 11m vertical dipole.
$#* Chris Shorten, Norwich: Matsui MR-4099 + 10m wire.
$* John Slater, Scalloway, Shetland: Lowe HF-150 + 20m wire.
$#* Tom Smyth, Co.Fermanagh: Sangean ATS-803A or Morphy Richards R191.
$# John Stevens, Largs: Hammarlund HQ 180 or Icom R-70 + loop or r.w.
$#* Andrew Stokes, Leicester: Lowe HF-150 + 15m wire.
$#* George Tebbitts, Penmaenmawr: Blaupunkt stereo radiogram (circa 1968).
$ Phil Townsend, London: LF converter + Lowe HF-225 + loop or a.t.u. + r.w.
* Bernard Tyers, Co.Waterford: Grundig Yacht Boy 400 + 7m wire
$* John Wells, E.Grinstead: RCA AR88D + Loop.
* T. Williams, Truro: Sharp 5454 radio/recorder or Gundig Yacht Boy 206.
$#* Julian Wood, Elgin: Kenwood R-2000 + Yaesu FRT-7700 a.t.u. + 5m wire.

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

Info In Orbit

Rain and more rain during February but at least the satellite pictures are looking better as the sun rises to higher elevations in the northern hemisphere. Scandinavian countries have had their seasonal cold weather, and pictures from METEOR 3-5 show huge ice flows covering the northern part of the Gulf of Bothnia. Several inland lakes were frozen over in northern Europe.

Current WXSATs

For many weeks there has been just one METEOR WXSAT (3-5) in operation, transmitting images in sunlight only, on 137.85MHz. Travelling north-bound, as it approached the poorly illuminated northern regions, the image of land below became darker. Transmissions always cut off before the satellite crosses into night, and this cut-off position can be anticipated by watching the aperture bars opening, as described in previous editions of this column. As the sun rises higher during the early months of the year, the gradual improvement in ground illumination means that METEOR 3-5 stays on that little bit longer each week.

The American WXSAT NOAA-10 surprised me (and probably the rest of the WXSAT fraternity) by remaining on throughout the period from January 20, when its passes coincided with those of NOAA-12, which also transmits on 137.50MHz. I have not seen any official reason given for this unusual event. Receiving transmissions from both satellites simultaneously, causes severe interference - deep nulls, and mis-synchronisation of the decoded picture. During such passes software tries to synchronise to the stronger signal, but cannot correctly interpret the combination of two signals on identical frequencies.

Because of the nature of high resolution data transmissions (where the signal is received from a dish operating in the 1700MHz band, being driven to follow the satellite), h.r.p.t should not be affected. This period of mutual interference lasts for just a few days, after which NOAA-10 passes a given location a few minutes before NOAA-12.

The quality of NOAA-10 infra-red video transmissions has remained rather poor. I decided to re-adjust my own fitted decoding card and optimise it for NOAA-10, but there was little improvement - the fault essentially being with the WXSAT.

NOAAs 9, 11 and 14

My first logging of routine a.p.t. (that is, one visible-light channel together with one infra-red channel) from the recently launched NOAA-14 happened on January 25. Before that, we saw the normal 'early-launch' operations policy of two 'visible-light' channels.

If each of these NOAAs remained transmitting a.p.t. on 137.62MHz there would be possibilities for combinations of v.h.f. transmission clash, as described previously for NOAA-10. NOAAs-9, 11 and 14 have orbital periods of 101.862, 101.908 and 102.02 minutes respectively. On January 29, and for a day or two either side, all three WXSATs were lined up together - see **Fig. 5** (if space permits). Having the shortest period, NOAA-9 advances more quickly than NOAA-11 so within a week or so, such alignments end.

Given the recent failure of NOAA-11's video system, it is reasonable to expect that there may be no further NOAA-11 a.p.t. transmissions. However, finding myself unexpectedly at home in mid-February(!) I checked out beacon transmissions and there it was - the 137.77MHz beacon at 1518UTC on February 14, so evidently at least some of the equipment on-board the satellite is operating!

Fig. 1: NOAA picture from Geoffrey Chance.

Fig. 2: METEOSAT C9D format from Robert Hall.

Preventative Maintenance

It is inevitable that the weather takes its toll on outside equipment. I have two external antennas (crossed dipoles); one on the roof - and essentially out of reach - and one at the top of the washing line (by kind permission!) It makes sense to check the state of metal fixings and cord at least once a year, so I lowered the nearby mast and checked and greased each clamp. So far there are no problems. Some of the protective covering on the cables needed renewing - we get the worst of the westerlies here - before they reach the rest of the UK.

Checking out the pre-amp fitted to the (ground level) dish showed that, quite to my surprise, it was still in good condition, so a little more silicon sealant around the join of the two sections was probably enough. I had expected to find some dampness inside. This is an instance in which the maxim 'if it ain't broke, don't fix it' is ignored!

Check out the feed on your METEOSAT dish. The little internal dipole (if you have the sensor type) seems to attract spiders and other insects. A web in these sensitive parts may have a high microwave absorption coefficient! Check whether winds have moved your dish to one side of its intended direction. Mine is not bolted to the ground, mainly due to planning restrictions, though I suspect that a permanent fixture would not be a problem. When I expect strong winds I lower the dish and lay it on the ground. Consequently, it has to be re-positioned each time it is re-installed. A number of METEOSAT systems use the patio style dish and these should be regularly checked for alignment.

Letters

As mentioned a month or two back, a couple of readers have pointed out apparent problems when running Birddog. For most of the time I have only noticed one problem - occasional negative orbit numbers for certain satellites. In late January I was updating the Kepler file in this program and realised that some of the resulting satellite tracks were wrong. A few days later **Geoffrey Chance** of Redruth wrote to me, having noticed the same effect. The same Keplers produced correct results from my other tracking programs. Using later Kepler elements the problem disappeared - at least on my machine!

Geoffrey also sent **Fig. 1**, a NOAA picture printed on an HP Deskjet. He imported the image from PCX format via Windows Paintbrush, into Pageplus 3 (a desk-top-publishing program), then printed the result. There can be significant differences in the quality of printouts, depending on the nature of the software used to generate the image, as well as the printer quality. Some years ago I did a WXSAT image printout on an Epson 9-pin printer, first using one package, then using WordPerfect. The difference was astonishing.

Fig. 3: Peter Hayes' h.r.p.t equipment.

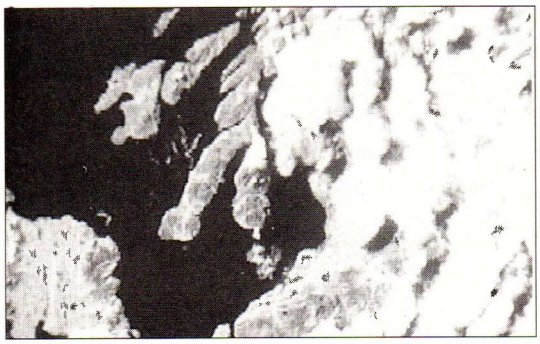


Fig. 4: HRPT region of Mull of Kintyre from Peter Hayes.

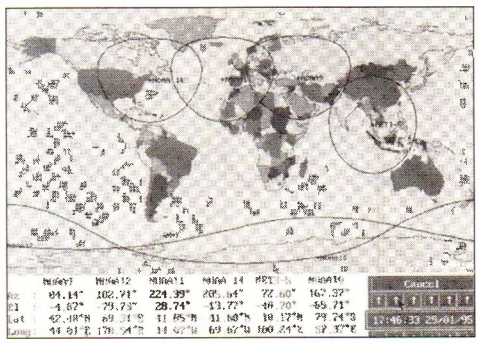


Fig. 5: Overlapping footprints of NOAAs 9, 11 and 14.

WordPerfect produced a very good quality image, despite the limitations of 9-pin printing.

Robert Hall of Capetown in South Africa sent me two METEOSAT-5 pictures, one of which - the C9D format - is shown in **Fig. 2**. There are many different formats (sections of the visible hemisphere) transmitted from METEOSAT and each area has its own special features. The C9D format shows the lower right portion of our hemisphere - south-east Africa - and Robert produced this picture showing typhoon Foda, seen to the east of Madagasca. He uses PROsatII and an HP-520 printer.

NOAA High Resolution Systems

Last year I included some notes on high resolution systems being developed by commercial organisations and some individuals. **Peter Schoen** of Helmbrechts, Germany is one of a number of readers who have asked for further articles on this specialist topic. He has set up a Timestep h.r.p.t. system and wants to gain more experience in this area.

Peter Hayes of Ayr in Scotland has accomplished what many of us (including me!) dream about. He has built a METEOSAT Primary Data Station and NOAA High Resolution Picture Telemetry (h.r.p.t.) system. Some months ago I briefly described some of Peter's set-up. The electronics in h.r.p.t. receive mode (Peter uses the equipment for METEOSAT Primary Data and h.r.p.t) can be seen in **Fig. 3**, and the screen shows an h.r.p.t. image being received. The same image is shown in **Fig. 4**, which Peter says shows his own location.

He explains that he modified the design published in an original article by Christieson in *Wireless World* and found the system to work satisfactorily. He uses an Icom R-7000 receiver and a v.h.f. to 10.7MHz converter. The photograph of Peter's equipment shows a box positioned on the receiver - this is the h.r.p.t. satellite simulator - built according to the original article.

The dish used for h.r.p.t. is a 0.9m dish fitted to a Yaesu rotator sitting on a Versatower, about 10m high. With Peter's location overlooking the Firth of Clyde to the north, he has a clear view to within a couple of degrees of the horizon from west through to south-east. His southern horizon is limited by a hill, but Peter adds that looking northwards he can see Novaya Zemla, Spitsbergen, Baffin Island and Newfoundland, and beyond the top of Greenland.

Good pre-amps are an essential component of all high resolution systems and, wanting to monitor all the 'horizon-scraping' passes, Peter has done some interesting experiments. He initially used the Timestep pre-amp alone, then fitted a second pre-amp - one to each feed - at the feedhorn, and fed the outputs to the combiner. This worked very well and Peter found himself able to receive h.r.p.t. for any pass that could be monitored on a.p.t. - but without any fading or interference.

On one occasion he found that no signal was being received. Investigation led to the discovery that the down-converter - positioned at the top of the mast - was full of water! A soak in hot, soapy water and gunge extraction with a paintbrush, followed by thorough drying, restored its operation, apparently with no ill effects. Peter now adopts a policy of feeding all signals back to base at microwave frequencies before further signal processing is done. This allows the down-converter to be kept indoors.

Using just one pre-amp, Peter first tried the horizontal polarisation feed but found this rather poor, producing deep nulls in the signal when the satellite was 'side-on', so he switched to vertical polarisation and is very pleased with the results.

Peter makes some valuable comments regarding cable and connectors. He uses cheap coax and (I believe) F-type connectors - these are easy to fit. He asks "ever tried putting an N-type on H100?" Actually - yes! It is extremely difficult, not least because N-type plugs come in several sizes having various internal components. The unsuspecting purchaser may buy one or two, only to discover there may be no instructions included within the package. Contrastingly, the connectors used for satellite television are simple to fit.

His conclusions show that using a carefully constructed pre-amp with a 0.9m or 1.0m dish, using vertical polarisation gives 16 to 18dB S/N ratio, and higher on good passes. With his Timestep system decoding the data with about 12 to 14dB S/N, there is a little in hand for tracking errors. My grateful thanks to Peter for providing information about his development of high resolution receiving equipment.

ESA Journal

The European Space Agency has ceased publication of its Journal, as part of cost-cutting measures. A letter from **J M Luton** points out that a number of commercial journals are now published to cover this field. The other ESA publications will continue.

New Products

It is a long time since I have used a METEOSAT down-converter, so I was pleased to arrange delivery of a unit, together with Yagi and decoding card - all expected to be reviewed shortly.

BBS (Bulletin Boards)

For those with a computer and modem, there are a number of UK BBS available, where items of interest to the space enthusiast are accessible. I regularly access most of the following BBS, except for Prometheus which I have not been able to contact. Elsewhere, modem protocol is the standard 8 bit, no parity, 1 stop bit. In alphabetical order:

Dartcom provide a variety of files including Kepler elements, updated once per month. They are on (01822) 88249.

The Prometheus BBS includes radio astronomy, rockets and Kepler elements - courtesy AMSAT-UK. To use the system you need a terminal/micro running the Viewdata emulation. The number is 0181-300 7177.

The Remote Imaging Group (RIG) BBS carries Kepler elements updated weekly, with a good selection of programs and files available for members to download. It is on (01945) 440666. I would recommend using Baud rates up to a maximum of 9600 for this BBS due to persistent problems with the telephone line.

Starbase1 is a BBS devoted to astronomy and space matters. Kepler element files are available, as are thousands of space-related files, images and NASA publications. Two lines are available: 0171-703 3533 and 0171-701 6914.

Timestep Weather Systems BBS normally contains the latest Kepler elements for the WXSATs. It is on (01440) 820002.

WXSAT Clubs

Monitoring WXSATs is an international hobby and groups have been started in several countries. The main British club is the Remote Imaging Group whose membership secretary is Ray Godden G4GCE at Wayfield Cottage, The Clump, Chorleywood, Herts WD3 4BG. Membership is £10 per year, which includes four editions of the quarterly journal, a very well produced publication.

Kepler Elements

David Banks G7SIQ of Egremont asked whether it is feasible to publish some Kepler elements in the column. At one time this was done in *SWM*, but in my view the editorial staff were right to drop the idea. The problem is in the period that elapses before publication. In an average case, data will be a minimum of four weeks old, and could be older. The Keplers that I issue to readers will normally be just a few days old and should remain usable for at least a month.

Different options for receiving data are available. A significant number of requests come from abroad so I have included a special mention for this group.

1 For a print-out of the latest WXSAT elements, send a stamped, self-addressed envelope (s.a.e.) and separate, extra stamp. All WXSATs plus MIR are included, together with transmission frequencies if operating. This data originates from NASA. Foreign correspondents should provide one international reply coupon per envelope, and can ignore the extra stamp (which is difficult to obtain abroad).
2 I now send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (plus four s.a.e.s for four editions. Foreign correspondents can forgo the £1!
3 You can have a computer disk file containing recent elements for the WXSATs and other groups of interest, together with a large ASCII file holding elements for many satellites. A print-out is included, identifying NASA catalogue numbers in both launch and object format - ideal for computer data retrieval. Please enclose cash, a cheque, or PO for £2 (sterling please!) with your PC-formatted disk and s.a.e.

Finally

Readers may be disappointed to read that I have once more joined the ranks of the unemployed.

Frequencies

NOAAs 9, 14 a.p.t. on 137.62MHz; NOAAs 10, 12 on 137.50MHz; NOAA beacons on 136.77 or 137.77MHz; METEORs use 137.30, 137.40 and 137.85MHz and OKEAN-4 may use 137.40MHz occasionally.

Mike Richards G4WNC, PO Box 1863, Ringwood, Hants BH24 3XD. Compuserve: 100411,3444: Internet: mike.richards@bbcnc.org.uk

Decode

All the Data Modes

C. Anderson of South Africa has written thanking me for supplying copies of Hamcomm and JVFAX on February 12. What's so clever about that I hear you ask - well, I posted the programs air mail on December 14! The moral is, if you're ordering from abroad (especially South Africa) be prepared for extended delays.

M. Hoddinott of Chester has been using an old electro-mechanical teleprinter for his utility reception. However, the recent change of speed to 75 baud by many stations means that his 50 baud unit is of little use. He asks if I can help with conversion details between his existing terminal unit and a more modern dot matrix based teleprinter. Unfortunately, he hasn't given enough information for me to give a satisfactory answer. The best place to try may well be the British Amateur Radio Teledata Group (BARTG). This group has been dealing with amateur RTTY and associated technologies for many years and has a wealth of experience within its membership. The group is open to all and the subscription rates are £10.00 UK, £14.00 Europe & Eire, £14.00 Overseas (surface mail), Overseas (air mail) £22.00. Included within the membership fee is a comprehensive quarterly magazine called *Datacom*. If you're interested in joining, you need to send your membership fee to Peter Adams G6LZB, 464 Whippendell Road, Watford, Hertfordshire WD1 7PT. Tel: (01923) 220774.

David Banks of Egremont has written with a thank you note for my FactPack 4 (JVFAX and HAMCOM Primer). David reports that he found the instructions very logical and pitched at just the right level. I'm glad to see that my efforts are proving useful, but if you have any comments on the FactPacks (good or bad) please let me know so I can update them.

Simon Pitt of Hanworth asks if I can help with software for his Atari ST computer. Simon has an Atari 1040STE with 40Mb hard disk and would like to use it to decode c.w. and RTTY. He would also like to use his computer to help him learn Morse code. I'm afraid I don't know of many software sources for this computer, but Grosvenor Software regularly advertise Atari products through the magazine. The contact details are: Grosvener Software (G4BMK), 2 Beacon Close, Seaford, East Sussex BN25 2JZ. Tel: (01323) 893378.

Alistair McIntyre of Glasgow is new to JVFAX and asks if there's an optimum setting for the APT modes. He also wonders if he needs to adjust the settings to receive different stations. The simple answer is - don't alter the original configuration. The default settings for the start and stop tones and timings align with the standards used by virtually all FAX stations. The whole point of APT transmission is that the receiver will use the data contained in the transmitted signal to ensure the correct receive mode is selected. The only exception to this is the selection of the correct shift. Whilst all h.f. FAX stations use a ±400Hz shift, on l.f. this changes to ±150Hz.

Dr Martin van Duinen of The Netherlands is equipped with a very comprehensive monitoring station based around the Hoka Code 30 decoder and Icom R-9000 receiver. Not surprisingly, his main interest centres around the analysis and decoding of the more complex signals on the h.f. bands. Much of his time is spent tracking down these stations looking for new modes and variants of existing systems. As part of this he uses the Hokas sophisticated analysis systems to put together the pieces of the jig-saw. A good example of this is a CIS Piccolo 1 x 10 + 2 x 11 multi-tone system running at 40 baud. If you want to take a listen to this station it can be found on 12.209MHz at around 1400UTC.

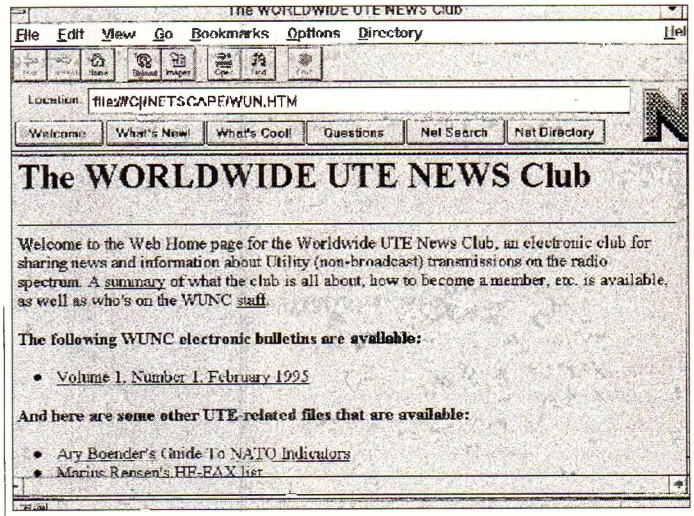
Halifax Changes

The popular military FAX and RTTY station CFH Halifax has recently dropped its 6.4965MHz frequency in preference for the new 6.330MHz channel. The new 24 hr frequency line-up therefore becomes: 122.5kHz, 4.271, 6.330, 10.536 and 13.510MHz.

If you want to QSL with this station, the address remains the same at: Canadia Forces Meteorology and Oceanography Centre, Master Warrant Officer, Maritime Forces, Atlantic Headquaters, FMO Halifax, CFB, HALIFAX, NS B3K 2XO, Canada.

MAP Schedules

Agence Maghreb Arabe Presse (MAP Rabat) is a popular source of Middle Eastern press reports that puts a good signal into Europe. The following schedule should help you find the best frequency and transmission time.



Arabic (0900-1030 & 1530-1700UTC)
To Middle East & Africa
CNM80/x11 (18.4961MHz)

French
To Southern Africa CNM78 (18.265MHz) 0800-1130 & 1530-1700UTC
To Western Africa CNM76/X9 (18.2209MHz) 0800-1130 & 1530-1700UTC
To Eastern Europe CNM65/1X (15.6549MHz) 0800-1130 & 1530-1700UTC
To Western Europe CNM20/1X (7.8424MHz) & CNM61 (14.760MHz) 0800-1130UTC
To Western Europe CNM20/1X (7.8424MHz) & CNM37/9X (10.6341MHz) 1530-1700UTC
To Eastern Europe & Asia CNM85/X11 (19.1711MHz) 0800-1130 & 1530-1700UTC

English
To Middle East CNM80/X11 (18.4961MHz) 1200-1400UTC
To Southern Africa CNM78 (18.265MHz) 1200-1400
To Western Africa CNM76/X9 (18.2209MHz) 1200-1400UTC
To Eastern Europe CNM65/1X (15.6549MHz) 1200-1400UTC
To Western Europe CNM20/1X (7.8424MHz) 1200-1400UTC
To Eastern Europe & Asia CNM85/X11 (19.1711MHz)

If you come across any schedules for other stations please drop me a line. The QSL address for MAP is: Maghreb Arabe Presse, Le Chief d'Exploitation, Rue Ibn Aicha, BP1049 RP, RABAT, Algeria.

World-wide Utility News Club

The beginning of February saw the launch of a brand new news service for h.f. utility listeners (s.s.b. and data). The World-wide Utility News Club is an electronic club dealing exclusively with utility signals on the h.f. bands. The club resides on the Internet and is freely available to anyone who cares to subscribe. In this context, subscribing is simply registering your interest with the host site (details later).

One of the main benefits of the club is the bringing together of like minded people from all over the world. The club operates in three basic modes, newsletter, mailing list and Internet Relay Chat (IRC). The newsletter provides a regular summary of the latest news and information from a number of specialist contributors. I'm not sure about the periodicity of the newsletter, but I suspect it will be monthly. In its electronic form, volume 1 was delivered by e-Mail in five parts.

In addition to news from the specialist areas, a large proportion of the magazine was devoted to extensive frequency loggings. Although the magazine was very useful, the real benefits of an on-line electronic club come from the rapid dissemination of information through e-Mail and IRC. The mailing list system works through what's known as a list server. This is rather like an automatic mailbox that takes all incoming mail and copies it to all those that subscribe to the mailing list. In practice what happens is people send in both questions and information which is then broadcast to all the club members.

One of the great assets of this system is speed of distribution as these messages are relayed out to club members within minutes or hours rather than days. The down side is that even in the early days of the club it's generating a lot of mail. In my particular case, I find I'm receiving around 30 postings per day just from the Utilities Club. Whilst there are some real gems of information, you do have to plough through a lot of other information first.

In order to keep the mail system flowing freely there are a few guidelines that need to be followed. The first is to make sure you send any personal messages or replies direct to the originator rather than using the mailing list. Also don't send weighty encoded files through the system as it slows traffic considerably and some of the

mailservers may not be able to handle the encoding system.

The alternative to the full mail system is to register with the newsletter only listserver. By doing this you will just receive the newsletter without being inundated with all the e-Mail messages.

The final and possibly most inspirational feature is the use of Internet Relay Chat for utility work. The IRC facility is supplied by client software on your computer linking through the Internet to a host machine. Once set-up, you can link with other utility listeners and chat (via the keyboard) together in real time. The system works best when a number of like minded listeners meet together at a pre-arranged time. Although the World Utilities Club have only just started doing this, there is great potential to link people from around the world to help identify some of the mystery stations out there. In the UK the main snag with this system is 'phone charges as you have to stay on-line to take part. However, this is not too much of a problem if your Internet service provider has a Point of Prescence (PoP) in your local call area.

If I've whetted your appetite, here are the details to get logged on to the World Utility News Club. For the newsletter only, send e-Mail to majordomo@phoque.info.uqam.ca and in the BODY of the message type: subscribe wunnews. To receive all the mail-list offerings plus the newsletter send e-Mail to majordomo@phoque.info.uqam.ca and in the BODY of the text type: subscribe wun. To unsubscribe from the mail-list send to the same address but include the text unsubscribe wun <your e-Mail address>. Finally, for those with a preference for using the World Wide Web (WWW) interface to the Internet the World Utility News Club have their own WWW page located at http://sun-gabriel.aero.org:8800. This is a fascinating page with links to all manner of interesting places such as the ITU, Janes ships and lots more.

Incidentally, if you're looking for a good DOS based logging program SWLOGit seems to be highly thought of by the WUN members. If you have Internet FTP facilities it can be found at ftp.virginia.edu in directory /pub/swlogit/.

If you don't have Internet access, but would still like to see the newsletter, they are intending to make paper copies available. As soon as they release the pricing details I'll let you know through the column.

Super List

The latest addition to the wealth of utility information produced by Joerg Klingenfuss is his *1995 Super Frequency List*. The list is suppled on CD-ROM for use on IBM compatible computers running Windows. The list comprises some 14000 frequencies from his *Guide to Utility Radio Stations* plus 1000 abbreviations and 12000 formerly active frequencies. The frequencies were updated in January '95 so this is about as up-to-date as you're likely to get!

The CD -ROM comes with its own viewing software and runs entirely from the CD-ROM. This means you don't lose any valuable hard disk space. One of the penalities of CD-ROM based applications can be slow response times, but this is not the case here. The typical response time from starting a search to retrieving the information was around one second which is good for any system with 14000 records and shows some careful planning has been put into the retrieval system. The search facilities provided were quite comprehensive and included searchs by frequency, station, callsign or country. You could either use the mouse to search or, perhaps more conveniently, you could use the arrow and page-up and page down keys. The edit menu included an option to copy the currently selected record to the Windows clipboard. You could use this facility as a means of transfering information to other applications. My only complaint was the lack of a browse facility like that found in dBase IV where you can scroll through frequencies with around 15-20 displayed at any one time. This would be particularly useful when trying to identify new stations.

Having whetted my appetite with this first offering I was eager to see the retrieval software uprated to allow the frequency and mode data to be communicated direct to the receiver. It ought to be relatively simple to produce a selection of basic drivers to allow for this on most of the popular communications receivers (PS: make sure the HF-150 is included). It would also be great if you could automatically transfer the data for logged stations to a local personal database. Still enough of my ramblings - I'm sure Joerg will take my comments in good heart and update the database where practical. However, any programmers out there might like to to start work on their own retrieval software to provide these and other features (maybe these could take data from the Windows clipboard). If you would like a copy of *The 1995 Super Frequency List* you will need to order direct from Joerg Klingenfuss at: Klingenfuss Publications, Hagenloher Str. 14, D-72070 Tuebingen, Germany. Phone + +49 7071 62830 or FAX + +49 7071 600849. The current price is DM 50 plus DM 5 for overseas airmail. My thanks to Joerg Klingenfuss for supplying the review copy.

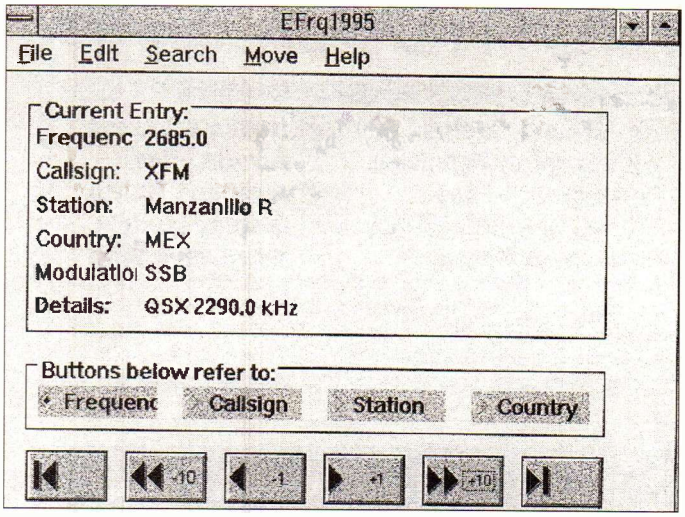
Decode Special Offers

Here's a summary of the readers offers currently available.

IBM PC Software: JVFAX 7, HAMCOMM 3

Literature: Day Watson Beginners List, Decode List, Complex Modes List, FactPack - 1 Interference, FactPack 2 - Decoding Accessories, FactPack 3 - Starting-Out, FactPack 4 - HAMCOMM/JVFAX Primer, FactPack 6 - Internet Starter.

To receive any of these offers just send a self addressed sticky label plus 50p per item or £1.50 for 4, £2.50 for 6 or £3.00 for 8 items, £4.00 for 9 or 10 items. If you're ordering JVFAX or HAMCOMM you will also need to send a blank formatted 720Kb disk for each program or just one 1.4Mb disk. Other software and information of interest to transmitting amateurs is available, send for details.



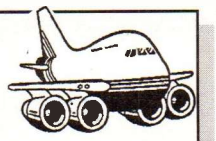
Frequency List

Now for this month's frequency listing which come thanks to contributions from **Guy Denman**, **Day Watson**, **Ian Taylor** & **David Holman**.

If you would like to supply logs for the column just post or e-Mail them to the address at the head of the column. Remember they don't have to be exotic logs - I need to know the regulars are still in operation as well.

Freq (KHz)	Mode	Speed	Shift	Call	Time	Notes
518	NAVTEX	100	170	SVK	1740	Kerkyra Radio Greece
3389	RTTY	75	850	MGJ	1802	Glasgow naval
4055	FAX	90	576	-	-	Murmansk Met
4220.9	RTTY	75	200	GYU	-	RN Gilbralta
4253	SITOR-A	100	170	UCE	-	Arkhangelsk radio
4279	RTTY	75	400	PBC	1426	Holland naval
4583	RTTY	50	400	DDK2	1751	Hamburg Met
4813	RTTY	50	400	LZA	1753	Sofia Bulgaria
5100	FAX	120	576	AXM32	1930	Melbourne Met
5478	ARTRAC	125	170	-	-	MFA Budapest
5755	FAX	120	576	AX132	1910	Darwin Met
6972	RTTY	50	400	YOG59	1809	ROMPRES Bucharest Romania
7345.7	COQ-8	-	-	-	-	MFA Algiers
7650	RTTY	75	350	BZP57	1845	Xinhua Beijing
7926	FEC100	96	400	DFG91	1733	PIAB Bonn Germany
8028	FEC-ROU	164.5	400	V5G	-	MFA Bucharest
8123	ARQ-M2	96	400	TNL	1822	Brazzaville Congo Ascena
9076.7	ARQ-E3	192	400	RFFA	-	/FF Paris
9196	ARQ-342	96	170	TNL	-	Brazzaville air
10863	FAX	120	576	NAM	2230	USN Norfolk
11415.5	TWINPLEX	100	-	-	-	MFA Madrid?
12750	FAX	120	576	NIK	2148	USCG Boston
12808	CW	-	-	VTG7	1615	Bombay
13366	RTTY	50	170	5YD	1419	Nairobi air
13374	RTTY	50	170	5YD	1745	Nairobi
13399	RTTY	75	400	DFZG	1525	TANJUG Belgrade
13440	RTTY	50	400	YZJ5	1527	TANJUG Belgrade
13527	COQ8	166	-	-	1529	Unid
13570.0	FEC-A	96	400	DGN57L1	-	PIAB Bonn
14367	RTTY	50	400	BZP54	1215	Xinhua Bejing
14448	VFT	-	-	MKK	1600	RAF London
14764	SITOR-A	100	170	-	2115	USN MARS
14989	SITOR-A	100	170	-	1110	Egyptian embasy
16206	FECS	143	850	TAD83	1415	Ankara Turkey MFA
16268	FAX	60	576	9YF207	1555	Kyodo press Singapore
18351	CW	-	-	KWS78	1235	US embassy Athens
18390	RTTY	50	330	5AF	1315	Tripoli air
18724	SITOR-A	100	170	-	1330	MFA Cairo
18762	FEC-ROU	164.5	400	V5G	-	MFA Bucharest

FLIGHTDECK



MANCHESTER'S PREMIER AVIATION

- ☑ Airband Radios
- ☑ Scanning Receivers
- ☑ Helpful Advice
- ☑ A/C Spotting Software
- ☑ Maps & Charts
- ☑ Books & Videos
- ☑ Accessories
- ☑ Airliner T Shirts
- ☑ Display Models
- ☑ Shortwave Sets

Catalogue £1 from Dept. SW, 192 Wilmslow Rd, Heald Green
Cheadle, Ches. SK8 3BH. Tel: 0161-499 9350 Fax: 0161-499 9349
Open: 9.30am – 5.30pm Mon to Sat. Closed Wednesdays

SCANNER EXCHANGE
FROM THE REALISTIC SPECIALISTS

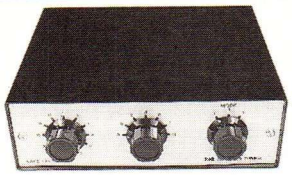
- Trade in your old scanner for the latest model
- Realistic, Yupiteru, AOR, Bearcat
- Phone for best deal
- New and secondhand scanners always available
- 3 months warranty on secondhand scanners
- Retail, export and trade sales

G6YTI **Link Electronics** G0CVZ

216 Lincoln Road, Millfield, Peterborough PE1 2NE
Tel (01733) 345731 Fax (01733) 346770

Access VISA

NEW! TU3 Antenna Tuner



- ★ Ideal for receivers with a long wire Antenna on the H.F. bands, 1-30MHz.
- ★ Versatile! The touch of a switch gives any one of 3 different arrangements.
- ★ Quality case - black with printed aluminium front & back facias. Measuring only 170-140-50mm.

★ Kit complete with ALL components and hardware including pre-punched case and panels.

Price £44 Plus £4.00 P & P
Ready made £54 Plus £4.00 P & P

Send SAE for details of our full range of kits or call ***0115 938 2509***

LAKE ELECTRONICS

7 MIDDLETON CLOSE, NUTHALL, NOTTINGHAM NG16 1BX
(Callers by appointment only)

Access VISA

THE VINTAGE WIRELESS BOOK LISTING

Published regularly. Containing 100s of out of print, old and collectable wireless and amateur radio books, magazines etc. Send six first class stamps for catalogue or £3.75 for next four issues.

ESSENTIAL NEW BOOKS

BARGAIN OFFERS. THE LAST 50 COPIES OF JANES. NOW REDUCED.
Janes Military Communications 1990-91
A vast volume of 886 pages. Large format wraps. Contains descriptions, photographs and basic details of the worlds military communications equipment, some of which has been in service for up to ten years previously. Brand new. Published at £80 **Special price £35** p&p £5 (overseas postage extra).

Also reduced: The Teleprinter Handbook by A. G. Hobbs.
Covers in detail the theory and practice of teleprinter equipment, both European and American. Includes full descriptions and maintenance data for most machines and ancillary equipment. Over 300 pages with photos and circuits. Now **£5.50** p+p £2.50.

Eddystone Communications Receiver Data 1950-1970
A facsimile reprint of the circuit diagrams, general description and some service notes for sets from 1955-1970. 50 pages. **£9.50** incl post.

Communications Receiver Type CR100.
Complete handbook. 56 pages, full circuits layout and alignment notes. Large format. **£7.95** including p+p.

Wanted for Cash
Valve communication receivers, working or not. Items of govt. Surplus wireless equipment. Pre 1975 wireless and TV books and magazines.

(Dept SW) CHEVET SUPPLIES LTD.
157 Dickson Road, BLACKPOOL FY1 2EU
Tel: (01253) 751858. Fax: (01253) 302979. Telephone orders accepted.

Access VISA

26 Clarendon Court • Winwick Quay
Warrington • WA2-8QP
Tel (01925) 573118

For years the Microreader has been one of the most successful and widely used decoders in Britain and has opened up the world of utility decoding for thousands of listeners and hams. With the Microreader you don't need computers, monitors or any special equipment simply plug into your speaker socket and turn on. What could be simpler? But don't be fooled by it's small size and low price, the Microreader is powerful and can match the performance of other big box units. The built in tutor has helped hundreds to learn to read and send CW perfectly. The latest version 4.2 firmware is the result of listening to what people want and expect from a decoder and combines ease of use with the highest ever level of performance.

MKII (V4.2) MICROREADER £199.50

When you buy a Microreader not only do you get a full two years guarantee you get access to help assistance from a company committed to 100 percent customer satisfaction. The Microreader comes complete with leads, easy to read instructions, frequency list and you want to display the decoded messages on a computer screen.
Please call or write for more information as space limits a full description.

SYNOPTIC DECODER

This is the easy way to translate the five figure code groups from the many meteo weather stations around the world into plain and readable English. No more books and tables, reports from aircraft, ships and land station are translated instantly and in full detail. How thick is the fog on the Tyne? What is the cloud type in New York? Transmissions from Bracknell are intended for the M.O.D. but you can decode them together with similar data from around the world. Works in conjunction with the Microreader or with any other decoder equipped with a serial RS232 output. Decoded messages can be displayed on home PC, dumb terminal or printed using a serial printer. Write or ring today for more information together with example print-outs.

£99.50

MkII Microreader £199.50
Synoptic Decoder £99.50
Computer Terminal Program £10.00
Upgrade old MkII Microreader £20.00

ALL PRODUCTS GUARANTEED FOR 2 YEARS & PRICE INCLUDES VAT & DELIVERY
UPGRADES £20.00 I TERMINAL PROG £10.00 I

SERVICE MANUALS

We have what is probably the largest range of Service Information available anywhere. From the Earliest Valve Wireless to the Latest Video Recorders, Colour Televisions, Test Gear, Audio, Computers, Amateur Radio in fact practically anything. Write, Fax or Phone for immediate Quote. Originals or Photostats as available.

Also available. Our FREE catalogue detailing Hundreds of Technical Books and Repair Guides available.

STOP PRESS Now Available. Our Service Manuals Index on P.C. Disc (3.5") for use on your Computer. Just £3.50 with FREE everlasting Updates. Order MP-285.

MAURITRON TECHNICAL SERVICES

8 Cherry Tree Road, Chinnor, Oxford OX9 4QY
Tel:- (01844) 351694 Fax:- (01844) 352554

Please forward your latest catalogue for which I enclose 2 x 1st Class Stamps or £3.50 for the Technical Books Catalogue plus Manuals Index on PC Disc(s).

NAME _____

ADDRESS _____

_____

_____

_____ POSTCODE _____

Photocopy this coupon if you do not wish to cut the magazine

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

LM&S

Long, Medium and Short Waves

The continuing decline in solar activity, as the sunspot minimum approaches, has led to poor propagation conditions in the higher frequency bands. In an attempt to provide a reliable service, some s.w. broadcasters are making more use of the lower frequency bands. To some extent this is counter-productive as the resulting congestion causes high levels of co-channel interference.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless stated, all logs compiled in the four weeks ending January 29.

By searching the band during daylight and again after dark **Fred Pallant** (Storrington) was able to establish that the broadcasts from Bechar, Algeria on 153kHz; Medi-1, Nardor 171; Azilal, Morocco 207; Oslo, Norway 216; Tipaza, Algeria 252 could only be received via sky wave paths after dark. Around 2000UTC he observed that the 2000kW transmission from Allouis, France on 162 was suffering from slight co-channel interference. By careful listening he was able to detect Turkish style music on the interfering carrier, which implied that it was coming from the TRT 1000kW outlet at Agri.

The sky waves from the Radiotelevisione Italiana (RAI) 10kW outlet at Caltanissetta, Italy on 189 were received by **John Eaton** in Woking on January 9. He logged them as SINPO 33433 at 2250.

Medium Wave Reports

January conditions at night were often suitable for m.w. transatlantic DXing. The broadcasts from CJYQ in St.John's on 930 were frequently heard by **Roy Patrick** in Derby - a typical rating being 24422 at 2315. He also logged WEVD New York on 1050 at midnight and WBAL Baltimore 1090 as 24432 at 0030.

CJYQ was heard for the first time ever by **Paul Bowery** (Burnham-on-Crouch) on the 10th. Their signal was 14311 at 0200. Encouraged by this he listened again on the 11th and was surprised to hear CFBC in St.John on 930, which was peaking 13422. No other signals were heard.

Another station in St.John's, VOCM on 590, was heard at the exceptionally early time of 2115 by **David Edwardson** in Wallsend. Their signal rated 24442. Later, he logged WTOP Washington DC 1500 as 25542 at 0030; CJYQ as 24542 at 0035; WSSH Boston 1510 as 34543 at 0040; WEQW New York 1560 as 24432 at 0045; WWKB Buffalo 1520 as 24432 at 0055; also CFRB Toronto 1010 as 24542 at 0100. At 0735 he noted WEVD as 25532!

The broadcasts from R.Globo in Rio, Brazil on 1130 were heard by **Robert Connolly** (Kilkeel) on the 15th - they peaked 32222 at 0245. That night he also logged CHAM Hamilton on 820 as 22332 at 0240; WTOP as 3222 at 0255; also CJYQ as 22222 at 0355.

Particularly good conditions were evident on the 17th, so **Paul Logan** (Lisnaskea) decided to search the band throughout the night! He logged New York's WFAN 660, WABC 770, WCBS 880, WINS 1010, WEVD, WBBR 1130 and WQEW 1560. Also Boston's WEEI 850, WBZ 1030 and WSSH. From other areas he heard WTOP, WWKB and WPTR Albany 1540. Quite a few stations in Newfoundland were audible: CHVO Carbonear 560, VOCM, CBNA St.Anthony 600, CKCM Grand Falls 620, CBN St.John's 640, CKGA Gander 650, CKXG Grand Falls 680, CKVO Clarenville 710, CHCM Marystown 740, CBGY Bonavista 750, CJYQ, CBG Gander 1400. Those in Nova Scotia were CJFX Antigonish 580, CFDR Dartmouth 780, CJCH Halifax 920, CHER Sydney 950, CHNS Halifax 960, CBI Sydney 1140, CIGO Pt.Hawkesbury 1410. Also heard were CFNB Fredericton NB 550, CHSJ St.John NB 700, CFBC, CBM Montreal 940, RFO St.Pierre & Miquelon 1375, CFDA Victoriaville 1380, CHRD Drummondville 1480.

Several C/S.American stations were also heard by Paul. On the 17th he logged R.Vibracion, Venezuela 1470 at 0118; TWR Bonaire, Ned Antilles 800 at 0120; R.Paradise, St.Kitts 830 at 0328; RCN Bogota, Colombia 770 at 0345; RCN Tunja, Colombia 1380 at 0345; R.Carupano, Venezuela 1110 at 0350; also R.Caracas, Venezuela 750 at 0400. On the 18th, R.Puerto Cabello, Venezuela 1290 at 2331; R.Caribbean Int, St.Lucia 840 at 0451; JBC-1 Port Maria, Jamaica 750 at 0500. On the 19th, Harbour Light, Grenada 1400 at 0010; Caribbean Christian R, Turks & Caicos 1020 at 0126; R.Guadalupana, Venezuela 820 at 0139.

Some listeners were less fortunate. One night in the third week of January **Eddie McKeown** heard a Canadian station on 930, which he suspected was CJYQ. It was peaking 23112 at 0102, but no ident could be obtained. The same problem was encountered by **Ron Damp** (E.Worthing) at 2132 on the 30th.

Broadcasts from stations in the Middle East, N.Africa and Europe also reached the UK after dark. Very good reception of the 1000kW transmission from Qurayyat, Saudi Arabia on 900 was noted on the 16th by **George Millmore** in Wootton, IoW. He logged it as SIO434 at 2140. Potent signals also reached him that evening from Batra, Egypt on 819 - they were SIO444. Sky waves from some other stations in N.Africa were received in the UK - see chart.

The BBC have relinquished 1053 and 1089kHz to make way for a new nation-wide commercial service called 'Talk Radio UK'. Additional transmitters are in operation in Newcastle-upon-Tyne on 1071 and in Torbay, Liverpool and Farnham on 1107. **Andrew Stokes** (Leicester) has found that 1053 provides the best reception in his area - 1089 suffers from considerable phase distortion all day.

Arthur Grainger (Carstairs Junction) has informed me that ILR NorthSound R and ILR R.Tay are now offering different services via their m.w. and v.h.f. outlets. NorthSound 2 and Tay AM are the names they have adopted for their m.w. services.

Long Wave Chart

Freq kHz	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	B*,H*,I*
153	Donebach	Germany	500	B*,C,E,F,G,H,J*
153	Brasov	Romania	1200	C*,H
162	Allouis	Fance	2000	A,B*,C,E*,F,G,H,I,J
162	Agri	Turkey	1000	H*
171	Nador Medi-1	Morocco	2000	B*,C*,G*,H*
171	Kaliningrad	Russia	1000	B*,C,E*,F,G,H,I,J
177	Oranienburg	Germany	750	B*,G,H,I*,J*
183	Saarlouis	Germany	2000	B*,C,E*,F,G,H,J*
189	Caltanissetta	Italy	10	D*
198	Droitwich BBC	UK	500	A*,B*,C,E*,F,G,I,J
207	Munich	Germany	500	B*,C,F*,G,H,J*
207	Azilal	Morocco	800	H*
216	Roumoules RMC	S.France	1400	B*,C,E,F,G,H,J*
216	Oslo	Norway	200	H*
225	Raszyn Resv	Poland	?	A*,B*,C*,E*,F*,G,H,I,J*
234	Beidweiler	Luxembourg	2000	B*,C,E,F,G,H,J
243	Kalundborg	Denmark	300	B,C,E*,F*,G,H,I*,J
252	Tipaza	Algeria	1500	C*,E*,G*,H*,J*
252	Atlantic 252	S.Ireland	500	B*,C,E*,F,G,H,I,J
261	Burg (R.Ropa)	Germany	200	G*,J*
261	Taldom Moscow	Russia	2000	B*,F*,H
270	Topolna	Czech Rep	1500	B*,C,E,F*,H,I,J*
279	Minsk	Belarus	500	B*,C*,D*,E*,G*,H,J*

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

Listeners:

A	Steve Brown, Newcastle-upon-Tyne.	F	Eddie McKeown, Newry.
B	Geoff Crowley, Aberdeen.	G	George Millmore, Wootton, IoW.
C	Martin Dale, Stockport.	H	Fred Pallant, Storrington.
D	John Eaton, Woking.	I	Tom Smyth, Co.Fermanagh.
E	Sheila Hughes, Morden.	J	Andrew Stokes, Leicester.

Short Wave Reports

The propagation conditions in the **25MHz (11m)** band are now so unreliable that it is no longer being used by international broadcasters.

Daily variations in propagation were evident in the **21MHz (13m)** band. Sometimes R.Australia's broadcast to Asia via Darwin on 21.725 (Eng 0630-1100) could be heard very clearly in the UK. At best it was 55544 at 0923 by **Gerry Haynes** in Bushey Heath; 55545 at 0951 by **Michael Griffin** in Ross-on-Wye; 55444 at 1011 by **James Duckworth** in Barnet; 45334 at 1030 in Burnham-on-Crouch; 33333 at 1055 by **Martin Dale** in Stockport.

Some other broadcasts noted in the morning came from BSKSA Saudi Arabia 21.495 (Ar [Holy Koran] to SE.Asia 0900-1200) rated 53244 at 0914 in Newry; UAER, Abu Dhabi 21.630 (Ar to N.Africa, Eu 0730?-1455) 24333 at 0958 by **Rhoderick Illman** in Oxted; DW via ? 21.540 (Ger to E.Asia? 1000-1200?) 45554 at 1010 by **John Parry** in Larnaca, Cyprus; DW via Julich? 21.560 (Ger to Asia 1000-1400) 24333 at 1006 in Oxted; UAER, Dubai 21.605 (Eng to Eu 1030-1055) SIO455 at 1030 by **Kenneth Buck** in Edinburgh; R.Ukraine Int 21.800 (Uk WS 0900-1700?) 33333 at 1037 by **Charles Beanland** in Gibraltar; BBC via Ascension Is 21.660 (Eng to W/E/S.Africa 1100-1700) 35343 at 1108 by **Tim Allison** in Middlesbrough; R.Nederlands via Flevo? 21.505 (Eng, Du? to Asia, Far East 0930-1125) SIO322 at 1112 by **Bill Clark** in Rotherham; Vatican R, Italy 21.850 (Sp to C/S.Am 1100-1215) 34243 at 1150 by **Peter Pollard** in Rugby.

Those received after mid-day originated from UAER, Dubai 21.605 (Ar to Eu 1055-1330) rated 44444 at 1305 in Kilkeel; RAI Rome 21.535 (Tt [Home service relay to Lat Am] Sun only 1330-1700) 25332 at 1400 by **Darren Beasley** in Bridgwater; HCJB, Ecuador 21.455 (Eng, u.s.b. + p.c.) 44433 at 1540 in Bushey Heath; WYFR via Okeechobee 21.745 (Eng to Eu 1600-1645) 44434 at 1600 by **Bernard Curtis** in Stalbridge; BBC via Ascension Is 21.660 (Eng to W/E/S.Africa 1100-1700) SIO322 at 1605 by **Philip Rambaut** in Macclesfield; Monitor R.Int via WSHB 21.640 (Eng to E.Africa 1600-1850?) SIO444 at 1650 in Edinburgh.

Daily variations in propagation were also evident in the **17MHz (16m)** band. In the morning R.Pakistan, Islamabad 17.900 (Eng to Eu 0800-0845) was SIO433 at 0800 by **Tom Smyth** in Co.Fermanagh; R.Australia via Carnarvon 17.715 (Eng to N.Asia 0200-0400, 0500-0900) 34323 at 0835 in Newry; BBC via Ascension Is 17.830 (Eng to W/C.Africa 0730-2030) 23422 at 0913 in Middlesbrough; AIR Delhi 17.387 (In to Indonesia 0845-0945) 32222 at 0920 in Stalbridge & (Eng to Pacific areas 1000-1100) SIO322 at 1058 in Rotherham; Channel Africa via Meyerton 17.810 (Eng to Africa 1000-1100) 23333 at 1036 in Oxted;

Medium Wave Chart

Freq kHz	Station	Country	Power (kW)	Listener
520	Hof-Saale (BR)	Germany	0.2	G*
531	Ain Beida	Algeria	600	B*,C*,I*,L,O,S*
531	Leipzig	Germany	100	N,O,S*
531	RNE5 via ?	Spain	?	B*,N,O*
540	Wavre	Belgium	150/50	A,C,F,L,N,O,S*
540	Sidi Bennour	Morocco	600	B*,I*,N*,O*
549	Les Trembles	Algeria	600	B*,F*,I*,J*,L, N*,O*,S*
549	Thurmau (OLF)	Germany	200	C,F,N,O,S*
558	Espoo	Finland	100	O*
558	Rostock(NOR)	Germany	20	N*
558	Tirgu Jiu	Romania	200	O*
558	RNE5 via ?	Spain	?	B*,N*,O
567	Berlin	Germany	100	N*,S*
567	Tullamore(RTE1)	Ireland (S)	500	C,F,L,O,R,S*
567	Laayoune	Morocco	50	I*
567	RNE5 via ?	Spain	?	B*,C*,L*,N*,O*
576	Muhlacker(SOR)	Germany	500	C,F,N*,O,S*
576	Riga	Latvia	500	L*,O*
576	Barcelona(RNE5)	Spain	50	B*,C*,N*,O*
585	Paris(FIP)	France	8	C,N*,O,S*
585	Madrid(RNE1)	Spain	200	B*,C*,F*,L*,N*, O,R*,S*
585	Gafsa	Tunisia	350	I*,O*
585	Oumfries(BBCScot)	UK	2	A
594	Frankfurt(HR)	Germany	1000/400	C,F*,N,O,S*
594	Oujda-1	Morocco	100	B*,I*,O*,S*
594	Muge	Portugal	100	N*
603	Sevilla(RNE5)	Spain	50	B*,L*,N*,O*
603	Newcastle(BBC)	UK	2	A,F*,R
612	Athlone(RTE2)	Ireland (S)	100	C*,F,L,O,R,S*
612	RNE1 via ?	Spain	10	B*,F*,N*,O,S*
621	Wavre	Belgium	80	C,F,L,N,O
621	Barcelona(OCR)	Spain	50	B*,O*
621	Santa Cruz(RNE1)	Tenerife	100	F*
630	Vigra	Norway	100	B*,C*,L*,N,O*,R*,S*
630	Tunis-Ojedeida	Tunisia	600	B*,C*,F*,J*, L*,N*,O*
639	Praha(Liblice)	Czech	1500	B*,F*,J,O
639	RNE1 via ?	Spain	?	B*,C*,F*,K,L*, N,O*,S*
648	RNE1 via ?	Spain	10	L*,N*,O*
648	Orfordness(BBC)	UK	500	C,F,L,O,S*
657	Neubrandenburg (NOR)	Germany	250	N*,O*,S*
657	Madrid(RNE5)	Spain	20	B*,C*,N*,O*,S*
657	Wrexham (BBCWales)	UK	2	A,C,F,L,S
666	Bodensees'dr(SWF)	Germany	300/180	C*,N*
666	R.Vilnius	Lithuania	500	N*
666	Lisboa	Portugal	135	B*,C*,N*,O*
666	Barcelona(COPE)	Spain	10	S*
675	Marseille	France	600	O*,R*
675	Lopic(R10 Gold)	Holland	120	A,B*,C,F,K,L,N*,O,S
684	Sevilla(RNE1)	Spain	500	B*,C*,F*,L*,N*,O*
684	Avala(Beograd-1)	Yugoslavia	2000	C*,F*,N*,O,S*
693	Burghead(BBC5)	UK	50	R
693	Oroitwich(BBC5)	UK	150	C,F,L,O,S
702	Flensburg(NOR)	Germany	5	N*,O*
702	Zamora(RNE1)	Spain	10	B*,C*,N*,O*,S*
711	Rennes 1	France	300	C,K,L,N*,O,S*
711	Laayoune	Morocco	600	C*
711	Murcia(COPE)	Spain	5	B*,N*,O*,S*
720	Langenberg	Germany	200	O
720	Lisnagarvey(BBC4)	Ireland (N)	10	F,L*,O,R*
720	Norte	Portugal	100	L*,N*,S*
720	Lots Rd,Ldn(BBC4)	UK	0.5	C,L,S*
729	Cork(RTE1)	Ireland (S)	10	F,O
729	RNE1 via ?	Spain	?	B*,C*,F*,L*,N*,O,S*
738	Paris	France	4	O
738	Poznan	Poland	300	B*,O
738	Barcelona(RNE1)	Spain	500	B*,C,F*,L*,N,O*,S*
747	Flevo(Hilv2)	Holland	400	A,C,F,L,N,O,S*
747	Cadiz(RNE5)	Spain	10	L*,O*
756	Braunschweig(DLF)	Germany	800/200	C*,F*,N,O,S*
756	Lugoj	Romania	400	O*
756	Bilbao(EI)	Spain	5	L*,N*,O*
765	Sottens	Switzerland	500	B*,L*,N*,O,S*
774	Abis	Egypt	500	I*,O*
774	Enniskillen(BBC)	Ireland (N)	1	R
774	RNE1 via ?	Spain	?	B*,F*,L*,N*,O,S*
783	Burg	Germany	1000	C*,N*,O,S*
783	Miramar(R.Porto)	Portugal	100	B*,N*,O*
783	Oammam	Saudi Arabia	100	O*,S*
792	Limoges	France	300	N*,O,R*
792	Lingen(NOR)	Germany	5	O*
792	Sevilla(SER)	Spain	20	B*,C*,L*,N*,O*
801	Munchen-Ismaning	Germany	300	C*,N*,O*,S*
801	St.Petersburg	Russia	1000	I*,O*
801	RNE1 via ?	Spain	?	B*,C*,L*,N*,O*
810	Madrid(SER)	Spain	20	B*,C*,L*
810	Burghead(BBCScot)	UK	100	R
810	Westergie (BBCScot)	UK	100	C*,F,K,O,S*
819	Batra	Egypt	450	C*,I*,J*,O*,S*
819	Toulouse	France	50	C*,O
819	Rabat	Morocco	25	G*
819	Warsaw	Poland	300	B*,C*,N*,O*
819	S.Sebastian(EI)	Spain	5	B*
828	Hannover(NOR)	Germany	100/5	C*,N,S*
828	Barcelona(SER)	Spain	50	B*,C*
837	Nancy	France	200	N*,O,R*
837	COPE via ?	Spain	?	B*,C*,N*,O*
837	Kharkov	Ukraine	150	I*
846	Rome	Italy	540	B*,C*,J,K,L*,O*,S*
855	Berlin	Germany	100	C*,N*,O,R*,S*
855	RNE1 via ?	Spain	?	B*,C*,F*,J,L*, N*,O,S*

Freq kHz	Station	Country	Power	Listener (kW)
864	Santah	Egypt	500	C*,I*,O*
864	Paris	France	300	C,L,N*,O
864	Socuellamos(RNE1)	Spain	2	B*,G*,L*,S*
873	Frankfurt(AFN)	Germany	150	A*,C*,F,K,L*, N*,O*,S*
873	Zaragoza(SER)	Spain	20	B*,L*,N*,O*
873	Enniskillen(R.UI)	UK	1	J
882	COPE via ?	Spain	?	B*,N*,O*
882	Washford (BBCWales)	UK	100	C,F,K,L,O,R,S*
891	Algiers	Algeria	600/300	B*,C*,F*,J*, L*,O*,S*
891	Huisberg	Netherlands	20	J*,K,N*,O
900	Milan	Italy	600	B*,C*,N*,O*,S*
900	COPE via ?	Spain	?	B*,N*,O*
900	Qurayyat	Saudi Arabia	1000	O*
909	B'mans Pk(BBC5)	UK	140	F,L,O,R,S*
909	M'side Edge(BBC5)	UK	200	C
918	Plesivec(Sloven'nR)	Yugoslavia	600/100	B*,C*,I*,L*,O*
918	Madrid(R.Int)	Spain	20	B*,C*,I*,L*, N*,O*,S*
927	Wolvertem	Belgium	300	A*,C,F,K,L,N*,O,R*
936	Bremen	Germany	100	C*,F*,N*,O,S*
936	Venezia	Italy	20	B*,O*
936	RNE5 via ?	Spain	?	B*,R*
936	Lvov	Ukraine	500	C*
945	Toulouse	France	300	N*,O,R*
954	Brno(Oobrochov)	Czech Rep.	200	B*,J,N*,O*
954	Madrid(CI)	Spain	20	B*,C*,F*,L*,N*,O*
963	Pori	Finland	600	B*,C*,G*,L,N*,O
963	Paris	France	8	N*,O,S*
963	Tir Chonaill	Ireland (S)	10	O*,R*,S*
963	Tunis-Djedeida	Tunisia	200	I*
972	Hamburg(NOR)	Germany	300	C*,F*,N*,O,S*
972	RNE1 via ?	Spain	?	B*,I*
972	Nikolayev	Ukraine	500	N*
981	Aiger	Algeria	600/300	B*,C*,J*,N*,O,S*
990	Berlin	Germany	300	C*,L*,O*
990	R.Bilbao(SER)	Spain	10	B*,C*,F*,N*,O*,S*
999	Schwerin (RIAS)	Germany	20	N*,R*
999	Madrid(COPE)	Spain	50	B*,C*
1008	Las Palmas(SER)	G. Canaria	?	B*,O*,S*
1008	Flevo(Hilv-5)	Holland	400	A*,C,F,L,N,O
1017	Rheinsender(SWF)	Germany	600	A*,C*,N*,O,R*,S*
1017	RNE5 via ?	Spain	?	B*,I*,N*,O*
1026	Graz-Dobl	Austria	100	O*
1026	SER via ?	Spain	?	B*,N*,O*
1035	Taliinn	Estonia	500	O*
1035	Lisbon(Prog3)	Portugal	120	F*,N*,T
1044	Dresden	Germany	250	I*,S*
1044	Sebaa-Aioun	Morocco	300	B*,G*,L*,O*
1044	S.Sebastian(SER)	Spain	10	B*,C*,I*,N*,S*
1053	Iasi	Romania	1000	C*
1053	Zarogoza(COPE)	Spain	10	B*,C*,F*,N*,O,S*
1053	Talk Radio UK via ?	UK	?	O,E,N,S
1062	Kalundborg	Oenmark	250	B*,C,F,L*,N*,O,R*
1062	Norte	Portugal	100	I*
1071	France-Inter via ?	France	?	C,F,K,L,N*,O
1071	Bilbao(EI)	Spain	5	B*,N*,O*,S*
1080	Katowice	Poland	1500	B*,C*,L*,O
1080	SER via ?	Spain	?	B*,C*,F*,L*, N*,O,S*
1089	Ourres	Albania	150	O*
1089	Krasnodar	Russia	300	C*,N*
1089	Talk Radio UK via ?	UK	?	O,E,N,S
1098	Nitra(Jarok)	Slovakia	1500	B*,C*,F*,N*,O*,S*
1098	RNE5 via ?	Spain	?	B*,N*,O*
1107	Batra	Egypt	600	I*
1107	AFN via ?	Germany	10	A*,B*,C*,N*,S*
1107	Sitkunai	Lithuania	150	I*,O*
1107	RNE5 via ?	Spain	?	B*,N*,O*,R*
1107	Talk R.UK Liverpool	UK	?	O,N
1116	Bari	Italy	150	B*,C*,L*,O*
1116	Pontevedra(SER)	Spain	5	B*,N*
1125	La Louviere	Belgium	20	C*,F*,O*
1125	Deanovec	Croatia	100	C*,O*
1125	RNE5 via ?	Spain	?	B*,C*,F*,N*,O*,S*
1134	COPE via ?	Spain	2	B*,N*,O*
1134	Zadar(Croatian R)	Yugoslavia	600/1200	B*,C*,N*,O*,S*
1143	AFN via ?	Germany	1	A*,C*
1143	Stuttgart(AFN)	Germany	10	B*,N*
1143	Bolshakovo(Mayak)	Russia	150	N*
1143	COPE via ?	Spain	2	B*,I*,N*,O*,S*
1152	RNE5 via ?	Spain	10	B*,O*
1161	Strasbourg(Fint)	France	200	C*,N*,O*
1161	S.Sebastian(EI)	Spain	50	O*
1170	Vila Real	Portugal	10	N
1170	Beli Kriz	Slovenia	300	I*
1179	SER via ?	Spain	?	N*,O*,S*
1179	Solvesborg	Sweden	600	C*,F*,L,N*,O,R*,S*
1188	Kuurne	Belgium	5	C,F*,N*,O*,S*
1188	Szolnok	Hungary	135	B*,N*,O*
1197	Munich(VOA)	Germany	300	N*,S*
1197	Virgin via ?	UK	?	C,F,L,O,S
1206	Bordeaux	France	100	N*,O,S
1206	Wroclaw	Poland	200	C*,F*,O*
1215	Virgin via ?	UK	?	C,L,O,R,S
1224	Vidin	Bulgaria	500	B*
1224	Virgin via ?	UK	?	C*,L,O*,R*
1233	Liege	Belgium	5	B*,C*,O*
1233	Nitra	Slovakia	40	N*
1233	Virgin via ?	UK	?	C*,F,L,O,S
1242	Kiev	Ukraine	150	I*
1242	Virgin via ?	UK	?	C*,F,L,S
1251	Marcali	Hungary	500	B*,C*,N*,O*,S*
1251	Huisberg	Netherlands	10	B*,N*,O*
1251	Oubai	UAE	600	O*
1260	SER via ?	Spain	?	B*,N*,O*

Freq kHz	Station	Country	Power	Listener (kW)
1260	Guildford (V)	UK	?	C*,O
1260	Kharkiv	Ukraine	50	I*
1269	Neumunster(OLF)	Germany	600	C*,F,L,N*,O*,R*,S*
1278	Strasbourg	France	300	O*
1278	Dublin/Cork(RTE2)	Ireland (S)	10	A*,C*,F,L,O*, R*,S*,T
1287	RFE via ?	Czech Rep.	400	B*,C*,N*,O*,S*
1287	Lerida(SER)	Spain	10	L*,O*,S*
1296	Kardzali	Bulgaria	150	B*
1296	Valencia(COPE)	Spain	10	B*,L*,N*,O*,S*
1296	Orfordness(BBC)	UK	500	C,L*,O*
1305	Constantine	Algeria	20	I*
1305	Rzeszow	Poland	100	C*,F*,N*,R*
1305	RNE5 via ?	Spain	?	B*,C*,F*,O*,S*
1314	Kvitsoy	Norway	1200	B*,C,F,L,N*,O,R*,S*
1323	Wachenbrunn(VoR)	Germany	1000/150	B*,C,F,L,N,R*
1332	Rome	Italy	300	B*,C*,N*,O*
1341	Lakihegy	Hungary	300	C*
1341	Lisnagarvey(BBC)	Ireland (N)	100	C,F,J,L*,O,S*
1341	Tarrasa(SER)	Spain	2	O*
1341	Santa Cruz	Teneriffe	20	F*
1350	Nancy/Nice	France	100	C*,L*,N*,O,S*
1350	Cesvaine/Kuldiga	Latvia	50	I*,O*
1359	Arganda (RNE-FS)	Spain	600	B*,C*,F*,N*, O*,R,S*
1368	Foxdale(Manx R)	I.O.M.	20	A*,F,H,J,O*,R
1368	Krakow	Poland	60	F*,I*
1377	Lille	France	300	C,N*,O,S*
1377	Ukraine	Ukraine	50	I*
1386	Bolshakovo	Russia	2500	B*,C*,N*,O,S*
1395	Lushnje(Tirana)	Albania	1000	B*,C*,F*,N*,O*,S*
1404	Ajaccio	France	20	L
1404	Brest	France	20	B*,C*,F*,N*,O,S*
1413	Masirah Is(BBC)	Oman	1500	I*
1413	RNE5 via ?	Spain	?	B*,C*,F*,L*, N*,O*,S*
1422	Alger	Algeria	50/25	I*,N*
1422	Heusweiler(DLF)	Germany	1200/600	C*,L*,N*,O,S*
1422	Valmiera	Latvia	50	I*
1431	Nikolayev	Ukraine	400	I*,S*
1440	Marnach(RTL)	Luxembourg	1200	A*,C,F*,J*,O,R
1440	Damman	S. Arabia	1600	G*,I*,J*,N*,O*
1449	Squinzano	Italy	50	B*,C*,I*,O*
1449	Redmoss(BBC)	UK	2	R*
1458	Lushnje(Tirana)	Albania	500	B*,I*,L*,S*
1467	Monte Carlo(TWR)	Monaco	1000/400	C*,F*,L*,N*,O*,R*
1476	Wien-Bisamberg	Austria	600	F*,S*
1476	Lviv	Ukraine	120	I*
1485	SER via ?	Spain	?	B*,S*
1494	Clermont-Ferrand	France	20	I*,O
1494	Al Karanah	Jordan	1000	I*,N*
1494	St.Petersburg	Russia	1000	B*,C*,N*,O*,S*
1503	Stargard	Poland	300	B*,C*,F*
1503	Rome	Italy	2	J*
1503	RNE5 via ?	Spain	?	O*
1512	Wolvertem	Belgium	600	A*,C,J*,L*,N*, O,O*,S*
1512	Jeddah	Saudi Arabia	1000	I*,R*
1521	Kosice(Cizatice)	Slovakia	600	C*,F*,N*,O*,S*
1521	Duba	Saudi Arabia	2000	C*,I*,O*
1521	R.Manresa(SER)	Spain	2	O*
1530	Vatican R	Italy	150/450	B*,C*,F*,N*,O,S*
1539	Mainflingen(DLF)	Germany	700	C*
1539	Valladolid(SER)	Spain	5	O*
1557	Kaunas (R.Vilnius)	Lithuania	75	C*
1566	Tartu	Estonia	2.5	I*
1566	Nagpur	India	1000	M*,P*
1566	Bandarabbas	Iran	100	I*,M*
1566	Sfax	Tunisia	1200	B*,I*
1566	Odessa	Ukraine	7	G*,I*,N*
1575	Genova	Italy	50	B*,C*,N*,S*
1575	SER via ?	Spain	5	B*,C,F*,L*,N*,O*,S*
1584	SER via ?	Spain	2	B*,L*,R*,S*
1593	Matruh	Egypt	10	I
1593	Holzkirchen(RFE)	Germany	150	C,N*,O*,R*
1593	Dnipropetrovsk	Ukraine	5	I,N*
1602	Al Oakhla	Egypt	10	I*
1602	Bolzano	Italy	2	I*
1602	SER via ?	Spain	?	B*,O*,R*,S*
1602	Vitoria(EI)	Spain	10	B*,L*,O*
1611	Vatican R	Italy	15	N*

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

Listeners:

- A Tim Allison, Middlesborough.
- B Darren Beasley, Bridgwater.
- C Paul Bowery, Burnham-on-Crouch.
- D John Court, Birmingham.
- E Bernard Curtis, Stalbridge.
- F Martin Dale, Stockport.
- G John Eaton, Woking.
- H Arthur Grainger, Carstairs Junction.
- I Gerry Haynes, Bushey Heath.
- J Sheila Hughes, Morden.
- K Rhoderick Illman, Oxted.
- L Tony King, Swindon.
- M Paul Logan, Lisnaskea.
- N Eddie McKeown, Newry.
- O George Millmore, Wootton IoW.
- P Roy Patrick, Oerby.
- Q Clare Pinder, Appleby.
- R Tom Smyth, Co.Fermanagh
- S Andrew Stokes, Leicester.
- T Bernard Tyers, Co.Waterford.

Local Radio Chart

Freq kHz	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum R	I	7.50	B,D,F*,I,K,M,N
585	R.Solway	B	2.00	E,J
603	Cheltenham (CD603)	I	0.10	D,F*,I,K,M,N
603	Invicta SG (Coast)	I	0.10	B,F*,K,N
630	R.Bedfordshire (3CR)	B	0.20	B,D,F*,H,I,K,M,N
630	R.Cornwall	B	2.00	K
657	R.Clwyd	B	2.00	E,F,I,K,M,N
657	R.Cornwall	B	0.50	K
666	Gemini AM	I	0.34	F,I,K,L*,N
666	R.York	B	0.80	A,C*,D,E,F,M
729	BBC Essex	B	0.20	B,E*,F*,H,I,K,L*,M
738	Hereford/Worcester	B	0.037	D,F,I,K,M
756	R.Cumbria	B	1.00	E,J
756	R.Maldwyn	I	0.63	D,F,I,K,N
765	BBC Essex	B	0.50	B,D,E*,F,I,K,M,N
774	Gloucester (3CSG)	I	0.14	E*,F,I,K,M
774	R.Kent	B	0.70	B,E*,F*,K,M,N
774	R.Leeds	B	0.50	A,D
792	Chiltern (S.Gold)	I	0.27	B,D,E*,F*,I,K,M,N
792	R.Foyle	B	1.00	E
801	R.Devon & Dorset	B	2.00	F,J*,K,N
828	Chiltern (S.Gold)	I	0.20	B,F*,N
828	R.Aire (Magic828)	I	0.12	A,D
828	2CR (Cl.Gold)	I	0.27	K,M
837	R.Cumbria/Furness	B	1.50	E
837	R.Leicester	B	0.45	B,D,E,F*,H,I,K,M,N
855	R.Devon & Dorset	B	1.00	K
855	R.Lancashire	B	1.50	A,D,E
855	R.Norfolk	B	1.50	B,F,G,H,N
855	Sunshine R	I	0.15	F,G,I,M,N
873	R.Norfolk	B	0.30	B,D,F*,G,H,I,K,L*,M,N
936	Brunel R (Cl.Gold)	I	0.18	F,H,I,K,M,N
945	R.Trent (Gem AM)	I	0.20	B,D,E,F*,I,K,M,N
954	Gemini AM	I	0.32	H,K,N
954	R.Wyvern (WYVN)	I	0.16	D,E,F,I,M,N
990	WABC (Nice & Easy)	I	0.09	D,F,I,N
990	R.Aberdeen	B	1.00	J*
990	R.Devon & Dorset	B	1.00	F,K
990	Hallam R (Gt.Yks)	I	0.25	D,F,M
999	R.Solent	B	1.00	B,F,H,K,N
999	R.Trent (Gem AM)	I	0.25	F,M,N
999	Red Rose (Gold)	I	0.80	D,E,J
1017	Beacon R (WABC)	I	0.70	D,E,F*,I,K,M,N
1026	Downtown R	I	1.70	E,L
1026	R.Cambridgeshire	B	0.50	B,F*,G,I,M,N
1026	R.Jersey	B	1.00	F,G,I,K,N
1035	Country 1035	I	?	B,D*,E*,F*,I,K,N
1035	NorthSound Two	I	0.78	E,J*
1035	R.Sheffield	B	1.00	D,L,M
1035	West Sound AM	I	0.32	E
1107	Moray Firth R	I	1.50	E,F,J
1116	R.Derby	B	1.20	D,E,F,I,M,N
1116	R.Guernsey	B	0.50	F,I,K,N
1152	BRMB (Xtra-AM)	I	3.00	F*,M
1152	Great North R (GNR)	I	1.80	C*
1152	LBC (LondonNewstalk)	I	23.50	B,F*,K,L*,N
1152	Piccadilly R (Gold)	I	1.50	D
1152	R.Broadland	I	0.83	B,D*,J*,N
1152	R.Clyde (Clyde 2)	I	3.06	E
1161	Brunel R (Cl.Gold)	I	0.16	F,I,K,N
1161	R.Bedfordshire (3CR)	B	0.10	F*,M,N
1161	Southern Counties R	B	1.00	B,K,N
1161	Tay AM	I	1.40	E,J*,L*
1161	Humberside (Gt.Yks)	I	0.35	D
1170	GNR Teeside	I	0.32	C*,E
1170	Hi Wycombe 1170AM	I	?	F*,N
1170	Portsmouth (SCR)	I	0.12	F,K,N
1170	R.Orwell (SGR)	I	0.28	B,E,F*,J*
1170	Signal R (S.Gold)	I	0.20	D,M
1170	Swansea Sound	I	0.58	M
1242	Invicta Snd (Coast)	I	0.32	B,F,N
1242	Isle of Wight R	I	0.50	F,K,N
1251	Saxon R (SGR)	I	0.76	B,E,F,G,I,L*,M,N
1260	Brunel R (Cl.Gold)	I	1.60	E,F,I,K
1260	Marcher Snd (Gold)	I	0.64	D,E,F
1260	Sunrise R, Midlands	I	0.29	E,F,M,N
1260	R.York	B	0.50	E
1278	Bradford (Gt.Yks)	I	0.43	F
1305	Barnsley (Gt.Yks)	I	0.15	D,E,F,M
1305	Touch R	I	0.20	E,F,J*,I,K,N
1323	R.Bristol (Som.Snd)	B	0.63	D,F,I
1323	Brighton (SCR)	I	0.50	F,K,N
1332	Hereward R (WGMS)	I	0.60	B,E,F,M,N
1332	Wiltshire Sound	B	0.30	E*,F,I,K,N
1359	Essex R (BreezeAM)	I	0.28	B,F,N
1359	Mercia Snd (Xtra-AM)	I	0.27	F,J*,M
1359	Red Dragon (Touch R)	I	0.20	F
1359	R.Solent	B	0.85	J*,K
1368	R.Lincolnshire	B	2.00	B*,E,F,M,N
1368	Southern Counties R	B	0.50	B,F,G*,K,N
1368	Wiltshire Sound	B	0.10	F,I,J*,K
1431	Essex R (BreezeAM)	I	0.35	B,D*,E,F,K,M,N
1431	R 210 (Cl.Gold)	I	0.14	D*,E,F,I,J*,K,N
1449	R.Peterboro/Cambs	B	0.15	F,G,K,M,N
1458	Fortune	I	5.00	D,E,I,J*,L*
1458	R.Cumbria	B	0.50	E,J*
1458	R.Devon & Dorset	B	2.00	K
1458	R.Newcastle	B	2.00	C*
1458	Sunrise R	I	50.00	B,D*,E,F,K,N
1476	Guildford (M.Xtra)	I	0.50	A*,B*,E,F,I,J*,K,M*,N
1485	R.Humberside	B	1.00	F,J*
1485	R.Merseyside	B	1.20	D,E,F,J*,L,M
1485	Southern Counties R	B	1.00	B,E,F,I,K,N
1503	R.Stoke-on-Trent	B	1.00	B*,D,E,F,I,J,K*,M
1521	Reigate (M.Xtra)	I	0.64	A*,B,E,F,I,J*,K,M*,N
1530	Huddersfld (Gt.Yks)	I	0.74	D,E,F
1530	R.Essex	B	0.15	B,E,F,K,M,N
1530	R.Wyvern (WYVN)	I	0.52	E,F,I,J*,K,M
1548	Capital R (Cap G)	I	97.50	B,F,I,K,N
1548	R.Bristol	B	5.00	F*,I,K,M
1548	Liverpool (City G)	I	4.40	B,D,J*,L*
1548	R.Forth (Max AM)	I	2.20	E,F*,J*
1557	Chiltern R (Gold)	I	0.76	D,F,I,J*,M
1557	Southampton (SCR)	I	0.50	F,K,N
1557	R.Lancashire	B	0.25	D,J*
1557	Tendring (Mellow)	I	0.125	B,F*,N
1584	Kettering (KCBC)	I	0.04	E,F,K*,M,N
1584	R.Nottingham	B	1.00	D,E,F,G*,M
1584	R.Shropshire	B	0.50	F,K
1584	R.Tay	I	0.21	E
1602	R.Kent	B	0.25	B,E,F,J*,K,M,N

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

Listeners:

A	Tim Allison, Middlesbrough.
B	Paul Bowery, Burnham-on-Crouch.
C	Steve Brown, Newcastle-upon-Tyne.
D	Martin Dale, Stockport.
E	Arthur Grainger, Carstairs Junction.
F	Gerry Haynes, Bushey Heath.
G	Sheila Hughes, Morden.
H	Rhoderick Illman, Oxted.
I	Tony King, Swindon.
J	Eddie McKeown, Newry.
K	George Millmore, Wootton, IoW.
L	Tom Smyth, Co.Fermanagh.
M	Andrew Stokes, Leicester.
N	John Wells, East Grinstead.

R.Austria Int via Moosbrunn 17.870 (Ger, Eng to Aust 0800?-1100?) 33323 at 1045 in Gibraltar; Israel R, Jerusalem 17.575 (Eng to Eu? 1100-1130?) 55555 at 1100 by **Clare Pinder** in Appleby; DW via Kigali? 17.800 (Eng to W.Africa 1100-1150) 44344 at 1110 by **Chris Shorten** in Norwich.

Later, the Voice of Russia 17.775 (Eng [WS] to Asia) was rated SIO222 at 1302 by **Julian Wood** in Elgin; RCI via Sackville 17.820 (Eng [CBC progs] to USA, Caribbean 1200-1300 Mon-Fri, 1300-1600 Sun) 43443 at 1315 in Kilkeel and 42323 at 1500 in Stockport; Africa No.1, Gabon 17.630 (Fr to W.Africa 0700-1600) 34443 at 1350 in Woking; RTM Tanger, Morocco 17.595 (Fr, Eng to M.East, N.Africa 1400-1700) 44544 at 1459 in Bridgwater; HCJB Quito 17.490 (Eng, u.s.b. + p.c) 43333 at 1500 by **Sheila Hughes** in Morden; R.Nederlands via Bonaire 17.605 (Eng to W.Africa 1830-2025) 45444 at 1842 in Bushey Heath.

Broadcasts from many areas were noted in the **15MHz (19m)** band. In the morning R.Austria Int via Moosbrunn 15.450 (Ger, Eng to Aust 0800-1100) was 55545 at 0830 in Ross-on-Wye; R.Pakistan, Islamabad 15.625 (Eng? to Eu 0900-0945) 43333 at 0940 in Stalbridge; Voice of Greece, Athens 15.650 (Gr, Eng to Azores 0900-0950) 35444 at 0941 in Middlesbrough; RNE via Noblejas 15.110 (Sp to M.East 0900-1700) 33233 at 1023 in Gibraltar; UAER, Dubai 15.395 (Eng to Eu 1030-1100) SIO433 at 1030 in Edinburgh; Voice of Malaysia, Kajang 15.295 (Mand to S.Asia 1030-1230) 22432 at 1130 in Bridgwater; HCJB Quito 15.115 (Eng to S.Am 1130?-1430?) 34222 at 1157 in Barnet.

After mid-day R.Australia via Darwin 15.530 (Eng to S.Asia 1100-1300) rated SIO433 at 1230 in Macclesfield; ISBS Reykjavik 15.775 (Ic [u.s.b. + p.c.] to Eu 1215-1300) 45554 at 1256 in Wallsend; Israel R, Jerusalem 15.640 (Eng to Eu, N.Am 1400-1425) 44454 at 1403 in Woking; WWCR Nashville 15.685 (Eng to Eu 1200-2215?) 44343 at 1414 by **Bernard Tyers** in Co.Waterford; RCI via Sines? 15.325 (Eng to Eu, M.East, Africa 1430-1500?) 33433 at 1436 in Oxted; R.Japan via Moyabi 15.355 (Eng to S.Africa 1500-1600) SIO232 at 1510 in Rotherham; China R.Int via Mali 15.130 (Eng to E/S.Africa 1600-1655) 44433 at 1606 in Bushey Heath; BBC via Sackville 15.260 (Eng to N.Am 1500-1700) SIO323 at 1610 by **John O'Halloran** in Harrogate; Channel Africa via Meyerton 15.240 (Eng to Africa 1600-1700) 54444 at 1615 in Norwich; WEWN Birmingham 15.695 (Eng to Eu? 1600-1658) 44333 at 1625 in Newry; WINB Red Lion 15.715 (Eng to Africa, Eu 1600-1900) 32112 at 1655 in Stockport; HCJB Quito 15.490 (Eng to Eu 1700-2000) SIO322 at 1700 in Co.Fermanagh; KTBN Salt Lake City, USA 15.590 (Eng to N.Am 1600-0000?) 25542 at 1735 by **Ross Lockley** in Stirling.

During the evening RNB Brazil 15.265 (Eng, Ger to Eu 1800-2020) was 45222 at 1820 in Burnham-on-Crouch; R.Nederlands via Bonaire 15.315 (Eng to S/E/W.Africa 1830-2025) 44444 at 1835 by **Steve Brown** in Newcastle-upon-Tyne; WYFR via Okeechobee 15.566 (Eng to Eu 1600?-1855?) 34333 at 1848 by **Vera Brindley** in Woodhall Spa; BBC via Ascension Is 15.400 (Eng to Africa 1500-2300) 44433 at 2108 in E.Worthing; RAE Buenos Aires, Argentina 15.345 (Eng, It, Fr, Ger, Sp to Eu, Africa 1800-2300) 33222 at 2115 in Rugby.

The broadcasters using the **13MHz (22m)** band include Monitor R.Int via KHBI Saipan 13.615 (Eng to Oceania 0800-1000), logged as 33323 at 0910 in Morden; R.Austria Int via Moosbrunn 13.730 (Ger, Eng, Fr, Sp to Eu 0400-1800) 44434 at 0953 in Middlesbrough; BBC via Rampisham 13.660 (Ar to M.East, Africa 1230-2100) 54444 at 1230 in Woking; ISBS Reykjavik 13.860 (Ic [u.s.b.+ p.c] to Eu 1215-1300) SIO444 at 1237 by **John Slater** in Scalloway; R.Tashkent, Uzbekistan 13.785 (Eng to S.Asia 1330-1358) 45554 at 1332 in Wallsend; WYFR via Okeechobee 13.695 (Eng to N.Am 1300-1400) 33333 at 1359 in Bridgwater; R.Nederlands via Flevo 13.700 (Eng to S.Asia, M.East 1330-1525) 45554 at 1400 in Newry; R.Kuwait, Kabd 13.620 (Ar to Eu, N.Am 1315-1745) SIO344 at 1550 in Edinburgh; UAER, Dubai 13.675 (Eng to Eu 1600-1640) 45444 at 1632 in Bushey Heath; WWCR Nashville 13.845 (Eng to E.USA 1200-0200) SIO322 at 1645 in Rotherham; SRI via Sottens? 13.635 (Eng, Ger, It, Fr to M.East, E.Africa 1700-1900) SIO211 at 1700 in Co.Fermanagh; VOA via Selebi-Phikwe 13.710 (Eng to Africa 1630-2230) 43333 at 1820 in Stalbridge; WJCR via Millerstown 13.595 (Eng 24hrs) 33333 at 2015 in Kilkeel; WHRI South Bend 13.760 (Eng to E.USA, Eu 1600-0000?) 35333 at 2130 in Ross-on-Wye.

In the **11MHz (25m)** band Slovak R.Int, via Velke Kostolany 11.990 (Eng to Aust 0830-0857) was SIO323 at 0830 in Co.Fermanagh; R.Romania Int, Bucharest 11.940 (Eng to Eu 1300-1400) SIO533 at 1305 by **Tony King** in Swindon; Voice of the Mediterranean, Malta 11.925 (Eng, Ar to N.Africa 1400-1600) 33333 at 1417 by **George Tebbitts** in Penmaenmawr; R.Australia via Carnarvon 11.660 (Eng to S.Asia 1430-1800) 45444 at 1500 in Barnet and SIO433 at 1551 in Macclesfield and via Shepparton 11.695 (Eng to Asia 1430-1700) SIO333 at 1600 in Edinburgh; BBC via Lesotho 11.940 (Eng to C/W.Africa 0800-1830) SIO343 at 1635 in Harrogate; R.Thailand, Bangkok 11.855 (Eng to S.E.Asia? 1900-2000) 15211 at 1905 in Burnham-on-Crouch; R.Kuwait via Kabd 11.990 (Eng to Eu 1800-2100) 25444 at 1957 in Co.Waterford; R.Globo, Rio de Janeiro 11.805 (Port 0900-0330) 35443 at 2005 in Stirling; R.Japan via Moyabi 11.925 (Eng to Eu 2100-2155) 44334 at 2120 in E.Worthing; R.Havana Cuba 11.710 (Eng to Eu 2100-2200) 33333 at 2130 in Appleby.

Sometimes R.New Zealand's broadcast to Pacific areas in **9MHz (31m)** band has reached the UK. During exceptional conditions on the 8th, **T.Williams** (Truro) logged their 100kW transmission on 9.700 (Eng 0759-1300) as 44444 at 0930. The following morning it peaked 33333, but thereafter it was S1 to S3 at best. R.Australia was heard on 9.710 from Shepparton (Eng to Pacific 0730-1600), rated 42432 at 0839 in Bushey Heath;

Tropical Bands Chart

Freq MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	1844	B,D,E,G,M
2.325	ABC Tennant Creek	Australia	1847	B,D,E,G,M,N
2.340	Fujian 1, Fuzhou	China	2300	D
2.445	Jiangxi 1, Nanchang	China	2259	D
2.475	Zhejiang 1, Hangzhou	China	2307	D
2.485	ABC Katherine	Australia	1841	B,D,E,G,M
2.850	KCBS Pyongyang	N.Korea	2326	D
3.200	TWR Manzini	Swaziland	1823	E,G
3.210	Em.Nacional, Maputo	Mozambique	1741	G
3.220	CPBS 1, Beijing	China	1416	E,G
3.220	R.Kara, Lome	Togo	1759	B,G,N
3.223	AIR Simla	India	1530	A,E,G
3.230	R.Sol de Los Andes	Peru	0045	A
3.230	SABC Oranje Meyerton	S.Africa	2110	A,L,G
3.240	TWR Shona	Swaziland	1812	E,G
3.245	AIR Lucknow	India	1555	A,E,G,M
3.250	RRI Banjamarsin	Indonesia	1501	E,G
3.255	BBC via Maseru	Lesotho	2035	A,E,K,L,N
3.268	AIR Kohima	India	1607	G
3.270	SWABC 1, Namibia	S.W.Africa	2135	A,B,G,L,N
3.277	AIR Srinagar	India	1532	E,G
3.290	SWABC 2, Namibia	S.W.Africa	1746	A,B,E,G
3.295	AIR Ranchi?	India	1533	E,G
3.300	R.Cultural	Guatemala	0900	A,D,G,T
3.306	RRI Dili	Indonesia	1906	B,G
3.306	ZBC R-2?	Zimbabwe	2046	E,N,T
3.315	AIR Bhopal	India	1534	A,D,E,G
3.320	Pyongyang BC	N.Korea	1853	E,G
3.325	R.Liberal	Brazil	0730	A,D
3.325	FRCN Lagos	Nigeria	2127	B,G,L,N
3.335	CBS Taipei	Taiwan	1526	A,B,D,G,N
3.355	AIR Kurseong	India	1534	D,E,G
3.356	R.Botswana	Gabarone	1920	C,G,K,L,N
3.359	RTV Malagasy	Madagascar	1807	E,G
3.365	R.Rebelde, La Julia	Cuba	0210	A
3.365	GBC R-2	Ghana	2122	A,B,G,K,L,N,P
3.365	AIR Delhi	India	1627	E,G,M
3.370	R.Tezulutlan	Guatemala	0115	A
3.375	R.Nacional S.Gabriel	Brazil	2340	G,P
3.377	R.Nacional, Mulenvos	Angola	2122	A,N,E
3.380	NBC Blantyre	Malawi	1831	E,G,N,T
3.385	RFD Cayenne	Guiana	0120	A
3.395	BBC via Meyerton	S.Africa	1725	G
3.900	Hulunbei'er, Hailar	China	1457	G
3.905	RRI Banda Aceh	Indonesia	1606	G
3.915	BBC via Kranji	Singapore	2116	B,G,K,N,V
3.920	KCBS Shinuju	N.Korea	1608	G
3.925	NSB Tokyo	Japan	0820	D,G
3.940	PBS Hubei Wuhan	China	1456	E,G
3.945	AIR Gorakhpur	India	1535	E,G
3.945	Vatican Radio	Italy	1919	B
3.950	Qinghai PBS, Xining	China	1454	G
3.955	BBC via Skelton	England	2200	A,B,J,K,U,V
3.955	R.Budapest	Hungary	2200	G,M
3.960	Xinjiang PBS, Urumqi	China	1453	A,G
3.965	RFI Paris	France	2126	A,B,H,J,K,R,V
3.970	R.Buea	Cameroon	2210	M
3.970	RFE Biblis	Germany	1922	B,K
3.975	R.Korea via Skelton	England	2004	K
3.975	R.Budapest	Hungary	2020	K,M,S
3.980	Ch'ongjin	N.Korea	2058	R
3.980	VOA via Munich	Germany	1923	A,B,K
3.985	China R via SRI	Switzerland	2200	A,M,Q
3.985	SRI Beromunster	Switzerland	1924	B,H,I,K,M,Q,S
3.986	RRI Manokwari	Indonesia	1547	G
3.990	Xinjiang BS, Urumqi	China	1452	E,G
3.995	DW via Julich	Germany	1925	A,B,J
3.995	R.Budapest	Hungary	1938	G
3.995	DW via Meyerton	S.Africa	2030	V
4.000	Bofoussam	Cameroon	1941	G
4.003	RRI Padang	Indonesia	1420	E,G
4.035	Xizang PBS, Lhasa	Tibet	1466	A,G
4.081	Ulan Batar 1	Mongolia	1455	G
4.330	Xinjiang BS, Urumqi	China	1453	E,G
4.460	CPBS 1, Beijing	China	1452	E,G
4.500	Xinjiang BS, Urumqi	China	1631	D,E,G
4.735	Xinjiang, Urumqi	China	1458	A,D,E,G,J
4.750	Xizang BS, Lhasa	Tibet	1447	G
4.753	RRI Ujung, Padang	Indonesia	1545	G
4.755	R.Educ CP Grande	Brazil	0125	A,K
4.760	Yunnan PBS,Kunming	China	1513	E,R
4.760	AIR Port Blair	India	1606	E,G,L
4.760	ELWA Monrovia	Liberia	2130	E,G,L,N,R
4.765	R.Integracao	Brazil	0110	A
4.765	Brazzaville	P.Rep.Congo	1955	B,G,L,N
4.770	Centinela del Sur	Ecuador	0120	A
4.770	FRCN Kaduna	Nigeria	2016	B,F,G,K,L,N,R
4.775	AIR Guwahati	India	0045	A,D,E,G,L
4.775	TWR Manzini	Swaziland	1616	E
4.777	R.Gabon, Libreville	Gabon	2145	K,N
4.780	RTD	Djibouti	0305	A
4.783	RTM Bamako	Mali	2041	A,B,G,L,N
4.785	R.Tanzania	Tanzania	1931	B,K
4.790	Azad Kashmir R.	Pakistan	1501	A,E,G,K
4.790	R.Atlantida	Peru	2252	D,G
4.800	AIR Hyderabad	India	1536	E,G,L,N
4.800	LNBS Lesotho	Maseru	1934	B,E,G,K
4.805	R.Nac.Amazonas	Brazil	2252	A,G
4.810	R.San Martin Tara	Peru	0033	A,K
4.810	SABC Meyerton	S.Africa	1907	B,G
4.815	R.Difusora, Londrina	Brazil	0120	A
4.815	R.diff TV Burkina	Ouagadougou	2137	A,B,G,N
4.815	R.Pakistan Karachi	Pakistan	1446	G
4.820	La Voz Evangelica	Honduras	0135	A
4.820	AIR Calcutta	India	1614	A,G,M
4.820	Xizang, Lhasa	Tibet	1352	G
4.825	R.Cancao Nova	Brazil	2251	G
4.828	ZBC R-4	Zimbabwe	2135	E,L,T
4.830	R.Botswana, Gaborone	Botswana	2149	B,G,K,N
4.830	R.Tachira	Venezuela	2205	A,D,G,K,L,N
4.832	R.Reloj	Costa Rica	0920	D
4.835	R.Tezulutlan, Coban	Guatemala	0150	A
4.835	RTM Bamako	Mali	2015	A,B,G,H,K,L,M,N,V
4.840	Heilongjiang, Harbin	China	1445	G
4.840	AIR Bombay	India	1620	A,C,E,G,H,J,L,O,P
4.840	R.Valera, Trujillo	Venezuela	0140	A
4.845	R.Fides, La Paz	Bolivia	0125	A
4.845	RTM Kuala Lumpur	Malaysia	1544	E,G,L
4.845	DRTM Nouakchott	Mauritania	2015	A,B,D,G,H,K,L,N
4.850	R.Yaounde	Cameroon	1927	B,K
4.850	AIR Kohima	India	0055	A,C
4.850	Ulan Bator 1	Mongolia	1400	M
4.860	AIR Kingsway (Feeder)	India	1913	B,E,G,N,P
4.865	PBS Lanzhou	China	1443	A,B,C,E,G,H,J, K,L,M,V
4.865	L.V. del Cinaruco	Colombia	0130	A
4.870	R.Cotonou	Benin	2137	B,G,K,L,N
4.875	R.Roraima, Boa Vista	Brazil	0030	A
4.879	R.Bangladesh	Bangladesh	1442	A,E,G
4.885	R.Clube do Para	Brazil	0203	A,D,K
4.885	KBC East Sce Nairobi	Kenya	1900	B,G,K
4.890	R.Port Moresby	New Guinea	0901	D
4.895	Voz del Rio Arauca	Colombia	0120	A
4.895	Pakistan BC	Pakistan	1604	B,E,H
4.895	Hanoi 1	Vietnam	1440	G
4.900	V. of the Strait 2	China	1439	E,G
4.900	SLBC Colombo	Sri Lanka	1554	E,G,L
4.905	R.Nat.N'djamena	Chad	1900	B,G,K,L,N,P
4.910	AIR Jaipur	India	1354	E,G
4.910	R.Zambia, Lusaka	Zambia	1856	E,G,L,N
4.915	R.Anhanguera	Brazil	0105	A,D
4.915	PBS Guangxi, Nanning	China	1344	E
4.915	GBC-1, Accra	Ghana	2147	B,C,G,H,J,K,L,N,P,R
4.915	KBC Cent Sce Nairobi	Kenya	2107	N
4.915	R.Cora, Lima	Peru	0930	D
4.920	AIR Madras	India	1539	A,C,E,G,L,N
4.925	R.Difusora, Taubate	Brazil	2044	G
4.925	R.Nacional, Bata	Eq.Guinea	2117	N
4.927	RRI Jambi	Indonesia	2330	D,G
4.935	R.Difusora, Jatai	Brazil	0110	A
4.935	KBC Gen Sce Nairobi	Kenya	1957	G,L,N
4.935	R.Tropical, Tarapoto	Peru	0115	A
4.940	AIR Guwahati	India	1531	G
4.940	R.Abidjan	Ivory Coast	2215	V
4.945	R.Nac.Porto Velho	Brazil	0135	A
4.950	R.Nacional, Mulenvos	Angola	2012	B,E
4.955	R.Cultura, Campos	Brazil	0140	A
4.960	Mulenvos	Angola	2115	N
4.965	R.Alvorada	Brazil	2247	G
4.970	PBS Xinjiang	China	1537	D,E,G
4.970	RTM Kota Kinabalu	Malaysia	1538	G
4.970	R.Rumbos, Caracas	Venezuela	0103	A,J,K
4.975	Fujian 1, Fuzhou	China	1436	G
4.975	R.Uganda, Kampala	Uganda	2008	B,G,K,L,N,P
4.980	PBS Xinjiang, Urumqi	China	1524	A,E,G
4.980	Ecos del Torbes	Venezuela	2117	A,B,C,D,G,J,K, L,N,P,R
4.990	FRCN Lagos	Nigeria	2158	B,G,L,N
4.990	R.Ancash, Huaraz	Peru	0038	D,K
5.005	R.Nacional, Bata	Eq.Guinea	2242	B
5.005	RTM Sibu, Sarawak	Malaysia	1448	G
5.005	R.Nepal, Kathmandu	Nepal	1640	E,G,L
5.009	R.Madagasikara	Madagascar	1849	G
5.010	R.Garoua	Cameroon	0209	K
5.010	AIR Thiru'puram	India	0140	A,L
5.015	R.Brazil Tropical	Brazil	2245	G
5.020	PBS-Jiangxi Nanchang	China	1430	E,R
5.020	Ecos del Atrato	Colombia	1723	E
5.020	La V du Sahel, Niamey	Niger	2012	B,G,K,N
5.025	R.Parakou	Benin	2012	G,H,N
5.025	R.Rebelde, Habana	Cuba	0155	?A,L
5.025	R.Uganda, Kampala	Uganda	1849	B,G,K,L
5.030	BBS Thimpu	Bhutan	1430	L
5.030	AWR Latin America	Costa Rica	0845	T
5.035	R.Aparecida	Brazil	2244	G
5.035	R.Bangui	C.Africa	2047	B,G,K,L,N
5.040	PBS Fujian, Fuzhou	China	2330	R
5.045	R.Cultura do Para	Brazil	0039	D,K
5.047	R.Togo, Lome	Togo	2014	A,B,D,G,K,L,N,R
5.050	GFBC Nanning	China	1528	E,N
5.050	Voice of the Strait	China	1432	C,G
5.050	Voz de Yopal, Yopal	Colombia	0120	A
5.050	Em Jesus Gran Poder	Ecuador	0940	D
5.050	AIR Aizawl	India	1527	G
5.050	R.Tanzania	Tanzania	2000	D,G,K,L,N,R
5.055	R.Difusora, Caceres	Brazil	0140	A
5.055	RFO Cayenne (Matoury)	F.Guiana	0115	A,G,K
5.060	PBS Xinjiang, Urumqi	China	1417	B,E,G,L,M
5.061	RTV Kontum	Vietnam	1432	G
5.065	R.Candip, Bunia	Zaire	1945	G,L
5.075	Caracol Bogata	Colombia	0120	A,B,D,K,L,R
5.083	R.Mundo, Cusco	Peru	2243	G
5.125	Taiwan 1 Sce,Beijing	China	1530	G
5.240	Xizang, Lhasa	Tibet	1430	G
5.320	CPBS 1, Beijing	China	1529	G

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

DXers:

A Robert Connolly, Kilkeel.
B Geoff Crowley, Aberdeen.
C John Eaton, Woking.
D David Edwardson, Wallsend.
E P. Gordon Smith, Kingston, Moray.
F Bill Griffith, W.London.
G Gerry Haynes, Bushey Heath.
H Sheila Hughes, Morden.
I Rhoderick Illman, Oxted.
J Tony King, Swindon.
K Eddie McKeown, Newry.
L Denis Mulkeen, Kiltimagh, Eire.
M John O'Halloran, Harrogate.
N Fred Pallant, Storrington.
O John Parry, Northwich.
P Roy Patrick, Derby.
Q Clare Pinder, Appleby.
R Peter Pollard, Rugby.
S Chris Shorten, Norwich.
T John Slater, Scalloway.
U Tom Smyth, Co.Fermanagh.
V Bernard Tyers, Co.Waterford.

9.510 from Carnarvon (Eng to Asia 0900-1100) 35322 at 1016 in Newry; 9.615 from ? (Eng to S.Asia 1100-1428) 33323 at 1154 in Co.Waterford and 45554 at 1415 in Larnaca; 9.860 from Shepparton? (Eng to Pacific 0630-1200) 11111 at 1100 in Stockport; 9.770 from Carnarvon (Eng to Asia 1430-1630) a potent 44444 at 1512 in Woodhall Spa.

Many other broadcasters were heard here including R.Korea via Sackville 9.650 (Eng to N.Am 1130-1159) SIO444 at 1130 in Macclesfield; R.Norway Int, Oslo 9.590 (Norw [Eng Sun] to Eu 1300-1330) SIO434 at 1305 in Swindon; R.Pyongyang, Korea 9.977 (Eng to Eu, M.East, Africa 1500-1550) 33233 at 1520 in Norwich; SRI via Schwarzenburg? 9.885 (Eng to C/S.Asia 1500-1530) 54444 at 1532 in Penmaenmawr; R.Jordan via Al Karanah 9.560 (Eng to Eu 1500-1730) 54454 at 1710 by **Bill Griffith** in W.London; R.Nederlands via Flevo 9.860 (Eng to C/W.Africa 1830-2125) SIO444 at 1830 by **Francis Hearne** in N.Bristol; Voice of Turkey, Ankara 9.400 (Eng to Eu 2100-2150) 44344 at 2117 in E.Worthing; R.Nac del Paraguay 9.735 (Sp 0800-0400) 34443 at 2155 in Stirling; AWR Alajuela, Costa Rica 9.725 (Eng to C/S.Am 2300-0000) SIO433 at 2320 in Scalloway; HCJB Quito 9.745 (Eng to N.Am 0030-0430) 54545 at 0240 by **John Court** in Birmingham.

R.Australia has often reached the UK in the **7MHz (41m)** band. Their broadcast to S.Asia via Carnarvon 7.260 (Eng 1430-2100) was rated 23342 at 1432 in Woking; 45544 at 1503 in Wallsend; SIO333 at 1800 in Edinburgh; 33423 at 2040 in Rugby. While beaming to other areas WJCR via Millerstown 7.490 (Eng 24hrs) was 34333 at 1105 in Morden; China R.Int, Beijing 7.405 (Eng to W.USA 1400-1555) 32232 at 1405 in Norwich; KTBN via Salt Lake City 7.510 (Eng to N.Am 0000-1600) 24222 at 1509 in Woodhall Spa; Israel R, Jerusalem 7.465 (Eng to USA? 2230-2300) 35423 at 2250 in Middlesbrough; Voice of Turkey, Ankara 7.185 (Eng to M.East 2300-0000?) SIO323 at 2300 in Co.Fermanagh.

Some of the broadcasts to Europe originate from Monitor R.Int via WSHB 7.535 (Eng [Various Sat/Sun] to Eu ?-0955) 43333 at 0845 in Stalbridge; WEWN Birmingham 7.465 (Eng 0900-1200) SIO444 at 1100 in Harrogate; R.Nederlands via Nauen 7.130 (Eng 1130-1325?) 45434 at 1246 in Newry; AIR via Aligarh? 7.412 (Hi, Eng to Eu 1745-2230) 54544 at 1800 in W.London; R.Bulgaria, Sofia 7.305 (Eng to Eu 1900-2000) 54534 at 1910 in Ross-on-Wye; VOIRI Tehran 7.260 (Eng 1930-2027) 32332 at 1951 in Oxted; Israel R, Jerusalem 7.465 (Eng 2000-2030) 44444 at 2000 in Appleby; BBC via Skelton 7.325 (Eng 2000-2200) 44344 at 2008 in Co.Waterford; DW via Julich? 7.285 (Eng 2000-2050) 54544 at 2030 in Bridgwater; Monitor R.Int via WSHB 7.510 (Eng 2000-2355?) 55544 at 2148 in Bushey Heath, 44434 at 2315 in Penmaenmawr and SIO444 at 2345 in N.Bristol; R.Ukraine Int, Kiev 7.405 (Eng 2200-2300) 44544 at 2200 in Stirling; R.Bulgaria, Sofia 7.105 (Eng 2200-2300) SIO444 at 2250 in Rotherham.

There are many broadcasts to Europe in the **6MHz (49m)** band. Some come from HCJB Quito 6.205 (Eng 0700-0830), rated 55555 at 0800 in Norwich; R.Vlaanderen Int, Belgium 6.035 (Ger, Eng 0930-1030) SIO544 at 1010 in Swindon; RFI via Allouis 6.175 (Eng 1600-1700) SIO323 at 1615 in Elgin; R.Finland via Pori 6.120 (Eng 1930-2000) SIO444 at 1930 in N.Bristol; BBC via Limassol 6.180 (Eng 1700-2215) 54554 at 1955 by **Geoff Crowley** in Aberdeen.

(The Quarterly Equipment List is on Page 71.)

Andy Cadier, 28 Romney Avenue, Folkestone, Kent CT20 3QJ.

Off The Record

Monitoring the Pirates

Welcome to *SWM's* 'anorak' page, this quarter we are starting with readers' letters. **Melvyn Brown** writing from Ipswich says he collects pictures of pirate radio ships and is now seeking an up-to-date photograph of the *MV Communicator*. As reported in *SWM*, this former pirate radio ship is now being used to relay the Dutch station Holland FM on 1224kHz. A wide selection of pictures and posters of virtually every pirate radio ship that has ever existed are stocked by Offshore Echos, PO Box 1514, London W7 2LL.

Stephen Smith of Newtown Abbey, Northern Ireland writes, "I have to admit at being quite surprised how slick some of the pirate stations sound, in particular Laser Hot Hits and Britain Radio. For sheer entertainment value I have to nominate Ozone as they seem to suffer an equipment breakdown regularly and the DJ in a thick southern Irish accent gives a running commentary on the steps he is taking to repair the fault".

Details of a change of frequency used by WNKR has been sent in by **Toby Sigouin** of Edinburgh, Scotland. He had originally written to Brian Oddy's 'LM&S' page, but as West and North Kent Radio lacks a licence, (amongst many other things!) his report was promptly dispatched here. Yes Toby, the term "Radio outlaws from the south of England" is indeed a part of that station's identification. The reason they ask for a stamped addressed envelope and not an international reply coupon is that the German address is just a mail drop used by many stations. Letters are collected, a bit like a QSL bureau, and sent in bulk to the stations concerned. I cannot reproduce details of WNKR's address or new frequency, other than perhaps say they have moved up 75kHz to avoid Radio Korea.

Paul Alexander from Frinton-on-Sea has been in touch about Ireland's Radio 3 at Tullamore. In January I said this was an RTE station, apparently it's an independent, confusion arose as this is also the location of one of the Irish Republic's main medium wave transmitter sites.

FRS Goes DX

This is the name of a Dutch free radio magazine specialising in land based pirates, it is very well produced and written in English. My complimentary copy, (well you have to have some perks) is issue 131, which covers pirate radio news and a letters page. It also contains a detailed report with black and white pictures of the Holland FM/Communicator project and the results of a free radio questionnaire. The centre of the magazine contains a short wave pirate radio survey and a list of stations with frequency and programme details. If you have difficulty copying mailing addresses off the air, don't worry these are listed here too. A sample copy is £2.00 from Peter Verbruggen, PO Box 2727, 6049 ZG, Herten, Holland.

Fine Reduced

In January I reported on a case where reader Colin Clark had been stopped in his car by police and government radio investigators who prosecuted him for listening to, and attempting to listen to, an illegal pirate station. He was originally fined £1000 with £500 costs and his radio, a scanner, was forfeited. On appeal at the Crown Court the judges ruled that the offence was 'absolute', however they considered listening, and, intending to listen, were one and the same offence and quashed one of the two £500 fines. The magistrates court also seem to have exceeded their authority in ordering the confiscation of his radio receiver, this has now been returned to him. Mr Clark said he was pleased at the outcome of his appeal and the return of his radio, but it still left a number of unanswered questions.

Spy Stations

The *ENIGMA* newsletter recently arrived on my desk. For the uninitiated, this organisation deals with the reception of coded diplomatic radio transmissions. Also included are articles on world-wide electronic surveillance and long range radio interception facilities. Former military bases have been converted into underground communication centres, complete with 'antenna farms' guard dogs and floodlit fences. Enigma say it would be pointless to even try to decipher these messages, but they do try to discover the source of individual stations. Some have to be given names as they quite understandably have no official identification and operate from overseas. The address for *Engima* is c/o B.R.C. 31 Manor Row, Bradford, West Yorkshire BD1 4PS.

Private Short Wave Stations

The Czech Republic has licensed a private short wave station, Radio Metropolis, based in Prague, tests were heard at this QTH in December. They are believed to be using transmitters previously owned by Radio Czechoslovakia. Programmes are in Czech, Russian, German and English, and are directed to Europe, Middle East, Africa and North America. It seems strange that some countries are keen to have private s.w. stations while others are very much against the idea. Here in the UK a firm called Surrey Electronics tried unsuccessfully to get a licence for their popular short wave station 'Radiofax'. This small station was beamed to Britain from Ireland with media and electrical trade news. Radiofax had repeatedly applied to the Home Office for a licence to provide its unique service to British listeners from a site within the UK. Not only was this request denied, but pressure was placed on the Irish Government to bring an end to what they considered illegal broadcasts. Radiofax eventually closed on 30 September 1992 following a written complaint from the Irish Department of Communications.

Caroline Complaint

Radio Caroline had great success with their 28 day Restricted Service Licence on 1584kHz which ended at midnight on January 6. The final programmes included an hourly announcement on the options of the stations future. Ideally they would like a medium wave licence to allow broadcasts from their ship at their present location in Essex. They may well apply for the licence at present held by Frinton-on-Sea's Mellow 1557, when that is re-advertised. The other alternative aired was to return to international waters under the protection and licence of an overseas state. This would be legal under British law, however, the Radio Authority took this to mean they would return to radio piracy.

In actual fact, Radio Caroline are to approach the Department of National Heritage (The Government body responsible for broadcasting policy) in an attempt to secure the legal use of short wave frequencies for their service. At present, neither the Radio Authority or the Radiocommunications Agency are able to licence private s.w. broadcasting stations. If you would like to give your support to Radio Caroline returning to short wave you can write to Peter Moore their station manager at PO Box 963, London SW20 8XL.

76m Pirates

During the winter months many more stations seem to be making use of 3.9 - 4MHz. At one time, Dutch QSO pirates used to congregate in this area on Wednesday afternoons, now several of our regularly reported stations are making use of these frequencies during the late afternoons and evenings: It could well be worth a try. Live Wire Radio have recently been heard with a QSO in this band discussing the not so fashionable night attire worn by pirate radio operator/presenter Jock Wilson. Usually conversations are of a technical nature involving transmitter hardware or antennas.

Short Wave Pirates Chart

Station	Monitors
Radio Argus (MW London)	B,G
Jimmy International	A
Reflections	A,B,C,G
Moonlight	A,G
Laser Hot Hits	A,B,C,D,E
Transatlantic	A,B
Nord	A,B,G
Baltic	A
Jolly Roger	A,B,D,E,G
Lightning	A
Britain	A,B,D,E
Pamela	A,E
Ozone	A,B,D,E,G
Subterranean	A,B
Armadillo	A,G
Pandora	A
Brigitte	A,B
Heavy Dude	A
101 International	A
WNKR/Angel	A,B,C,D,E,F
Dublin	A,B,C,E,G
Holland Free Radio	B,D,G
Live Wire	B,D Pacman A,B
Titanic	B
Weekend Music Radio	D
East Coast Commercial	A,C,D,E,G

A Free Radio Monitoring, Halesowen, W. Midlands.
B Bob Marsh, Bexleyheath, Kent.
C Ian Turner, Deal, Kent.
D David Williams, Southampton, Hampshire.
E Stephen Smith, Co.Antrim, N. Ireland.
F Toby Sigouin, Edinburgh, Scotland.
G Ron Dryburgh, Ware, Hertfordshire.

TRADING POST

Fill in the order form **clearly** in **BLOCK CAPITALS** - up to a maximum of 30 words plus 12 words for your address, and send it together with your payment of £3.00, to Zoë Shortland, Trading Post, *Short Wave Magazine*, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.
If an order form is not provided due to space constraints, a form from a previous issue can be used as long as the cornerflash or Subscriber Number is attached as proof of purchase of the magazine.
Adverts appear on a first-come-first-served basis. If there is not enough space to feature a Trading Post ad in the issue you request it is automatically entered into the next one. All queries to Zoë Shortland on (01202) 659910.
We cannot accept advertisements from traders, or for equipment which is illegal to posses, use or which cannot be licensed in the UK.

For Sale

Akai multi-standard VCR record/play Pal Mesecam NTSC, model VS-X400 EGN. Ideal for multi satellite owners, in mint condition, boxed, remote, etc., £250. Tel/Fax: Staffs (01543) 275182.

Ancient broadcast receivers in varying condition, may interest collectors? I need the roof space! Ekco U319, Pye 1108, Hacker 'Sovereign', Buch VHF41, Stella ST 236A. Gordon Beckett, Bristol. Tel: (01225) 873005.

AOR AR8000 scanner, boxed with case, also *Scanners 3*, *UK Scanning Directory*, £325 the lot. Tel: Walsall (01922) 693191.

AOR2500 scanner, a.m., f.m., s.s.b., 100kHz to 1500MHz, 2200 memory channels, 15 search banks. RS232 computer control port. antenna, power supply, mobile mount, manual, v.g.c., £250 inc. P&P. Tel: Lancs (01995) 61612.

AR8000 hand-held scanner, boxed, as new, £325. May consider part exchange for base scanner. Tel: Barnsley (01226) 751715.

Attention Irish readers. Icom ICR7100 25-2000MHz, £799. Sony SW77 short wave receiver, £269. Realistic PRO2035 latest scanner, £299. AOR 1500EX, £289, all are boxed and in as new condition. Gary EI3EVB, Ireland. Tel: 051-71278, 087 513772.

Cirkit weather satellite receiver, built, cased and tested, 137.5, 137.62 crystals included, £56. Howes CTU18 a.t.u., £28. Epson Stylus 300 inkjet with sheet feeder, under warranty, £150. Tel: Derby (01332) 833661.

Communications receiver FRG7, £160. Tech. TE20D signal generator, 120kHz to 500MHz, £30. 144MHz converter, £15. Cossor scope, £20. Tel: London (01956) 409381 evenings.

D-450 DXTV converter, £35 o.n.o. Mains pre-amp, 40-860MHz, £7 o.n.o. Battery pre-amp 40-860MHz, £7 o.n.o. *SWM* July '91-December '92, £5 o.n.o. *RadCom* '91-'93 (15 issues), £6 o.n.o. Commodore C64 with lightrun, two joysticks and games, £50 o.n.o. All stuff p.w.o. Tim, Cheshire. Tel: (01260) 274775.

Drake 8E, excellent performance, £750. Trio 2000 with v.h.f., mint condition, £350. Sony 2001D, boxed, £160. Sony PRO80, v.g.c., £140. FRG8800 excellent radio, like new, £350. Trio JR-310 Ham band, narrow filter fitted, excellent RX, £150. Trio JR-60 RX, 15 valves, 2m f.m., m.w., 1.6-30MHz Ham band spread, Q multiplier, BFO, very sensitive, £80. Drake SW8, new, £400. RX PX possible. Tel: Middlesex 0181-813 9193.

Echostar SR5500 satellite receiver/antenna positioner, remote control, latest software, new power pack, unused since upgrade, boxed as new with handbook, fully tunable, 200 memories, £200 o.n.o. Tel: N. Wales (01352) 770182 after 7pm.

Flight disk, new ABC World Airways Guide for Microsoft Windows for 386 computer, onwards. Requires Windows 3.1, 4MB RAM world-wide aviation date in one package, £45 inc. P&P. M. Wynn, The Lodge, Court Place Gardens, Iffley, Oxford. Tel: (01865) 749376.

FRG7 manual, £90. Patrolman 50 m.f., v.h.f., u.h.f., £25. R217 AIR, boxed, mint, £35. Indoor Slim Jim, £15. Discone, £20. Joystick antenna with a.t.u., £25. Various bits. Tel: Doncaster (01302) 327915.

FRG7 receiver, £100. Good working order with manual and handbook. Tel: Oxon (01295) 670239 between 5 and 6pm please.

Global AT1000 a.t.u., new Feb '94, £45. Very little used. Tel: Warrington (01925) 825734.

Howes a.t.u., 500kHz to 30MHz, £35 new, o.n.o. Diamond D707 wide band active aerial, frequency 2-1.500MHz, 20dB gain, £60 o.n.o. Geoff, Grantham. Tel: (01476) 65688.

Icom IC-R7000 v.g.c., remote control, extension speaker, voice control, £585. Tel: Northampton (01327) 842285 anytime.

Icom IC-R7000 v.h.f./u.h.f. communications receiver, mint condition, boxed with handbook and service manual, £600. Tel: Surrey (01883) 343838.

Icom IC-R7100 receiver, v.g.c., £950. Tel: Tyneside 0191-252 8469.

Icom IC-R7100 super scanner, all-mode, u.s.b., l.s.b., a.m., a.m.w., w.f.m., n.f.m., f.m., 25MHz to 2GHz, 11 months old, boxed, manual and in mint condition, £850 plus postage. John, Fife. Tel: (01592) 203279 anytime.

Icom R1 hand-held scanner, 100kHz to 1.3GHz, no gaps, £220 o.n.o. Sky Scan discone 'table top' antenna v.h.f./u.h.f., £25. Tel: Redditch (01527) 529481.

ICS FAX1, decodes weather maps, NAVTEX, RTTY, direct to printer, no computer required, excellent condition, £95. PK88 h.f./v.h.f. TNC, as new, £100. Both items with leads and manual. Tel: Oxford (01865) 63000.

ICS FAX1, FAX/RTTY, NAVTEX decoder, required dot matrix printer, excellent quality maps, etc., includes p.s.u. and printer cable. Can be seen working, excellent condition with manual, £100. Alan, Essex. Tel: (01255) 503176 after 6pm.

JRC CMF-78 ECSS board for the NRD-535 receiver, boxed, £175. Tel: Penzance (01736) 788003 after 6pm.

Kenwood TS711E 144MHz base station transceiver, mint condition, HSWX2 dual band antenna, £575 o.n.o. Tel: Stroud (01453) 752946 or (0831) 237193.

Lowe 150, as new, needs no describing, key pad, NiCads, speaker, wooden case, mains unit, manuals, fantastic performer, £285. Gordon Smith, Kent. Tel: (01843) 291457.

Lowe HF125, manual, boxed, p.s.u., f.m. board fitted, antenna, amp fitted, A1 condition, first £225 secure this great receiver. Tel: Lancs (01942) 673964 anytime.

Lowe HF150 plus keypad, as new, bought October last year, £275. Also Mode Master software plus demodulator, cost £139 last October, bargain at £65. John Birkwood, Chichester. Tel: (01243) 533447 after 5pm daily.

Lowe HF150, mint, accessories, includes keypad, whip aerial, manual, p.s.u., bargain at, £270. Magnetic balun, £20. HF150 carry case, half price at, £20. Brian Day, N. Herts. Tel: (01475) 730537 answerphone.

Lowe HF225 synchronous a.m., boxed with manual. Lowe listener's guide, as new condition, very little used, £330. Carriage extra. Tel: Powys (01686) 412938.

May '94 Drake SW8, boxed with manual, £450. Sept '94 AOR 8000 scanner, boxed with manual, three antennas, car d/c, £325. Both as new, excellent performers, carriage free. Parcel force 48hr. Tel: Lincs (01754) 762359 anytime.

PC SWL, RTTY, SITOR, AMTOR, NAVTEX receiver, program includes manual, disk, demo tape and connections. Decode various data transmission, boxed, £35. Tel: Sussex (01323) 896715.

Realistic PRO2006, 400 channel scanner, boxed, new, with manual, £185. Microreader MkII, £95. ERA synoptic decoder, £75. Airband pre-amp, £25. Tel: Warwicks (01926) 54556.

Sangean ATS-803A excellent condition, boxed with manual and frequency lists. Also Netset PRO44, one year old, boxed with manual, £160 o.n.o. for both. Gerry, Glasgow. Tel: 0141-638 5786 anytime.

Sony ICF 200P, perfect condition, all accessories, £140. Yupiteru VT225, little used, boxed, all accessories, £150. Tel: Surrey (01372) 378307.

Sony ICF PRO80 hand-held multiband receiver with frequency converter, 150kHz to 223MHz, s.s.b., AIR, p.s.b., etc. PLL digital tuning, 40 memory presets scanning, £180 o.n.o. Only four months old. Peter Milford, Haven. Tel: (01646) 602170.

Sony ICF PRO80, l.w., m.w., s.w., v.h.f., f.m., 40 memories, manual, £150. Cash only. Graham Rankin, Wirral. Tel: 0151-334 5501.

Sony ICF-SW1E compact receiver with case, compact antenna and stereo earphones, excellent condition, £90. Tel: Kent (01322) 664726 evenings.

Sony SW55 short wave receiver, f.m., s.w., l.w., m.w., s.s.b., boxed with mains adapter, waveguide, earphones, wire aerial, brand new, never used, ideal everyday receiver, £220 o.n.o. Tel: Herts (01374) 245867 any day after 6pm.

Spectrum Plus3, DMP2000 printer, technical software RX4 decode programme, FAX, interface, log book software programme, manuals, excellent condition, hardly used, £100. Tel: Hatfield (01707) 267241.

Super Scaf digital audio filter, £40. Lowe UL1000 loop antenna, £25. SEM QRM eliminator, £50. CTU8 antenna tuner, factory built, £30. Wanted NRD 515 and NDH-518 memory unit in v.g.c. Tel: Lancs (01772) 704009 after 6pm.

Trio R2000 receiver, v.g.c., £260. BBC Master Compact Club monitor, manuals, circuits, proms, BBCB computer monitor, disc drives box, electronic odds, ring for more details, £120. Tel: Dorset (01305) 853192, ask for Derek.

Trio TS530S transceiver plus matching AT230 a.t.u. with original manuals, £450. Trio TR9130 144MHz all mode transceiver with manual, £300. Box with TR9130. Tel: Dudley (01384) 213945 evenings/weekends only.

VHF/UHF airband dipole aerial in good condition, works well, £15 includes P&P. Tel: Oxford (01865) 749374.

Yaesu FRG7 full cover short wave receiver with handbook, excellent condition, separate a.t.u. and Sony AN1 amplified antenna, full package, £190. Buyer collects or can deliver 100 miles radius Peterborough or meet half way anywhere. Eric Brumby, 82 Bluebell Avenue, Peterborough, Cambs PE1 3XH. Tel: (01733) 341821.

Yaesu FRG7 general coverage receiver, v.g.c., £100. No offers. Tel: Essex (01279) 445718.

Yaesu FRG7700, good condition, also a.t.u. for long wire, £240 the lot. May split, buyer collects or carriage extra. Tel: Somerset (01823) 288523, shift worker, so answerphone may cut in.

Yupiteru MVT7100, boxed with RH701 rubber antenna, soft case, extra NiCads and charger, books and accessories, bargain, £260 o.n.o. Also professionally built unit for off air recording of transmissions, £100. Tel: Sleaford (01529) 413118 after 6pm.

Yupiteru MVT8000 base/mobile scanner, 8-1300MHz, 200 channel, includes p.s.u., boxed with manual, £240 o.n.o. Tel: Llandudno (01492) 875433 after 6pm or weekends.

Yupiteru MVT7100, little used, new February '94. Boxed with car and mains chargers and manual. Includes discone aerial and frequency book, £270. Mr F. Lowe, Wigan. Tel: (01942) 728531.

Yupiteru MVT8000 scanner, little used, excellent condition, £235 or will exchange for Signal R535. Tel/FAX: Kent (01732) 363241.

Exchange

AOR3000A scanner, seven months old, hence mint condition, boxed with manual, offered in exchange for Kenwood R5000 RX or similar good quality receiver. Reason for exchange, got two scanners. Tel: Isle of Wight (01987) 756533.

Icom R7100 wanted in exchange for my 486 DX2-66 computer system with laser printer, may accept R7000 or AOR 3000A. Chris, Essex. Tel: (01376) 561670.

Pama CB transceiver, UK frequencies, boxed, accessories, 5 amp power supply, s.w.r. meter, base antenna, all two months old, offered in exchange for global a.t.u., or w.h.y.? (lost interest in 27MHz). Tel: Isle of Wight (01983) 756533.

Wanted

Anything made by the Marconi company before 1929, such as wireless sets, crystal sets, microphones, posters, books, magazines, signs, leaflets, headphones, horn speakers (sterling). Enrico Tedeschi, 54 Easthill Drive, Brighton BN41 2FD. Tel/Fax: (01273) 410749 or (0850) 104725.

Codar PRO40 pre-selector, also Codar a.t.u., any condition. Gerry, Staffs. Tel: (01283) 530036 anytime.

Datong converter UC1, any information on Timestep frequency meter (digital dial) DFC41 and Zetagi frequency converter C50. Tony, Worcester. Tel: (01905) 641759 before 2100 please.

Early digital read out valve sets, Racal, Collins, Eddystone, any type considered, good price paid. Also still looking for Japan radio NRD93, your price and KW Vespa is still needed. J. Collins, Staffs. Tel: (01538) 385735 evenings.

Eddystone EC10, EC10 MkII, 960, EB35, EB37, 888a, etc. Diecast speakers, 'S' meter, Edometer, any Clarke & Smith school radio, wartime civilian receiver for cash. Collection possible. £10 each offered for non workers. Peter Lepino, Surrey. Tel: (01374) 128170 anytime or FAX: (01372) 454381.

Eddystone S570 or 830 in reasonable working order. R. Brown, Dorset. Tel: (01963) 250815.

Ferrite rod aerials, must be half inch in diameter, no more or less, must be six inches long or more. Peter Tankard, Sheffield. Tel: 0114-234 3030 anytime.

ICS Synop III weather software, Martelec JVF1 or DF6JB Easyfax interface. Also Datong AD370 active antenna, all must be in good condition. Andrew G4XZL, Hants. Tel: (01705) 388488.

Information on 'bugging devices'. Frequencies, circuit diagrams, unwanted equipment, etc., also user reports on AOR 8000UK, what aerials work best? Also circuit diagrams for c.w., RTTY decoders, all information gratefully received. Richard Burt, 51 Gracemount Drive, Edinburgh EH16 6EZ.

Racal RA17 cabinet urgently required with Alan key if possible (Tor knobs), will collect almost anywhere! Any condition. Eric Brumby, 82 Bluebell Avenue, Peterborough, Cambs PE13 3XH. Tel: (01733) 341821.

SP100 extension speaker for Trio R1000 RX, perfect. Tom, Plymouth. Tel: (01752) 706337 anytime.

Telefunken tuner amplifier, Opus studio model 2650, l.w., m.w., s.w. and f.m. stereo and Philips short wave portable, model RL798, both in working condition or Philips mains radio model 561AT M.L.S., f.m. stereo. H. McCallion, No. 8 Strathard Close, Coleraine, Co Londonderry, N. Ireland BT51 3ES. Tel: (01265) 43793.

Television u.h.f. signal strength meter (portable type) for use in the field. Condition appearance not important, but must be OK. Reasonable price paid, also satellite meter. Tel: Derby (01332) 673463 anytime, ask for Gordon.

Wanted urgent for disabled pensioner, Trio 2m mobile TM201A for home use, fair price or swap near new PRO44 hand-held. Tel: Warwick (01295) 670749.

TRADING POST ORDER FORM

PLEASE WRITE IN BLOCK CAPITALS

PLEASE INSERT THIS ADVERTISEMENT IN THE NEXT AVAILABLE ISSUE OF *SHORT WAVE MAGAZINE*

A photocopy of this form is acceptable, but you must still send in the corner flash below as proof of purchase.

I enclose Cheque/P.O. for £.....(£3.00)

Made payable to *Short Wave Magazine*.

Name.....

Address.....

.....

.....

.....

Post Code.....

Credit Card Details

Access VISA MasterCard

Card Number

.....

Signature.....

Expiry date of card.....

FOR SALE/WANTED/EXCHANGE maximum 30 words

	(30)		

CONTACT DETAILS maximum 12 words

			(12)

SWM APRIL 95 TP

BOOK SERVICE

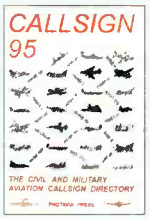
£50 PRIZE DRAW

For every book order received between April 1 1995 and April 30 1995, the name and address of the customer will be entered into our prize draw for this issue. On May 1 one name will be pulled from the sack. The lucky person will win a £50 note (the genuine article!). So why not order that book or books you've been thinking about, you could well be our lucky winner next time, don't forget it's much shorter odds than the National Lottery!

The books listed have been selected as being of special interest to our readers. They are supplied direct to your door. Many titles are overseas in origin.

TO ORDER:
PLEASE USE THE ORDER FORM ON PAGE 91 OR TELEPHONE THE CREDIT CARD HOTLINE ON (01202) 659930.

LISTENING GUIDES



CALLSIGN 95
The Civil & Military Aviation Callsign Directory
Intended for the aircraft and radio enthusiast to use as a stand alone reference, or as a partner to *Airwaves 94*. Over 5300 military and 3000 civil callsigns are covered in detail.
108 pages. **£7.95**

AIRWAVES 94
The Complete HF/VHF/UHF Aviation Frequency Directory
Much of the more obscure (especially military) information is made accessible in this volume. Not only are facilities/activities listed, giving their frequencies, but also there are reverse lists - when the frequency is known, the allocated user can be found. Airways sectors are listed so much more clearly than in the *Supplements*. The main transponder code groups are included. In fact, the book covers all the way from h.f. up to u.h.f.
88 pages. **£7.95**

AIR BAND RADIO HANDBOOK
5th Edition
David J. Smith
Air band radio listening enables you to listen-in on the conversations between aircraft and those on the ground who control them, and is an increasingly popular and fascinating hobby. A new chapter on military air band has been added. The author, an air traffic controller, explains more about this listening hobby.
190 pages. **£8.99**

THE COMPLETE SHORT WAVE LISTENER'S HANDBOOK 4th EDITION
Hank Bennett, Harry Helms & David Hardy
This book is a comprehensive guide to the basics of short wave listening. Everything you need to get started as an s.w.l. is explained in a clear and easily understood manner. Receivers, antennas, frequencies, propagation, Q-codes, etc. are all covered.
321 pages. **£17.95**

FERRELL'S CONFIDENTIAL FREQUENCY LIST 9th Edition
Compiled by Geoff Halligey
Spirally bound, this easy-to-use reference book covers 1.6 - 28MHz in great depth, all modes and utility services, with new reverse frequency listing showing every known frequency against each callsign, who's using what frequency and mode, what's that callsign?
544 pages. **£17.95**

SCANNER BUSTERS
D.C. Poole

This guide to the methodology of beating the electronic ban on Scanning, deals with the subject of scrambling and encryption systems. The author explains in simple terms how p.m.r. works, the new digital cellular radio telephone systems, spread spectrum, frequency hopping and emergency services communication. How to get more from your scanner and a list of frequencies to listen to are also covered. It is a great reference for both new scanner owners and veterans alike.
64 pages. **£4.95**

SCANNING SECRETS
Mark Francis
The miseries of monitoring explained. Advice on buying and operating your scanner. Where to listen and how to gather obscure frequencies. The myths and folk lore exposed. All the information need to unlock the potential of your scanner.
280 pages. **£16.95**

FLIGHT ROUTINGS 1994
Compiled by T.T. & S.J. Williams
This guide was produced with the sole aim of assisting airband listeners to quickly find details of a flight, once they have identified an aircraft's callsign. Identifies the flights of airlines, schedule, charter, cargo and mail, to and from the UK and Eire and overflights between Europe and America.
122 pages. **O/P**

GUIDE TO FAX RADIO STATIONS
14th Edition
Joerg Klingenfuss
The new edition of this super reference book covers the world's facsimile stations, their frequencies and methods of working. There is a section covering the equipment needed to receive FAX over the radio. To give you an idea of what is available there are many pages of off-air received FAX pictures. *392 pages.* **£20.00**

GUIDE TO UTILITY STATIONS
13th Edition
Joerg Klingenfuss
This book covers the complete short wave range from 3 to 30MHz together with the adjacent frequency bands from 0 to 150kHz and from 1.6 to 3MHz. It includes details on all types of utility stations including FAX and RTTY. There are 19549 entries in the frequency list and 3590 in the alphabetical callsign list plus press services and meteorological stations. Included are RTTY & FAX press and meteo schedules. There are 11800 changes since the 10th edition.
534 pages. **£30.00**

INTERNATIONAL RADIO STATIONS GUIDE
BP355
Peter Shore
As in 'Broadcast Round-up', his column in *PW*, Peter Shore has laid this book out in world areas, providing the listener with a reference work designed to guide around the ever-more complex radio bands. There are sections covering English language transmissions, programmes for DXers and s.w.l.s. Along with sections on European medium wave and UK f.m. stations.
266 pages. **£5.95**

INTERNATIONAL VHF FM GUIDE
7th Edition.
Julian Baldwin G3UHK & Kris Partridge G8AUU
70 pages. **£2.85**

POCKET GUIDE TO RTTY AND FAX STATIONS
Bill Laver
A handy reference book listing RTTY and FAX stations, together with modes and other essential information. The listing is in ascending frequency order, from 1.6 to 26.8MHz. *57 pages.* **£3.95**

RADIO LISTENERS' GUIDE 1995
Clive Woodyear
This is the third edition of this radio listener's guide. Simple-to-use maps and charts show the frequencies for radio stations in the UK. Organised so that the various station types are listed separately, the maps are useful for the travelling listener. Articles included in the guide discuss v.h.f. aerials, RDS, the Radio Authority and developments from Blaupunkt. *68 pages.* **£3.45**

SHORT WAVE INTERNATIONAL FREQUENCY GUIDE
This book contains a comprehensive frequency listing covering 400kHz - 30MHz and is packed with everything from the basics of short wave listening to explaining FAX and RTTY. In this updated version there are many new broadcast and utility stations listed. *188 pages.* **£12.95**

UK SCANNING DIRECTORY
4th Edition
This spiral bound book lists over 20000 UK spot frequencies from 25MHz to 1.6GHz. Articles on scanning in the UK.
335 pages. **£17.50**

VHF/UHF SCANNING FREQUENCY GUIDE
This book gives details of frequencies from 26MHz to 12GHz with no gaps and who uses what. Completely revised and enlarged (February 1993), there are chapters on equipment requirements as well as antennas, the aeronautical bands, and the legal aspects of listening using a scanner.
156 pages. **O/P**

WORLD RADIO TV HANDBOOK 1995
Country-by-country listing of l.w., m.w. & s.w. broadcast and TV stations. Receiver test reports, English language broadcasts. The s.w.l.'s 'bible'.
£15.95

SATELLITES

NEWNES GUIDE TO SATELLITE TV
Derek Stephenson
This book, the 3rd edition, is a hard bound volume, printed on high quality paper. The author is a satellite repair and installation engineer and the book covers all information needed by the installation engineer, the hobbyist and the service engineer to understand the theoretical and practical aspects of satellite reception with dish installation and how to trouble-shoot when picture quality is not up to anticipated reception. Mathematics has been kept to a minimum.
371 pages. **£18.95**

SATELLITE BOOK - A Complete Guide to Satellite TV Theory and Practice
John Breeds
This book deals almost exclusively with television broadcast satellites and is a comprehensive collection of chapters on topics, each written by a expert in that field. It appears to be aimed at the professional satellite system installer, for whom it is invaluable, but it will be appreciated by a much wider audience - anyone interested in satellite technology.
280 pages. **£32.00**

SATELLITE EXPERIMENTER'S HANDBOOK
2nd Edition
Martin Davidoff K2UBC
The book is divided into four main sections - History, Getting Started, Technical Topics and Appendices. It provides information on spacecraft built by, and for, radio amateurs. In addition, it discusses weather, TV-broadcast and other satellites of interest to amateurs.
313 pages. **£14.50**

SATELLITE TELEVISION
A layman's guide
Peter Pearson
Pictures from space, that's what satellite television is all about. Orbiting satellites, 35000km high, receive TV signals from stations on the earth and re-transmit them back again. This book explains all you need to know to set up your own satellite TV terminal at home, dish and accessories, cable and tuner.
73 pages. **£1.00**

SATELLITE TELEVISION INSTALLATION GUIDE
5th Edition
John Breeds
A practical guide to satellite television. Detailed guide-lines on installing and aligning dishes based on practical experience.
76 pages. **£15.00**

WEATHER SATELLITE HANDBOOK
5th Edition
Dr Ralph E. Taggart WB8DQT
This book explains all about weather satellites, how they work and how you can receive and decode their signals to provide the fascinating pictures of the world's weather. Plenty of circuit diagrams and satellite predicting programs.
192 pages. **£14.50**

WRTH SATELLITE BROADCASTING GUIDE
1994 Edition. Bart Kuperus
This brand new publication, written by one of the experts from the respected *World Radio TV Handbook*, will be a great help to everyone interested in the world of satellite radio and television. Featuring over 300 pictures and graphics. All the information you need to know about installing your own satellite system.
366 pages. **£15.95**

AMATEUR RADIO

ALL ABOUT VHF AMATEUR RADIO
W. I. Orr W6SAI
Written in non-technical language, this book provides information covering important aspects of v.h.f. radio and tells you where you can find additional data. If you have a scanner, you'll find a lot of interesting signals in the huge span of frequencies covered, 100-300MHz & 50, 420, 902 & 1250MHz bands. *163 pages.* **£9.50**

AMATEUR RADIO CALLBOOK & INFORMATION DIRECTORY (RSGB)
Latest Edition
The first 124 pages provide a useful information directory with details of specialised clubs, county lists, repeater details, band plans and reference material. Then follows the callbook itself with over 60 000 callsigns including EI and Novice stations. A new section has been added towards the back of the book giving lists of surnames and inititals of listed radio amteurs followed by callsigns and the same under post-code areas.
508 pages. **O/P**

AMATEUR RADIO FOR BEGINNERS RSGB
Victor Brand G3JNB
An ideal book for the absolute beginner to the amateur radio hobby. Well illustrated and an interesting read.
65 Pages. **£3.50**

AMATEUR RADIO LOGBOOK
Published by RSGB
This standard spirally bound amateur radio log book has 100 pages and is marked out with the format required in the UK. There are columns for date, time (UTC), frequency, power (in dBW), station worked/called, reports, QSL information and remarks. **£2.99**

AMATEUR RADIO TECHNIQUES RSGB
Pat Hawker G3VA
Anyone who enjoys Pat Hawker's 'Technical Topics' in *Radio Communications* will enjoy this book. An amateur radio manual itself, this paperback book, the 7th edition, can only be bettered by a new edition. A truly excellent reference source with a practical bias.
368 pages. **£9.50**

ANTENNAS AND TECHNIQUES FOR LOW-BAND DXING (ARRL)
John Devoldere ON4UN
This unusual book will be of particular interest to 1.8, 3.5 and 7MHz operators as it's packed with information on antennas and operating tips for 'Top Band to Forty' fans. There are chapters on low band propagation, operating techniques, equipment and for the computer minded there's a chapter on newly-available low band software.
393 pages. **£14.50**

ARRL HANDBOOK FOR RADIO AMATEURS 1995
This is the 72nd edition of this handbook and contains the best information from previous issues. New for this edition is some information on feedback-loop design for power supplies, a new gel-cell charger project, updates on antenna systems and new coverage of baluns, propagation programs are compared and colour SSTV and telephone FAX machines are also covered. Finally there's a new section on 'for the workbench' with new projects for the reader to build.
1214 pages. **£19.95**

ARRL OPERATING MANUAL
Another very useful ARRL book. Although written for the American amateur, this book will also be of use and interest to the UK amateur. Topics covered range from short wave listening through operating awards to repeaters, operating and satellites.
684 pages. **£12.95**

ARRL SATELLITE ANTHOLOGY
The best from the Amateur Satellite News column and articles out of 31 issues of *QST* have been gathered together in this book. The latest information on OSCARs 9 through 13 as well as the RS satellites is included. Operation on Phase 3 satellites (OSCAR 10 and 13) is covered in detail.
97 pages. **£5.95**

ARRL UHF/MICROWAVE EXPERIMENTER'S MANUAL
Various Authors


A truly excellent manual for the keen microwave enthusiast and for the budding 'microwaver'. With contributions from over 20 specialist authors. Chapters covering techniques, theory, projects, methods and mathematics.
446 pages. **£14.50**

THE BRIGHT SPARKS OF WIRELESS RSGB
G. R. Jessop G6JP
This hardback book is well illustrated with some excellent photographs. It pays tribute to and takes a good look at the personalities behind the early days of amateur radio and the equipment they used. A good read. *90 pages.* **£12.50**

COMPLETE DX'ER
Bob Locher
This book covers equipment and operating techniques for the DX chaser, from beginner to advanced. Every significant aspect of DXing is covered, from learning how to really listen, how to snatch the rare ones out of the pile-ups and how to secure that elusive QSL card. *204 pages.* **£7.95**

HINTS AND KINKS FOR THE RADIO AMATEUR
Edited by Charles L. Hutchinson and David Newkirk
A collection of practical ideas gleaned from the pages of *QST* magazine. Plenty of projects to build, hints and tips on interference, c.w. and operating and snippets of information from amateurs who've tried and tested the idea.
129 pages. **£4.95**

HOW TO PASS THE RADIO AMATEURS' EXAMINATION (RSGB)
Clive Smith G4FZH and George Benbow G3HB
The background to multiple choice exams and how to study for them with sample RAE paper for practice plus maths revision and how to study for the exam. The majority of this book is given to sample examination papers so that candidates can familiarise themselves with the examination and assess their ability.
88 pages. **£7.99**

INTRODUCTION TO AMATEUR COMMUNICATIONS SATELLITES
***BP290*. A. Pickard**
This book describes several currently available systems, their connection to an appropriate computer and how they can be operated with suitable software. The results of decoding signals containing such information as telemetry data and weather pictures are demonstrated. *102 pages.* **£3.95**

INTRODUCTION TO AMATEUR RADIO *BP257*
I. D. Poole
This book gives the newcomer a comprehensive and easy to understand guide through amateur radio. Topics include operating procedures, jargon, propagation and setting up a station. *150 pages.* **£3.50**

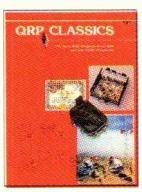
INTRODUCTION TO RADIO WAVE PROPAGATION *BP293*
J.G. Lee
How does the sun and sunspots affect the propagation of the radio waves which are the basis of our hobby? They affect the ionosphere, but differing frequencies are treated differently. Find out how to use charts to predict frequencies that will be the most profitable. What effect will noise have on the signal? Find out with this book.
116 pages. **£3.95**

INTRODUCTION TO VHF/UHF FOR RADIO AMATEURS *BP281*
I.D. Poole
An excellent book to go with the new Novice or full callsign. Nine chapters and an appendix deal with all aspects and frequencies from 50 to 1300MHz. Topics include propagation, descriptions of the bands, antennas, receivers, transmitters and a special chapter on scanners.
102 pages. **£3.50**

LOW PROFILE AMATEUR RADIO - OPERATING A HAM STATION FROM ALMOST ANYWHERE
Jim Kearman KR1S
This book delves into to the techniques of being a 'hidden Ham'. There are chapters on specialised equipment, operating techniques and antennas to name but a few. If you have a fascination for spy type radio equipment or like the idea of having a complete h.f. or v.h.f. rig built in a suitcase, then this little American book is for you. *124 pages.* **£5.95**

MICROWAVE HANDBOOK RSGB
Volumes 1, 2 and 3
Edited By M. W. Dixon G3PFR
Approximately 350 pages (each volume). Vol. 1 costs **£9.99**, Vol. 2 and 3 cost **£14.99** each.

PRACTICAL GUIDE TO PACKET OPERATION IN THE UK
Mike Mansfield G6AWD
Introduces the concept of packet radio to the beginner. Problem areas are discussed and suggestions made for solutions to minimise them. Deals with the technical aspects of packet taking the reader through setting up and provides a comprehensive guide to essential reference material. *220 pages.* **£9.95**

QRP CLASSICS
Edited by Bob Schetgen


Operating QRP is fun. The equipment is generally simple and easy to build, but often performs like more sophisticated commercial equipment. Some QRP Field Day stations operate a full 27 hours on a car battery - it's the perfect equipment for emergency communication when the power fails. Extracts from *QST* and the *ARRL Handbook*.
274 pages. **£9.95**

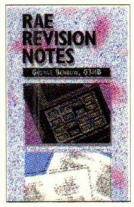
RADIO AMATEUR CALLBOOK INTERNATIONAL LISTINGS 1995
73rd Edition
The only publication listing licensed radio amateurs throughout the world. Also includes DXCC Countries list, standard time chart, beacon lists and much more. *Over 1400 pages.* **£20.95**

RADIO AMATEUR CALLBOOK NORTH AMERICAN LISTINGS 1995
73rd Edition
Listings of US amateurs (including Hawaii). Also contains standard time chart, census of amateur licences of the world, world-wide QSL bureau, etc. *Over 1400 pages.* **£20.95**

THE RADIO AMATEUR'S GUIDE TO EMC RSGB
Robin Page-Jones G3JWI
This paperback book provides essential information and reading for anyone who has an EMC (interference) problem. With the help of the well-illustrated text and techniques, much of the mystery from the troublesome world of electromagnetic compatibility is removed.
117 pages. **£7.99**

RADIO COMMUNICATION HANDBODK (RSGB)
6th Edition
Dick Biddulph G8PDS
This long awaited new edition has been extensively up-dated and is full of diagrams and photographs. This book is a complete handbook/reference work and project book all rolled into one. The final innovation is that the necessary p.c.b. templates for the featured projects are provided at the end of the book making them much easier to work from when making your own p.c.b.s. *750 pages.* **£20.00.**

RAE MANUAL RSGB
G.L.Benbow G3HB
The latest edition of the standard aid to studying for the Radio Amateurs' Examination. Updated to cover the latest revisions to the syllabus. Takes the candidate step-by-step through the course.
127 pages. **£7.99**

RAE REVISION NOTES
George Benbow G3HB


If you're studying for the Radio Amateur's Examination, this book could be useful. It's a summary of the salient points of the *Radio Amateurs' Examination Manual*, the standard textbook for the exam. It's A5 size and therefore can be carried with you wherever you go. Easy-to-read, it's divided into 13 chapters with topics like receivers, power supplies, measurements, operating procedures, licence conditions and a summary of the formulae all dealt with. *92 pages.* **£4.99**

REVISION QUESTIONS FOR The Novice RAE RSGB
Esde Tyler G0AEC
In effect Esde Tyler's book could be considered as being a training manual for the NRAE. Answers are supplied and the book provides a useful reference source. *60 pages.* **£5.00**

RECEIVING STATION LOG BOOK
Published by RSGB
£3.50

SPACE RADIO HANDBOOK RSGB
John Branegan GM4IHJ
236 pages. **£12.50**

THE NOVICE LICENCE STUDENT'S NOTEBOOK
John Case GW4HWR
This is the recommended course book for anyone taking the Novice Licence. Covering all aspects of amateur radio and electronics it would be useful to anyone starting out in amateur radio. Every left hand page is for your own notes of explanation.
124 pages. **£5.99**

TRAINING FOR THE NOVICE LICENCE RSGB
John Case GW4HWR
Aimed at the Novice licence instructor this manual provides the syllabus and an excellent framework textbook to help novice, instructor and beginner alike. An excellent basic reference work. *101 pages.* **£6.50**

VHF/UHF DX BOOK
Edited Ian White G3SEK
An all round source of inspiration for the v.h.f./u.h.f. enthusiast. Written by acknowledged experts this book covers just about everything you need to know about the technicalities of v.h.f./u.h.f. operating. *270 pages.* **£18.00**

VHF UHF MANUAL RSGB
G. R. Jessop G6JP
The 4th edition of this well known book is in paperback form. Packed with information for the world of radio above 30MHz. It covers everything from v.h.f./u.h.f. radio history and theory and propagation to projects and techniques. An excellent reference source.
Approximately 1000 pages. **£10.50**

W1FB's DESIGN NOTEBOOK
Doug DeMAW W1FB
This book is aimed at the non-technical amateur who wants to build simple projects and obtain a basic understanding of amateur electronics. Your workshop does not need to be equipped like an engineering lab to be successful as an experimenter. Don't let a lack of test equipment keep you from enjoying the thrills of experimentation. *195 pages.* **£8.50**

W1FB'S HELP FOR NEW HAMS
Doug DeMaw W1FB
This book covers everything from getting acquainted with new equipment to constructing antennas, station layout, interference and operating problems to on-the-air conduct and procedures. *155 pages.* **£8.95**

W1FB's QRP NOTEBOOK
2nd Edition. Doug De Maw W1FB
The new improved and updated 2nd edition of this book, covers the introduction to QRP, construction methods, receivers and transmitters for QRP. This workshop-notebook style publication, which is packed with new designs for the keen QRP operator, also covers techniques, accessories and has a small technical reference section.
175 pages. **£7.95**

WORLD AT THEIR FINGERTIPS RSGB
John Clarricoats G6CL *307 pages.* **£6.00**

YOUR GATEWAY TO PACKET RADIO
Stan Horzepa WA1LOU
What is packet radio good for and what uses does it have for the 'average' amateur? What are protocols? where, why, when? Lots of the most asked questions are answered in this useful book. It included details of networking and space communications using packet. *278 pages.* **£8.95**

YOUR PACKET COMPANION
Steve Ford WB8IMY
This American book goes to considerable lengths to explain in simple terms how the radio amateur can get going on packet, how it works and what the various systems are. There are chapters dealing with assembling a packet station, sending and receiving packet mail and exploring advanced networking systems. *Your Packet Companion* goes a long way to explain some of the mysteries of packet radio. *170 pages.* **£5.95**

DATA REFERENCE

NEWNES AUDIO & HI-FI ENGINEER'S POCKET BOOK
Vivian Capel
190 pages. Hardback. **£10.95**

NEWNES COMPUTER ENGINEER'S POCKET BOOK
255 pages. Hardback. **£12.95**

POWER SELECTOR GUIDE *BP235*
J. C. J. Van de Ven
160 pages. **£4.95**

NEWNES ELECTRONICS ENGINEER'S POCKET BOOK
1st Edition
Keith Brindley
This fact-filled pocket book will prove useful for any electronics engineer. Its comprehensive coverage includes literally everything from electronic physics to abbreviations, information on integrated circuits, applications, component data, circuits and systems. In effect this book provides a very useful portable electronics reference source. *305 pages.* **£12.95**

A REFERENCE GUIDE TO BASIC ELECTRONICS TERMS BP286
F. A. Wilson
Covering everything from Amplitude Modulation to Zener Diodes, this excellent guide is a manual, dictionary and revision book all rolled into one. With concise explanations, clear diagrams and easy to follow examples, this is an essential addition to the library of anyone contemplating taking the RAE. *474 pages.* **£5.95**

A REFERENCE GUIDE TO PRACTICAL ELECTRONICS TERMS BP287
F. A. Wilson
This is a well written clearly illustrated reference guide which, when used on its own, is perhaps of more use to those interested in the contructional side of amateur radio. However, it is of particular benefit to those taking the RAE especially if used in conjunction with *A Reference Guide to Basic Electronics Terms. 442 pages.* **£5.95**

INTERNATIONAL TRANSISTOR EQUIVALENTS GUIDE BP85
Adrian Michaels
300 pages. **£3.95**

THEORY

CIRCUIT SOURCE BOOK 1 - BP321
R.A. Penfold
Written to help you create and experiment with your own electronic designs by combining and using the various standard 'building block' circuits provided. Deals with filters, amplifiers, voltage comparitors, etc.
182 pages. **£4.95**

CIRCUIT SOURCE BOOK 2 - BP322
R.A. Penfold
Complimentary to *Circuit Source Book 1*, helps you create and experiment with your own electronic designs by combining and using the various standard 'building block' circuits provided. Covers signal generation, power supplies and digital electronics, etc.
214 pages. **£4.95**

ARRL ELECTRONICS DATA BOOK
Doug DeMaw W1FB
Back by popular demand, completely revised and expanded, this is a handy reference book for the r.f. designer, technician, amateur and experimenter. Topics include components and materials, inductors and transformers, networks & filters, digital basics and antennas and transmission lines. *260 pages.* **£8.95**

AUDIO
Elements of Electronics - Book 6 *BP111*
F. A. Wilson
This book studies sound and hearing, and examines the operation of microphones, loudspeakers, amplifiers, oscillators, and both disk and magnetic recording. Intended to give the reader a good understanding of the subject without getting involved in the more complicated theory and mathematics.
308 pages. **£3.95**

BEGINNERS GUIDE TO MODERN ELECTRONIC COMPONENTS BP285. R.A. Penfold
This book covers a wide range of modern components. The basic functions of the components are described, but this is not a book on electronic theory and does not assume the reader has an in-depth knowledge of electronics. It is concerned with practicalities such as colour codes, deciphering code numbers and suitability.
166 pages. **£3.95**

EVERYDAY ELECTRONICS DATA BOOK
Mike Tooley BA. *250 pages.* **£8.95**

FILTER HANDBOOK
A Practical Design Guide
Stefan Niewiadomski
A practical book, describing the design process as applied to filters of all types. Includes practical examples and BASIC programs. Topics include passive and active filters, worked examples of filter design, switched capacitor and switched resistor filters and includes a comprehensive catalogue of pre-calculated tables. *195 pages.* **£30.00**

GUIDE TO CREATIVE CIRCUIT DESIGN
Robert Grossblatt
A book that takes you through all stages of design and building of (mainly) digital circuits, though many of the priciples apply to all forms of design and building. One nugget from the book, 'if you can't replace it - don't use it'.
235 pages. **£17.95**

FURTHER PRACTICAL ELECTRONICS CALCULATIONS & FORMULAE BP144
F. A. Wilson. *450 pages.* **£4.95**

AN INTRODUCTION TO THE ELECTROMAGNETIC WAVE BP315
F. A. Wilson
This little book deals effectively with a difficult abstract subject - the invisible electromagnetic wave. Aimed at the beginner, the book with its basic approach to electromagnetics, antennas, waves, propagation and constraints is a good starting point, complete very simple but clear diagrams and the minimum of mathematics.
122 pages. **£4.95.**

NEWNES PRACTICAL RF HANDBOOK
Ian Hickman
This book provides an easy-to-read introduction to modern r.f. circuit design. It's aimed at those learning to design r.f. circuitry and users of r.f. equipment such as signal generators and sweepers, spectrum and network analysers.
320 pages. **£16.95**

THE ARRL SPREAD SPECTRUM SOURCEBOOK
Many readers thought an article about spread spectrum communications in the April 1993 *PW* a spoof, but this book shows the reality of the tecnique. The ten chapters contain descriptions of the basic theory, the designs, and the techniques involved, and there are basic transceiver building blocks for your experimentation. *360+ pages.* **£14.50.**

PRACTICAL ELECTRONICS CALCULATIONS AND FORMULAE
BP53. F. A. Wilson
Written as a workshop manual for the electronics enthusiast, there is a strong practical bias and higher mathematics have been avoided where possible.
249 pages. **£3.95**

REFLECTIONS
Transmission Lines & Antennas
M. Walter Maxwell W2DU
This will help dispel the half-truths and outright myths that many people believe are true about transmission lines, standing waves, antenna matching, reflected power and antenna tuners.
323 pages. **£14.50**

SOLID STATE DESIGN FOR THE RADIO AMATEUR
Les Hayward W7ZOI &
Doug DeMaw W1FB
Back in print by popular demand! A revised and corrected edition of this useful reference book covering all aspects of solid-state design. Topics include transmitter design, power amplifiers and matching networks, receiver design, test equipment and portable gear.
256 pages. **£10.95**

TRANSMISSION LINE TRANSFORMERS
Jerry Sevick W2FMI
This is the second edition of this book, which covers a most intriguing and confusing area of the hobby. It should enable anyone with a modicum of skill to make a balun, etc. Topics include analysis, characterisation, transformer parameters, baluns, multimatch transformers and simple test equipment.
270 pages. **£13.50**

CONSTRUCTION

CIRCUIT SOURCE BOOK 2 BP322
R. A. Penfold *214 pages.* **£4.95**

COIL DESIGN AND CONTRUCTION MANUAL *BP160*
B.B. Babani *106 pages.* **£2.50**

G-QRP CLUB CIRCUIT HANDBOOK
Edited by Rev. G. Dobbs G3RJV
This paperback book has been compiled from circuits published in the G-QRP Club journal *Sprat* from the years 1974 to 1982. Essentially it's a collection of circuits and projects covering everything from receivers, transmitters, antennas and accessories together with sed QRP test equipment. This book is aimed at the keen constructor and provides all the information required to build the host of projects described.
96 pages. **£8.50**

HOW TO DESIGN AND MAKE YOUR OWN PCBs *BP121* R. A. Penfold
The purpose of this book is to familiarise the reader with both simple and more sophisticated methods of producing p.c.b.s. The emphasis of the book is very much on the practical aspects of p.c.b. design and construction. *66 pages.* **£2.50**

MORE ADVANCED POWER SUPPLY PROJECTS *BP192* R. A. Penfold
The practical and theoretical aspects of the circuits are covered in some detail. Topics include switched mode power supplies, precision regulators, dual tracking regulators and computer controlled power supplies, etc. *92 pages.* **£2.95**

PROJECTS FOR RADIO AMATEURS AND SWLS BP304 R. A. Penfold
This small book covers the construction and use of radio frequency and intermediate frequency projects, and audio frequency projects. Under the first heading ideas include a crystal calibrator, an antenna tuning unit, a wave trap, a b.f.o. and other useful projects. On the audio side projects include a bandpass filter, a by-pass switch, a c.w./RTTY decoder and many other practical ideas and suggestions for the home constructor.
92 pages. **£3.95.**

POWER SUPPLY PROJECTS BP76
R. A. Penfold
This book gives a number of power supply designs including simple unstabilised types, fixed voltage regulated types and variable voltage stabilised designs.
89 pages. **£2.50**

SHORT WAVE SUPERHET RECEIVER CONSTRUCTION *BP276*
R.A. Penfold
A general purpose receiver to build, from antenna to audio, described in understandable English. *80 pages.* **£2.95**

TEST EQUIPMENT CONSTRUCTION
***BP248.* R.A.Penfold**
Describes, in detail, how to construct some simple and inexpensive, but extremely useful, pieces of test equipment. Stripboard layouts are provided for all designs, together with wiring diagrams where appropriate, plus notes on their construction and use. *104 pages.* **£2.95**

50 (FET) FIELD EFFECT TRANSISTOR PROJECTS *BP39*
F.G.Rayer
50 circuits for the s.w.l., radio amateur, experimenter or audio enthusiast using f.e.t.s. Projects include r.f. amplifiers and converters, test equipment and receiver aids, tuners, receivers, mixers and tone controls.
104 pages. **£2.95**

COMPUTING

BUILD YOUR OWN IBM COMPATIBLE (SECOND EDITION)
Aubrey Pilgim
If you're considering building, or upgrading an IBM compatible computer, this book could prove ideal. Chapters deal with the Motherboards, video cards, input/output boards and floppy and hard disks. Fancy adding an image scanner? This and much more information may be found here. *244 pages.* **£17.95**

INTERFACING PCs AND COMPATIBLES BP272
R. A. Penfold.
86 pages. **£3.95**

ELECTRONIC PROJECTS FOR YOUR PC BP320
R. A. Penfold.
102 pages. **£3.95**

INTRODUCTION TO COMPUTER COMMUNICATIONS (AN) *BP177*
R. A. Penfold
Details of various types of modem and their applications, plus how to interconnect computers, modems and the telephone system. Also networking systems and RTTY.
72 pages. **£2.95**

NEWNES AMATEUR RADIO COMPUTING HAND BOOK
Joe Pritchard G1UQW
Shows how radio amateurs and listeners can 'listen' to signals by reading text on a computer screen. This book also covers the application of computers to radio 'housekeeping' such as log-keeping, QSL cards, satellite predictions and antenna design as well as showing how to control a radio with a computer. *363 pages.* **O/P**

PCs MADE EASY. Second Edition
James L. Turley
A friendly, comprehensive introduction to every personal computer - including Macs! This book is packed with valuable tips on every aspect of computer technology available today and will help you to get comfortable with your computer - fast. *438 pages.* **£14.95**

UPGRADE OR REPAIR YOUR PC
Aubrey Pilgrim
Aimed at the owners of the IBM compatible computer, this book provides a very straightforward to read guide on upgrading. The author has adopted a friendly and informative style and the there are many excellent illustrations. Typically American in approach and style, the book provides much information and an excellent read. *245 pages.* **£17.95**

RADIO

THE WORLDWIDE AERONAUTICAL COMMUNICATIONS FREQUENCY DIRECTORY 2nd Edition
Robert E. Evans
This book covers aeronautical radio communications, voice and digital, within the range of h.f. and v.h.f./u.h.f. frequency bands. Commercial, military and para-military operations are included. Divided into logical sections, it provides useful infomation and frequencies on almost anything and everything airband.
260 pages. **£19.95**

UNDERSTANDING ACARS 2nd Edition
Aircraft Communications Addressing and Reporting System
Ed Flynn


Here is the information you need to understand and decode the Aircraft Communications Addressing and Reporting System, otherwise known as ACARS. Deals with the equipment needed as well as message format and type.
80 pages. **£9.95**

AIR & METEO CODE MANUAL 14th Edition.
Joerg Klingenfuss
Detailed descriptions of the World Meteorological Organisation Global Telecommunication System operating FAX and RTTY meteo stations, and its message format with decoding examples. Also detailed description of the Aeronautical Fixed Telecommunication Network amongst others.
358 pages. **£20.00**

HIGH POWER WIRELESS EQUIPMENT
Articles from Practical Electricity 1910 -1911
Edited by Henry Walter Young
305 pages. **£7.70**

LATEST INTELLIGENCE
James E. Tunnell, edited by Helen L. Sanders
A directory and dictionary of terms used in communications. The terms are laid out alphnumerically making it easy to decipher those obscure terms that you hear. More than 35 000 codes, terms acronyms and slang in use around the globe. *305 pages.* **£16.95**

MARINE SSB OPERATION
J. Michael Gale
How do you stay in touch when you sail off over the horizon and into the blue? What you need is a single sideband radio, a marine s.s.b. This book explains how the system works, how to choose and install your set and how to get the best out of it. There is also a chapter on amateur radio with the emphasis on the increasingly important maritime mobile nets. *96 pages.* **£10.95**

MARINE VHF OPERATION
J. Michael Gale
A v.h.f. radiotelephone is essential equipment for any sea-going boat, but what can you do with it? Who can you call, and how do you make contact? Which channel do you use, and why? What is the procedure for calling another boat, calling the family through the telephone system, or making a distress call? This book will tell you.
47 pages. **£7.95**

PASSPORT TO WORLD BAND RADIO 1995
This book gives you the information to explore and enjoy the world of broadcast band listening. It includes features on different international radio stations, receiver reviews and advice as well as the hours and language of broadcast stations by frequency. The 'blue pages' provide a channel-to-channel guide to world band schedules.
416 pages. **£14.50**

RADIOTELETYPE CODE MANUAL 13th Edition
Joerg Klingenfuss
This book gives detailed descriptions of the characteristics of telegraph transmission on short waves, with all commercial modulation types including voice frequency telegraphy and comprehensive information on all RTTY systems and c.w. alphabets. *96 pages.* **£14.00**

AN INTRODUCTION TO SCANNERS AND SCANNING BP311
I. D. Poole
This book is ideal for anyone wanting to know what scanning is, and how it works. There are also chapters on radio in general, covering antennas, radio waves and how they travel, types of transmissions, broadcasting and amateur radio. All in all a superb starter book. *152 pages.* **£4.95**

SCANNERS 2
Peter Rouse GU1DKD
The companion to *Scanners*, this provides even more information on the use of the v.h.f. and u.h.f. communications band and gives constructional details for accessories to improve the performance of scanning equipment. *261 pages.* **£10.95**

SCANNERS 3 PUTTING SCANNERS INTO PRACTICE. New Edition 4th Revision
Peter Rouse
The title *Scanners 3* has been chosen to avoid confusion, as the book has undergone a virtual rewrite since *Scanners 3rd Edition* was published. Although written by the late Peter Rouse, Chris Lorek G4HCL has edited and 'finished off' this, the latest in the *Scanners* series. Including frequency lists, and for the first time, a section on the h.f. bands. Also listed are full British bandplans from 25 to 2000MHz, as well as a section on scanner and accessory dealers. *271 pages.* **£9.95**

SHORT WAVE COMMUNICATIONS
Peter Rouse GU1DKD
Covers a very wide area and so provides an ideal introduction to the hobby of radio comms. International frequency listings for aviation, marine, military, space launches, search and rescue, etc. Chapters on basic radio propagation, how to work your radio and what the controls do, antennas and band plans. *187 pages.* **£8.95**

WORLDWIDE HF RADIO HANDBOOK
Martyn R. Cooke. *124 pages.* **£6.95**

1934 OFFICIAL SHORT WAVE RADIO MANUAL
Edited by Hugo Gernsback
A fascinating reprint from a bygone age with a directory of all the 1934 s.w. receivers, servicing information, constructional projects, circuits and ideas on building vintage radio sets with modern parts. *260 pages.* **£11.60**

MORSE

INTRODUCING MORSE
Collected Articles from *PW* 1982-1985
48 pages. **£1.25**

SECRET OF LEARNING MORSE CODE
Mark Francis
Updates for the Novice Licence. Designed to make you proficient in Morse code in the shortest possible time, this book points out many of the pitfalls that beset the student. *84 pages.* **£4.95**

BEGINNERS

ELECTRONICS SIMPLIFIED - CRYSTAL SET CONSTRUCTION
BP92 F. A. Wilson
Especially written for those who wish to take part in basic radio building. All the sets in the book are old designs updated with modern components. It is designed for all ages upwards from the day when one can read intelligently and handle simple tools.
72 pages. **£1.75**

ANTENNAS (AERIALS)

AERIAL PROJECTS *BP105*
Practical designs including active, loop and ferrite antennas plus accessory units.
96 pages. **£2.50**

ALL ABOUT VERTCAL ANTENNAS
W. I. Orr W6SAI & S. D. Cowan W2LX
Covers the theory, design and construction operation of vertical antennas. How to use your tower as a vertical antenna and compact vertical designs for restricted locations. All about loading coils and a.t.u.s.
192 pages. **£7.50**

ANTENNA EXPERIMENTER'S GUIDE
Peter Dodd G3LOO
Although written for radio amateurs, this book will be of interest to anyone who enjoys experimenting with antennas. You only need a very basic knowledge of radio & electronics to get the most from this book. Chapters include details on measuring resonance, impedance, field strength and performance, mats and materials and experimental antennas.
200 pages. ***£8.90***

ANTENNA IMPEDANCE MATCHING
Wilfred N. Caron

Proper impedance matching of an antenna to a transmission line is of concern to antenna engineers and to every radio amateur. A properly matched antenna as the termination for a line minimises feed-line losses. Power can be fed to such a line without the need for a matching network at the line input. There is no mystique involved in designing even the most complex multi-element networks for broadband coverage.
195 pages. **£14.50**

ANTENNAS FOR VHF AND UHF BP301
I. D. Poole
Antennas are a very important part of any receiver or transmitter and in this book the author gives a general background to antenna operation as well as describing antennas that are suitable for v.h.f. and u.h.f. operation. Chapters include Basic Concepts, Feeders, The Dipole, Aerial Measurements and Practical Aspects. There is something of use for everyone with an interest in antennas in this book.
104 pages. **£4.95**

ARRL ANTENNA BOOK
17th Edition
This volume now in its 17th edition contains essential information regarding propagation and constructional details of just about every type of antenna known to man. Included is a 3.5" diskette contain in PC programs for Yagi analysis, propagation forecasting, transmission line analysis and other. A definite must.
732 pages. **£19.95**

ARRL ANTENNA COMPENDIUM
Volume One
Fascinating and hitherto unpublished material. Among the topics discussed are quads and loops, log periodic arrays, beam and multi-band antennas, verticals and reduced size antennas.
175 pages. **£9.50**

ARRL ANTENNA COMPENDIUM
Volume Two
Because antennas are a topic of great interest among radio amateurs, ARRL HQ continues to receive many more papers on the subject than can possibly be published in *QST*. Those papers are collected in this volume. *208 pages.* **£9.50**

ARRL ANTENNA COMPENDIUM
Volume Three
Edited by Jerry Hall K1TD
As the title suggests, this book is the third in the continuing series on practical antennas, theory and accessories produced by the ARRL. The book reflects the tremendous interest and activity in antenna work, and provides a further selection of antennas and related projects you can build.
236 pages. **£9.50**

BEAM ANTENNA HANDBOOK
W. I . Orr W6SAI & S. D. Cowan W2LX
Design, construction, adjustment and installation of h.f. beam antennas. The information this book contains has been complied from the data obtained in experiments conducted by the authors, and from information provided by scientists and engineers working on commercial and military antenna ranges.
268 pages. **£7.50**

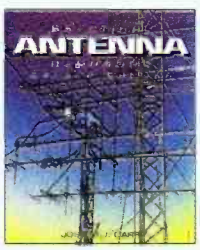
HF ANTENNA COLLECTION (RSGB)
Edited by Erwin David G4LQI
This book contains a collection of useful, and interesting h.f. antenna articles, first published in the RSGB's *Radio Communication* magazine, between 1968 and 1989, along with other useful information on ancillary topics such as feeders, tuners, baluns, testing and mechanics for the antenna builder.
233 pages. **£10.99**

HF ANTENNAS FOR ALL LOCATIONS RSGB
Les Moxon G6XN
This book provides a reference source for all h.f. antenna work, whether it be for fixed, mobile or using test equipment. In effect it is a manual on antenna work, with useful tips, projects and ideas.
322 pages. **£13.99**

INTRODUCTION TO ANTENNA THEORY *BP198*
H. C. Wright
This book deals with the basic concepts relevant to receiving and transmitting antennas, with emphasis on the mechanics and minimal use of mathematics. Lots of diagrams help with the understanding of the subjects dealt with. Chapters include information on efficiency, impedance, parasitic elements and a variety of different antennas. *86 pages.* **£2.95**

PRACTICAL ANTENNAS FOR NOVICES
John Heys G3BDQ
In this guide, written especially for newly qualified holders of the UK novice Licence, John Heys describes in detail how to build simple but efficient antennas for each of the Novice bands up to 434MHz, as well as useful ancillary equipment to ensure that they are working correctly. A complete chapter is devoted to the safety and common-sense aspects of installing and using a transmitting antenna.
This book will be invaluable not only to Novices, but also to any beginning amateur looking for easy-to-build antenna systems that really work.
52 pages, **£5.99**

PRACTICAL ANTENNA HANDBOOK
2nd Edition
Joseph J. Carr
As the name suggests, this book offers a practical guide at everything to do with antennas, from h.f. to microwaves. It also has sections on propagation, transmission lines, antenna fundamentals and a helpful introduction to radio broadcasting and communication. The book neatly balances a practical approach with the minimum of mathematics, good diagrams and a lively text. *437 pages.* **£23.95**



PRACTICAL WIRE ANTENNAS RSGB
John Heys G3BDQ
Many radio enthusiasts have to be content with wire antennas. John Heys' practical approach to wire antennas provides plenty of ideas and projects to help get the best out of a simple system. A helpful book, and good reference source.
100 pages. **£8.50**

G-QRP CLUB ANTENNA HANDBOOK
Compiled and edited by P. Linsley G3PDL & T. Nicholson KA9WRI/GW0LNQ
This book is a collection of antenna and related circuits taken from *Sprat*, the G-QRP Club's journal. Although most of the circuits are aimed at the low-power fraternity, many of the interesting projects are also useful for general use. Not intended as a text book, but offers practical and proven circuits. *155 pages.* **£5.00**

RADIO AMATEUR ANTENNA HANDBOOK
W. I. Orr W6SAI & S. D. Cowan W2LX
Yagi, Quad, Quagi and LPY beam antennas as well as vertical, horizontal and sloper antennas are covered in this useful book. How to judge the best location, DX antenna height, ground loss and radials.
188 pages. **£7.50**

RECEIVING ANTENNA HANDBOOK
Joe Carr
Your receiver is only as good as your antenna. This book is a complete guide to high performance receiving antennas. It is a comprehensive examination of antennas intended specifically for receiving purposes. An essential addition to your technical library, the listeners antenna bible. *189 Pages.* **£17.50**

SIMPLE, LOW-COST WIRE ANTENNAS FOR RADIO AMATEURS
W. I. Orr W6SAI & S. D. Cowan W2LX
Efficient antennas for Top Band to 2m, including 'invisible' antennas for difficult station locations. Clear explanations of resonance, radiation resistance, impedance, s.w.r., balanced and unbalanced antennas are also included.
188 pages. **£7.50**

W1FB'S ANTENNA NOTEBOOK
Doug DeMaw W1FB
This book provides lots of designs, in simple and easy to read terms, for simple wire and tubing antennas. All drawings are large and clear making construction much easier. There is no high-level mathematics in this book, just simple equations only when necessary to calculate the length of an antenna element or its matching section. *123 pages.* **£6.95**

YAGI ANTENNA DESIGN
Dr James. L. Lawson W2PV
This book is a polished and expanded version of a series of articles first published in *Ham Radio* following on from a series of lectures by the author, who was well-known as the expert on Yagi design. Chapters include simple Yagi antennas, loop antennas, effect of ground, stacking and practical antenna design.
210 pages. **£10.95**

25 SIMPLE AMATEUR BAND AERIALS *BP125*
E. M. Noll
63 pages. **£1.95**

25 SIMPLE INDOOR AND WINDOW AERIALS *BP136E*
E. M. Noll
50 pages. **£1.75**

25 SIMPLE SHORT WAVE BROADCAST BAND AERIALS *BP132*
E. M. Noll
63 pages. **£1.95**

25 SIMPLE TROPICAL AND MW BAND AERIALS *BP145.*
E. M. Noll
54 pages. **£1.75**

£50 PRIZE DRAW
If you are ordering a book don't forget you'll be entered into our prize draw. See the top of page 87 for full details.

FAULT FINDING

GETTING THE MOST FROM YOUR MULTIMETER *BP239*
R. A. Penfold
This book is primarily aimed at beginners. It covers both analogue and digital multi-meters and their respective limitations. All kinds of testing is explained too. No previous knowledge is required or assumed.
102 pages. **£2.95**

HOW TO USE OSCILLOSCOPES & OTHER TEST EQUIPMENT *BP267*
R.A. Penfold
Hints and ideas on how to use the test equipment you have, to check out, or fault find on electronic circuits. Many diagrams of typical waveforms and circuits, including descriptions of what waveform to expect with particular faults, or distortion in audio amplifiers. *104 pages.* **£3.50**

MORE ADVANCED TEST EQUIPMENT CONSTRUCTION *BP249*
R.A. Penfold
A follow on from *Test Equipment Construction (BP248)* this book looks at digital methods of measuring resistance, voltage, current, capacitance and frequency. Also covered is testing semi-conductors, along with test gear for general radio related topics.
102 pages. **£3.50**

TROUBLESHOOTING WITH YOUR TRIGGERED-SWEEP OSCILLDSCOPE
Robert L. Goodman
This book steers you through the various features - old and new - that scope technology provides and is an invaluable guide to getting the best out of your scope. An overview of available scopes will help you choose the one that best suits your needs. Areas covered include spectrum analysis, test applications, multiple-trace displays, waveform analysis, triggering, magnified sweep displays, analogue and digital scopes, etc. *309 pages.* **£17.50**

MORE ADVANCED USES OF THE MULTIMETER *BP265*
R.A. Penfold
This book is primarily intended as a follow-up to BP239, *Getting the most from your Multi-meter*. By using the techniques described in this book you can test and analyse the performance of a range of components with just a multi-meter (plus a very few inexpensive components in some cases). The simple add-ons described extend the capabilities of a multi-meter to make it even more useful. *96 pages.* **£2.95**

OSCILLOSCOPES, HOW TO USE THEM, HOW THEY WORK. 3rd Edition
Ian Hickman
248 pages. **£15.95**

TELEVISION

ATV COMPENDIUM
Mike Wooding G6IQM
This book is for those interested in amateur television, particularly the home construction aspect. There isn't a 70cm section as the author felt this was covered in other books. Other fields such as 3cm TV, are covered in depth. A must for the practical ATV enthusiast. *104 pages.* **£3.00**

INTERFERENCE

INTERFERENCE HANDBOOK (USA)
William R. Nelson WA6FQG
How to locate & cure r.f.i. for radio amateurs, CBers, TV & stereo owners. Types of interference covered are spark discharge, electrostatic, power line many 'cures' are suggested. *250 pages.* **£9.50**

MAPS

NORTH ATLANTIC ROUTE CHART
This is a five-colour chart designed for the ATC in monitoring transatlantic flights. Supplied folded.
740 x 520mm. **£6.50**

RADIO AMATEURS MAP OF THE WORLD
This a brightly coloured map clearly showing callsign prefixes for the world and is up-to-date with recent European boundary changes. Supplied folded in a clear plastic wallet.
980 x 680mm. **£5.95**

QTH LOCATOR MAP OF EUROPE
Traxel DK5PZ
Radio Map Service
This comprehensive map of the European callsign area has now been updated and enhanced. This well thought out, coloured map covers from N. Africa to Iceland and from Portugal in the west to Iran in the east. Folds to fit into the 145 x 240mm clear envelope.
1080 x 680mm. **£5.95**

SUBSCRIPTION RATES

From 1st April 1995

SHORT WAVE MAGAZINE - 1 YEAR

❑ **£25.00** (UK) ❑ **£28.00** (Europe)
❑ **£30.00** (Rest of World)
Please enquire for airmail rates

SPECIAL JOINT SUBSCRIPTION WITH PRACTICAL WIRELESS (1 YEAR)

❑ **£42.00** (UK) ❑ **£47.00** (Europe)
❑ **£51.00** (Rest of World)

Please start my subscription with the .....issue.

SPECIAL OFFER Page 41

❑ Please send me .....AB118 antenna(s)
@ £16.30 inc P&P (UK).....**£**
(Overseas readers please enquire).

SUBS CLUB Page 51

❑ Please send me .....AA cells & charger(s)
@ £22.45 inc P&P (UK).....**£**

BINDERS

❑ Please send me .... *SWM* Binder(s)
@ £5.50 each. **£**
Postal charges: £1 for one, £2 for two or more
(UK & overseas surface)

BOOK BONANZA OFFER

❑ Please send.....*WRTH '94 & Ferrells*
@ £21.95 .....**£**

.....**£**
.....**£**
.....**£**
.....**£**
.....**£**
.....**£**
.....**£**
.....**£**

Postal charges.
UK: £1 for one, £2 for two or more. **£**
Overseas:
£1.75 for one, £3.50 for two or more. **£**
NEW FASTER NEXT DAY SERVICE (UK)
(For orders received am) £3.75 **£**

GRAND TOTAL **£**

ORDER FORM

FOR ALL MAIL ORDER PURCHASES IN SHORT WAVE MAGAZINE

We have re-designed our Order Form to accommodate the new Cardcharge service for Subscribers. This enables Subscribers to save a lot of hassle by using their credit card to pay for their subscription on an automatic annual renewal basis. To take advantage of this service complete the special Cardcharge form at the foot of this page and we will take care of the rest.

CREDIT CARD ORDERS TAKEN ON (01202) 659930
between the hours of 8.30 a.m. - 4.30 p.m. Outside these hours your order will be recorded on an answerphone

FAX ORDERS TAKEN ON (01202) 659950
Or please fill in the details ticking the relevant boxes, a photocopy will be acceptable to save you cutting your beloved copy!

To: PW Publishing Ltd., FREEPOST, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

PAYMENT DETAILS

Name.....

Address.....

.....

.....Postcode.....
Telephone No.....

I enclose cheque/PO (Payable to PW Publishing Ltd.) **£** **$**
Or
Charge to my Access/Visa Card the amount of **£** **$**

Card No. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Valid from.....to.....

Signature .....Tel:.....

Orders are normally despatched by return of post but please allow 28 days for delivery. Prices correct at time of going to press. **Please note:** all payments must be made in Sterling.

CREDIT CARD ORDERS TAKEN ON (01202) 659930
FAX ORDERS TAKEN ON (01202) 659950

Use this part of the Order form **only** if you want to use Cardcharge to pay for your subscription. If you want to take out a subscription, or order other items and want to pay by conventional methods, please use the main part of the Order Form.

CARDCHARGE AUTHORITY (for subscriptions only)

To .....

I authorise you, until further notice in writing, to charge my .....card unspecified amounts in respect of.....(yearly magazine subscription) as and when they become due

Visa/MasterCard account number ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Expiry date ☐☐☐☐

Name (as on credit card).....

Full Address.....

.....

.....

.....Postcode.....

Merchant reference 6940936

Signature .....

Date .....

This authority may be cancelled by writing to PW Publishing Ltd. at any time.

ADVERTISERS INDEX

PUBLISHED on the fourth Thursday of each month by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Printed in England by Southernprint (Web Offset), Factory Road, Upton Industrial Estate, Poole, Dorset BH16 5SN. Tel: (01202) 622226. Distributed by Seymour, Windsor House, 1270 London Road, Norbury, London SW16 4DH. Tel: 081-679 1899, Fax: 0181-679 8907, Telex: 881245. Sole Agents for Australia and New Zealand – Gordon and Gotch (Asia) Ltd.; South Africa – Central News Agency Ltd. Subscriptions INLAND £22, EUROPE £25, OVERSEAS (by ASP) £27, payable to SHORT WAVE MAGAZINE, Subscription Department, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. SHORT WAVE MAGAZINE is sold subject to the following conditions, namely that it shall not without the written consent of the publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever.

IC-738

HF 300kHz-29.995 MHz
All Mode Transceiver

- All band, all mode transceiver with a general coverage receiver
- Automatic antenna tuner
- Automatic antenna selector
- Quick split function with pre-programmable offset
- 1Hz tuning steps
- RIT and ΔTX with calculate function
- Memo pads
- PBT function and notch filter
- Speech compressor
- VOX function
- Double band stacking register
- 101 Memory channels
- Versatile scans

ICOM

ICOM manufacture a full range of base-stations, mobiles and handheld transceivers and receivers to cover all popular Ham frequencies... and beyond. No matter what your requirements, ICOM have the radio for you.

For the full picture and details of your local authorised Icom dealer contact:

Icom (UK) Ltd. Sea Street Herne Bay Kent CT6 8LD.

Telephone: 0227 743001(24hr). Fax: 0227 741742.

famous the world over

The Lowe receiver range

- **HF-150**
  Your first 'real' receiver
- **HF-150M**
  Marine version of the HF150
- **SP-150**
  Matching speaker/filter for the HF150
- **PR-150**
  RF preselector for the HF150
- **RK-150**
  Stack and rack system
- **HF-225**
  Higher specification h.f. receiver
- **HF-225E**
  Super high performance model

Manufactured by:
Lowe Electronics,
Chesterfield Road,
Matlock, Derbyshire, DE4 5LE, UK

Distributors and dealers in most countries

Contact Lowe Electronics to find out your nearest dealer

Tel: (01629) 580800
Fax: (01629) 580020