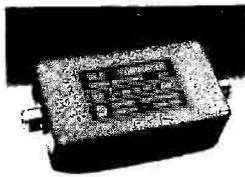




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CONVERTS INCOMING VLF SIGNALS TO FREQUENCIES 28MHz HIGHER. FOR EASY TUNING ON NORMAL COMMUNICATIONS RECEIVERS. SIMPLY CONNECTS IN SERIES WITH THE ANTENNA.



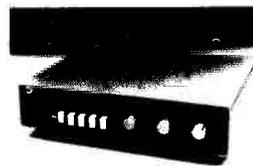
**AD 270/370 £51.75/69.00** (carriage £2.00)  
ULTRA-COMPACT RECEIVING ANTENNA SYSTEMS GIVING WIDEBAND COVERAGE FROM 200kHz to 30MHz AT HIGH SENSITIVITY. MODELS AD270 AND AD370 GIVE SIMILAR RECEIVE PERFORMANCE TO LARGE CONVENTIONAL ANTENNA SYSTEMS YET ARE ONLY 3 METRES IN OVERALL LENGTH. THE BALANCED DIPOLE CONFIGURATION ALSO GIVES GOOD REJECTION OF LOCAL INTERFERENCE.



**DC 144/28 £39.67** (carriage £2.00)  
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**PC1 £137.42** (carriage £2.00)  
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FULLY AUTOMATIC NOTCH FILTER FOR "HANDS-OFF" REMOVAL OF TUNE-UP WHISTLES AND OTHER STEADY TONE INTERFERENCE. INDEPENDENT LOW-PASS AND HIGH-PASS FILTERS WITH VERY STEEP CUT-OFF FOR REMOVING "MONKEY CHATTER" AND OTHER OFF-TUNE INTERFERENCE FROM SSB SIGNALS. BOTH FILTERS TUNE CONTINUOUSLY FROM 200 TO 3500 Hz. SECOND NOTCH FILTER TUNES MANUALLY FROM 200 TO 3500 Hz.



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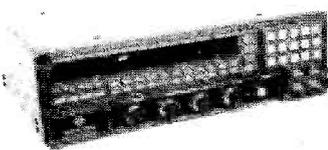
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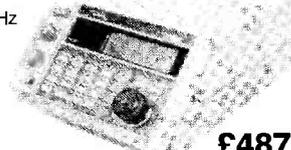
## JIL SX-400 THE PROFESSIONAL SCANNER



- \* Basic coverage 26-520MHz
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- \* Expandable from 100kHz to 1.4GHz with SSB and CW
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- \* IF output terminals
- \* Specifications set by professionals

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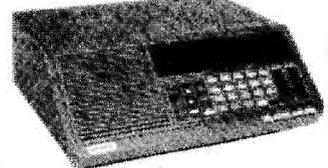
## AOR 2002 THE WIDE RANGE SCANNER



- \* Covers: 25-550MHz, 800MHz-1.3GHz
- \* AM & NFM & WFM on all bands
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- \* 20 memories
- \* Compact size
- \* 12V dc operation
- \* Up/down step control knob

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- \* Covers: 60-180MHz, 380-520MHz
- \* AM & NFM on all bands
- \* Search & store of active channels
- \* Channel activity counter
- \* 70 memories
- \* 12V dc & 240V ac

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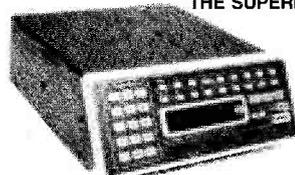
## REGENCY HX-850E THE SMALLER HANDY-SCANNER



- \* Covers: 75-106MHz or 60-90MHz plus 118-175MHz, 406-496MHz
- \* AM & NFM programmable on all bands
- \* Full scan & search functions are available
- \* 20 memories
- \* Measures only 2.5" x 5.5" x 2"
- \* Nicads, charger & BNC whip antenna included in the price

£279

## JIL SX-200N THE SUPERIOR SCANNER



- \* The choice of the professionals
- \* Proven reliability
- \* Covers: 26-88MHz, 108-180MHz, 380-514MHz
- \* AM & NFM on all bands
- \* Positive action keyboard
- \* 16 memories
- \* 12V dc & 240V ac

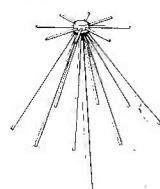
£325

## DON'T FORGET THE ANTENNA!

All receivers need a good antenna and the BRITISH-MADE REVCO NE is used throughout the world by discerning scanner owners. Covers 50-500MHz, extremely well made & excellent value at..... £31.95  
For those who will appreciate extra performance we offer the REVCO RADAC dipole nest with transmitting capability from 25-500MHz..... £69.95

## BROADBAND PREAMPLIFIERS

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Ask for our secondhand scanner bargain list.



VOL. 45 ISSUE 9 DECEMBER 1987  
ON SALE NOVEMBER 26th

11 | SWM Review



**Cover** The Uniden Bearcat UBC 175XL base station scanning receiver is the subject of our review this month.

Unfortunately, our *Bandscan* feature has had to be held over this month due to lack of space

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ART EDITOR: Rob Mackie  
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# FIRST WORD



As explained last month, this issue marks the end of Volume 45. I know that it may look a bit strange, having had thirteen issues in Volume 44, to follow on with only nine to complete Volume 45, but it will bring us into step with the calendar, making life much easier in the future. The other interesting thing about the volume numbers is that although the magazine has been published for over 50 years, only 45 volumes have been completed. The answer lies, of course, with the fact that the magazine did not come out during the Second World War — the staff all "went to war".

The long awaited Scanning column starts in this issue. Don't forget that it needs your input to ensure that it is lively and interesting.

So, if you are a scanning nut then drop Alan Gardener a line and ensure the new column's success. Airband started out in just the same way, and, judging by the amount of mail that

Godfrey Manning now receives, is very popular indeed.

The hurricane that swept across the south of England during the night of Oct. 15/16 left thousands without essential services. Amongst these were two of our regular "Seen & Heard" correspondents — Ron Ham and Brian Oddy. We work to very tight deadlines for all the "Seen & Heard" sections and to meet these both Ron and Brian use word processors. Without electricity they are useless, and without the telephone it's difficult to let anyone know — a state of affairs that lasted for over a week! That this issue has Ron's and Brian's columns at all is a miracle indeed — thanks Ron and Brian. DICK GANDERTON

## A WORD IN EDGEWAYS

Sir

*I would like to add some more feedback concerning pirate and clandestine radio stations.*

*As regards pirate stations such as Radio Sinn Fein, I agree with the other readers' reactions about having a column for these stations. It is this magazine's moral duty for the protection of the reader to stop this. Listing the radio of such a violent organisation would surely offend many listeners and seriously jeopardise the reputation of the magazine. I would like to point out now my utter dislike for stations of such an obnoxious manner.*

*I would like to fight the case for a short wave clandestine stations listing. This truly neglected aspect of the hobby in this country, due to legislation, is worthy of more publicity. I cannot see how the politics of foreign groups can harm or offend the British reader. In my opinion their policies should be regarded as a matter of an interesting education, as I have found through my listening. There is no reason for such listings in a magazine column to be political or politically biased. For instance, a political profile of any given station would be merely a statement of fact, showing no opinions on the part of the magazine.*

*I would like to point out that a very informative column, which shows*

*absolutely no bias, exists and thrives in the Danish Shortwave Club's International Bulletin, and no doubt caters for the needs of the isolated British listener — lost competition on your part.*

*I find this aspect of my hobby enthralling and an education as to the state of many nations. Indeed, some of my best loggings have been clandestine stations.*

*I would like to see mine and many other clandestine enthusiasts' needs met by my favourite British magazine. I believe that this very fascinating aspect of our great hobby is the final hole to fill, and I have no qualms about this happening. I have to stress that activity which might affect the British readers, such as Sinn Fein, is not acceptable and is the only obstacle to a specialist column. I also hope that there will be favourable reaction from fellow readers and listeners who seem opposed to our hobby. I will also say that I am very active in monitoring official broadcasts.*

MICHAEL OSBORN (16)  
CHELMSFORD

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

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 other magazines.

Sir

*The letters regarding pirates printed in SWM appear to suggest that information regarding them is much sought after. So be it — I must be in the minority.*

*However the letter from G3ZHI in the November 87 issue of SWM suggesting that failure to print information regarding Pirates, Corsairs, Week-end Radio Stations, "Naughty-Naughty" sidebanders, etc., amounts to censorship of the Spy Catcher kind is, perhaps, a little off frequency.*

*Freedom within the law is, in my view, a very pleasant way of life — the author of Spy Catcher does not share this view.*

*Good luck to SWM, you have really excelled yourselves with the November 87 issue; it really is very good reading for "The Radio Listener" who can perhaps look forward to an addition to the "Seen & Heard" feature — "Pirate Corner" with names, addresses, times and frequencies listed, of course!*  
E. SWAN  
EASTBOURNE

The controversy still rages over the subject of pirates and clandestines. Whatever the arguments put forward I still have to take into account the fact that this country is very cosmopolitan. There are people living here from all countries, creeds and religions, and their views must be taken into account when trying to decide what will, or will not, cause offence.

Just because the events are taking place on the other side of the world it doesn't mean that no one in the UK is affected. And what about the growing number of overseas readers of the magazine?

I can see the usefulness of listing such stations so that readers can identify what they have heard — and at least if you know that what you have come across is a pirate or clandestine station you can wield the ultimate power of censorship and quickly retune the set to another frequency — can't you?

I will let the arguments continue for another issue and then pronounce the matter closed. ED

Sir

*HELP! Where can I beg, borrow or photocopy an instruction manual for a Realistic DX-200 receiver?*

*I think that "Airband" is the best section of a great magazine.*

D. T. KEELY  
ANGLESEY  
Can any reader help Mr. Keely? If so please reply through the Editorial Offices at Poole. ED

# WHAT'S NEW

## Clamp-on Chokes

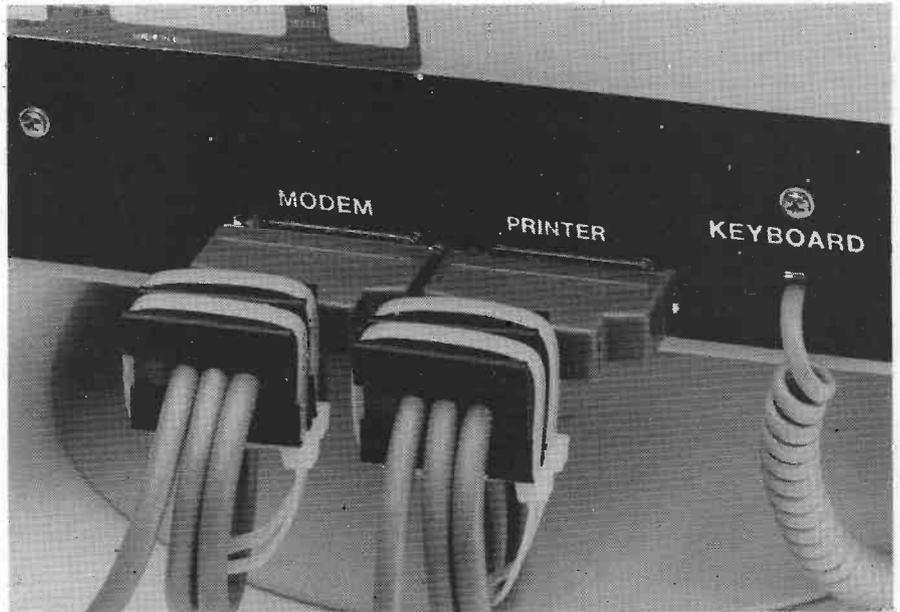
A few months ago in *Bandscan*, Peter Laughton mentioned some clamp-on radio frequency chokes. At that time all he was able to give as a supplier was a Canadian address. We have since heard that AKD supply them (their design is the subject of a patent application).

They can supply two kit sizes, UF8 and UF4 and each kit contains the following:

	UF8	UF4
Ferrite "U" Cores	16	8
Clamping extrusion	16	8
Re-usable ties	8	4
Adhesive strip	1	1
Application & Info	1	1
Price inc. VAT P&P	£19.95	£9.89

For more details you should contact:

AKD  
Unit 5  
Parsons Green Estate  
Boulton Road  
Stevenage  
Herts SG1 4QG



## VNG Goes Off The Air

Not altogether unexpected perhaps, but as anticipated by George Hewlett in *SWM* a few months ago, the Australian time and frequency station VNG at Lyndhurst has gone off the air. This is 23 years after being inaugurated by the Australian Post Office.

The purpose of the service was to provide accurate time signals and standard frequencies for use, throughout Australia, by organisations making seismic and other scientific measurements.

Based at Lyndhurst, in the state of Victoria, the operating frequencies were 12, 7.5 and 4.5MHz.

Peter Anderson, a member of the Australian Astronomical Association, described the move as being unfortunate and a loss to astronomical researchers. The alternative was, he said, WWVH in Hawaii, which was not only weaker but also suffered from fading.



## Steam Powered Santa

Steam radio comes alive again this year at Didcot Railway Centre in South Oxfordshire. Members of the Great Western Society, assisted by amateurs from local radio clubs, will be operating GB4GWR during the Railway Centre's Santa Steamings on December 6, 13 and 20.

The Railway Centre, which houses a huge collection of Great Western Railway locomotives, rolling stock and memorabilia, will be open from 11am to 5pm each day. Presents will be available for children in Santa's steam train grotto.

GB4GWR will be active during the opening hours of the Railway Centre so all visitors will be welcome. Only one station will be active at a time because of a move into a warmer, but smaller shack. As usual QSL cards will be available. Why not collect yours in person and enjoy a good day out for all the family.

More details can be obtained from:

John O'Hagan G4PFY  
Brubell  
27 Colne Close  
Grove  
Wantage  
Oxfordshire OX12 0NN

## Power Supplies



South Midlands Communications have introduced three new models of their 13.8V d.c. power supplies.

All the units have line regulations of less than 1 per cent and r.m.s. ripple of just 2mV. That means they are suitable for all kinds of electronic equipment.

The RU120406 is designed for a constant 4 amps but will provide a surge to 6 amps.

The RS120810 is suitable for up to 8 amps constant and 10 amp surge. It also has over voltage protection.

Finally there is the SS122535 which is suitable for 25 amps constant and 35 amps surge. This p.s.u. is not only voltage

protected but also has terminals for remote voltage sensing. This compensates for voltage drop on the output cable, therefore maintaining a constant voltage at load.

More details are available from:

SMC Ltd  
SM House  
School Close  
Chandlers Ford Ind Est  
Eastleigh  
Hampshire  
SO5 3BY  
Tel: (0703) 255111

# WHAT'S NEW

## Stamp Collection

At *SWM*, we're always pleased to hear of a worthy cause, especially when those in the world of radio try and help others. So, if you get lots of post through your door we've heard of a way you can help.

John Allsopp G4YDM is collecting postage stamps, new, used, Foreign or British. He doesn't even mind whether they are still attached to the envelope or not.

He is hoping to raise money from these stamps to purchase a transceiver for a disabled amateur. If you have stamps you can send, dispatch them to:

John Allsopp G4YDM  
30 Manor Park  
Concordvill  
District 11  
Washington  
Tyne and Wear  
NE37 2BT

## DXAGB

Volume VIII Number 8 of DXAGB News has landed on the desk this month.

There is another part of the series by Nick Rank about Marine Radiobeacon DXing, which has been very interesting and Frank Baldwins Shortwave Logbook is enough to make anyone green with envy. He seems to be logging at all hours of the day and night and hears the most wonderful DX, when does he sleep and eat, I wonder. If only my log book looked remotely similar. Still it encourages me to try harder.

If you would like more details on the DX Association of Great Britain, then write to:

Alf Brimming  
DX-AGB  
43 Atwood Drive  
Bristol  
BS11 0SR

## Vintage Wireless

If vintage wireless is your forté then perhaps you should be reading the Bulletin of the British Vintage Wireless Society.

The very smart magazine contains a wealth of information for those interested in the bygone era. There are loads of adverts so you can find the firm that stocks that elusive part you needed to restore your favourite set.

There are news pages, articles about classic sets, projects, articles about vintage television as well as historical articles and readers letters.

If you would like more details such as subscription rates and the like, then write to:

Robert Hawes  
63 Manor Road  
Tottenham  
London  
N17 0JH.

## HCJB

On November 30, the DX Partyline programme is: "What's the inside industry scoop about radio equipment?" They are presenting the programme from the 1987 ANARCON Equipment Manufacturer's Forum.

That's at 2130 on 15.270 and 17.790 for Europe.

## Oldest Aussie QSLs

Who has the oldest QSL card or letter issued by Radio Australia or by its predecessors? Have you any reminiscences of Radio Australia's early days of broadcasting?

In 1989, Radio Australia will celebrate its 50th year of regular transmission to the world. As part of a number of special programmes already contemplated by the ABC, they want to find who has the oldest QSL amongst its listeners.

If you have an early QSL or can recall the early days of Radio Australia or its predecessors, write to:

Radio Australia (Jubilee Year)  
PO Box 429G  
Melbourne  
Victoria  
Australia 3001

## MEDIA NETWORK

Media Network, broadcast by Radio Netherlands, is a weekly survey of communications developments compiled with the assistance of over 165 monitors spread across the globe. This audio magazine runs on enthusiasm, building on more than 26 years of experience in this field of programming.

Media Network reflects trends within the

media business both in The Netherlands and around the world.

**November 26:** *The Long Path through Asia Part One.* After a slight delay(!), Media Network is finally off on a round the globe tour. This week they stop off in Thailand, looking at the complicated media in this exotic Asian country. They also tune around

the dial letting the listener hear sound that will never reach most English speaking parts of the world.

**December 3:** *The Long Path Through Asia Part Two.* From Bangkok, they fly to Jakarta taking the train through Java. What is happening to the Indonesian media scene. Are all the short wave local stations on the way out? What is left of the Dutch colonial influence in this fast developing Asian society? They also include Pacific media news from Arthur Cushen.

**December 10:** *News Update.* This week we concentrate on the background items, including input from Richard Ginbey and John Campbell.

**December 17:** *Christmas Preview.* This week's edition includes an interview with Dutch electronics specialist Willem Bos. He's been examining active antennas for the WRTH 1988 edition. He's come to some interesting conclusions, and these will be illustrated in today's programme. Andy Sennitt, just back from the United States, will be passing on last minute media news.

**December 24:** *The Party.* This year they'll be holding a Christmas party, inviting contributors to pass on their greetings and also to report on their best and worst Christmas gift. Wrapped up in the programme will be the usual serving of media developments, including a summary of the past year's propagation trends from Mike Bird.

**December 31:** *Best of the Worst.* More mistakes from the world of radio broadcasting. You can hear examples taken from Radio Netherlands, and other stations around the globe. They also look at why those bloopers happened. They also look at some of the more unusual requests stations have had from listeners in 1987. Gene Reich gives us a classic example. □



# BOOKCASE

## THE SATELLITE EXPERIMENTERS HANDBOOK

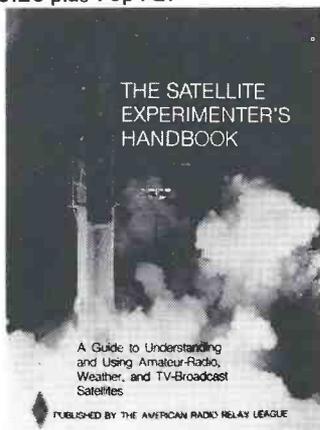
Published by the ARRL

Available from Short Wave Magazine Book Service  
210 x 275mm, 207 pages. Price £9.25 plus 75p P&P

In this book is the information you need to communicate through or pick up the signals from orbiting satellites. Whether your interest is in amateur radio, weather, TV broadcast or other spacecraft, you'll find an immense store of valuable data.

The book covers the early days of space communications, so you have lots of background information. It tells you how to get started, what you need and provides profiles of various spacecraft.

There is even a chapter labelled "So you want to build a satellite" in Part III — the section for the advanced radio amateur!



## SOLID STATE SHORT WAVE RECEIVERS FOR BEGINNERS (BP222)

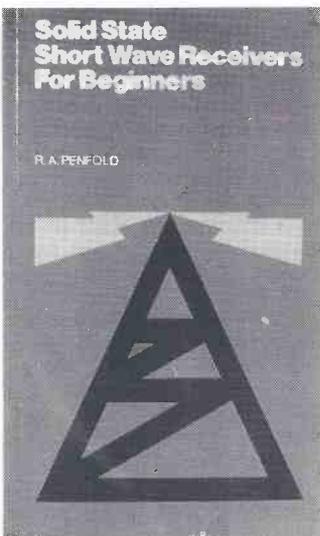
by R. A. Penfold

Published by Bernard Babani (publishing) Ltd  
Available from Short Wave Magazine Book Service  
110 x 178mm, 93 pages. Price £2.95 plus 75p P&P  
ISBN 0 900 162 62 7

There is a strange fascination in listening to a broadcast which has been transmitted from a station that may be many thousands of kilometres away across the other side of the world. This has helped make short wave listening one of the most popular branches of the radio and electronics hobby world.

This book not only gives the reader plenty of receivers to build, but gives the details on how they work, how to use them and constructional hints.

Described are crystal sets, regenerative receivers, a portable reflex receiver, a single band receiver as well as some using f.e.t.s. The circuits described should provide suitable levels of performance, despite the fact they only use relatively few and inexpensive components.



## PROJECTS IN AMATEUR RADIO AND SHORT WAVE LISTENING

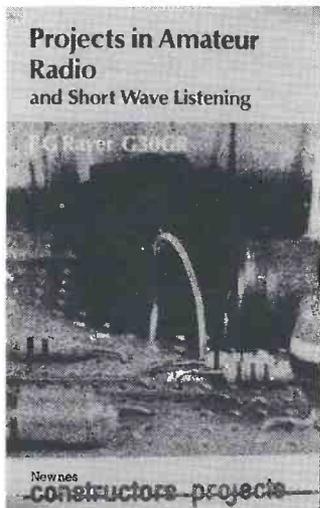
by F. G. Rayer G3OGR

Published by Newnes Constructors Projects  
Available from Short Wave Magazine Book Service  
134 x 210mm, 90 pages. Price £4.95 plus 75p P&P  
ISBN 0 408 00502 5

Throughout the world there are more than 750 000 licensed radio amateurs and many thousands of enthusiasts who, while not operating their own transmitters, share the excitement and interest of amateur radio through short wave listening. The receivers and other aids described in this book are relatively easy to build and will be equally useful to the licensed amateur and short wave listener.

Full constructional details are given for all projects, including housing the units in a suitable case.

Projects such as antennas, antenna tuning units, dummy load, converters and receivers are all covered.



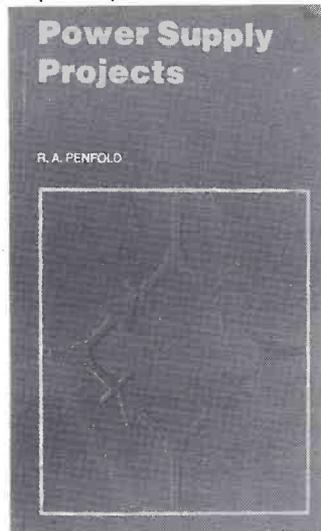
## POWER SUPPLY PROJECTS (BP76)

by R. A. Penfold

Published by Bernard Babani (publishing) Ltd  
Available from Short Wave Magazine Book Service  
110 x 178mm, 91 pages. Price £2.50 plus 75p P&P  
ISBN 0 900162 96 1

The purpose of this book is to give a number of power supply designs, including simple unregulated types, fixed voltage regulated types, and variable voltage stabilised designs, the latter being primarily intended for use as bench supplies for the electronics workshop. The designs provided are all low voltage types for semiconductor circuits.

There are other types of power supply apart from the mains to low voltage type and a number of these are dealt with in the final chapter, including a cassette power supply, NiCad battery charger, voltage step-up circuit and simple inverter.



## OSCILLOSCOPES How to Use Them How They Work

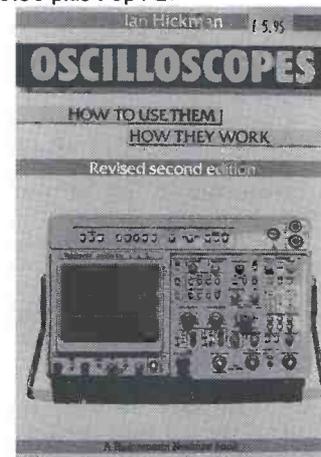
Revised 2nd Edition

by Ian Hickman

Published by Heinemann Newnes  
Available from Short Wave Magazine Book Service  
135 x 214mm, 133 pages. Price £5.95 plus 75p P&P

Oscilloscopes are essential tools for checking circuit operation and diagnosing faults, and an enormous range of models is available. But which is the right 'scope for a particular application? Which features are essential, which not so important? What techniques will get the best out of the instrument?

This book goes a long way to answering these questions and many more. If you are a student, then it will be even more useful as it discussed in detail how 'scopes work. It also helps the person trying to decide whether that particular model is a bargain or not.



## HOW TO BUILD ADVANCED SHORT WAVE RECEIVERS (BP226)

by R. A. Penfold

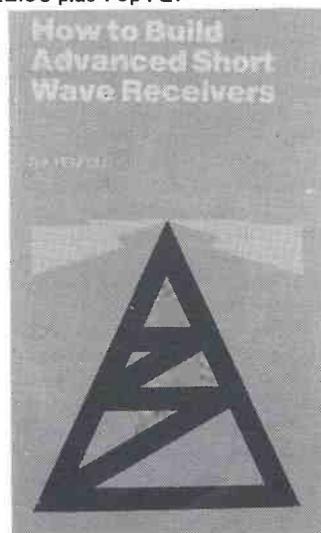
Published by Bernard Babani (publishing) Ltd  
Available from Short Wave Magazine Book Service  
110 x 178mm, 118 pages. Price £2.95 plus 75p P&P  
ISBN 0 900 162 67 8

Although many short wave listeners use commercial equipment these days, a great deal of satisfaction and enjoyment can be gained from the hobby by using home-constructed equipment.

Using ready-made short wave gear gives very little insight to how the equipment works. Obviously, the story is very different when you build your own!

Full constructional details are given for a number of receivers, both single and double superhets. There are add-on circuits given, such as Q Multiplier, crystal filter, noise limiters and preselector amongst others.

Plenty to keep you busy during the coming winter months.



Lorna Mower

Starting this month with the **Ichen Valley RC**, who meet on the 2nd and 4th Fridays of the month at 7.30pm in The Scout Hut, Brickfield Lane, Chandlers Ford, Eastleigh. November 27 is a general talk about Radio by G6NZ and December 11 is their Christmas Party. More details from Maurice Cheeseman G1IPQ on Southampton 736784.

**Tor ARA** have a talk entitled Airband Frequencies by G3VGW on December 8. The club meets every Tuesday in the Greyhound Hotel, Market Place, Cromford at 7.30pm. For more information contact Clive GOFWI on Matlock 3503.

The **Ripon and District ARS** meet every Thursday at 7.30pm in the Old Air Raid Shelter (behind Ripon Town Hall). December 17 is their Christmas Bring & Buy organised by David G1AUC and January 8 is the club's Christmas dinner organised by Jack G8TDC. For further information contact Liz Bulman at The Lodge, Lister House, Sharow HG4 5BU.

Two events planned this month for all those at the **Wakefield & District RS**. December 1 is on the air night and the 22nd is their Christmas Social, there will be no meeting on the 29th. They meet Tuesday evenings at 7.45pm in the Community Centre, Prospect Road, Ossett. John Bryan G4VRY on Leeds 820198 will tell you more.

The **Coulsdon ATS** meet every 2nd Monday in the month at 7.45 in St Swithun's Church Hall, Grovelands Road, Purley. They have an AGM planned for December 14. More details from Alan on Thornton Heath 0610.

The **East Kent RS** have an Annual Cheese & Wine Party on December 3, and a natter night follows on the 17th. Meetings are held on the 1st and 3rd Thursdays of each month at 7.30pm in the Cabin Youth Centre, Kings Road, Herne Bay. For more information contact Brian Didmon G4RIS, on Whitstable 262042.

December 16 is the Christmas Social for all those at the **Hastings Electronics & Radio Club**. The club meets every 3rd Wednesday at 7.45pm in the West Hill Community Centre, Croft Road, and also every Friday at 8pm in the Club Room, Ashdown Farm Community, Downey Close. Dave Shirley G4NVQ on Hastings 420608, will I'm sure tell you any other details.

**Todmorden and District ARS** meet on the 1st and 3rd Mondays at 8pm in The Queen Hotel, Todmorden. George Dobbs gives an Annual Christmas Lecture & Social (members only) on December 7, a Natter Night follows on the 21st, and on January 4 there is a Construction competition. More details from

G1GZB on Todmorden 7572.

The **Atherstone ARC** meet on the 2nd and 4th Mondays of each month at 7.30pm in the Physics Laboratory, Atherstone Upper School, Long Street. There is a talk by R. J. Hammond (Shift Charge Engineer, Rugeley Power Station) on "Central Electricity Generating Board" on December 14 and on the 28th there is no meeting. John Arrowsmith G4IWA on Atherstone 713670, will tell you more.

On November 26, the **Edgware & District RS** have SWR Topics, December 10 is a Junk Sale and January 14 is their AGM. All meetings take place on the 2nd and 4th Thursdays, in the Watling Community Centre, 145 Orange Hill Road, Burnt Oak, at 8pm. More information available from Ian Cope G4IUZ, on Hatfield 65707.

The **Winchester ARC** meet every 3rd Friday in Durngate House, Eastgate Street. They have a Christmas Party planned for December 18. More details from Dick Murray on Winchester 880605.

The **Colchester Radio Amateurs** meet in the Board Room, first floor "B" Block, Colchester Institute, Sheepen Road at 7.30pm. December 10 is a Film and Video Evening. Further information from G3FIJ on Colchester 851189.

There's a lot planned for all those at the **Sheffield ARC**, starting with Aerial Forum on November 30, Morse Forum on December 7, Pea and Pie Supper on the 14th. Rendezvous with G1JAJ on the 21st and to finish, Chrizzie Prezzie Swapshop on the 28th. The club meets every Monday at 8pm in the Firth Park Pavilion, Sheffield. Tuition for Morse Code and Radio Amateur's Exam takes place between 7 and 8pm. Details from Alan Pemberton on Sheffield 395287.

The **Fareham & District ARC** meet every Wednesday at 7.30pm (Morse Class from 6.30pm) in the Porchester Community Centre, Westlands Grove. December 2 is a talk entitled "Bobbins, Baluns and Beads" by G3CCB, the 16th is "Taking the Morse Test" by G3TZL. Contact G3CCB on Fareham 288139 for more details.

The **Bredhurst Receiving and Transmitting Society** meet every Thursday at 8pm in the Parkwood Community Centre, Deanwood Drive, Rainham, Gillingham. November 26 is a talk on "Regenerative Receivers" by G4EGH, December 3 is a Construction/Natter Night, the 10th is a talk on "Kathleen - how our girl is doing" by G3YCN and the 2nd Construction/Natter Night follows on the 17th. There will be no meetings on the 24th and 31st. More details from Kelvin Fay GOAMZ on Medway 376991.

December 9 is a Natter Night,

the 23rd is a Christmas Party, for all those involved with the **Trowbridge and District ARC**. The club meets alternate Wednesdays at 8pm in the Territorial Army Centre, Bythesea Road, Trowbridge. Ian Carter G0GRI on Devizes 6656 can tell you more.

The **Dunstable Downs RC** meet every Friday at 8pm in Chews House, 77 High Street South, Dunstable. On December 11 they have a Christmas TV Show via GB3TV, the 18th is a Christmas Party (members only) and there will be no meeting on the 25th. More details can be obtained from Tony GOCOQ on Luton 508259.

A Mini-lecture is planned for November 27 and December 11 is a Social evening for all those at the **Wimbledon & District ARS**. There is no meeting on December 25. The club meets on the 2nd and last Fridays of each month at 7.30pm in the St Andrews Church Hall, Herbert Road, Wimbledon. Enquiries concerning W&DARS activities to the new secretary David Love G4RBQ on Banstead 51559.

The **Mansfield ARS** meet on the 1st Friday and on 3rd Tuesday at 7.30pm in the Victoria Social Club, Mansfield. December 4 is the club's Christmas Party and the 15th is a talk by G8GNN on "The Oscilloscope". There will be no meeting on Friday 1 January. Keith Lawson G4AAH on Mansfield 642719 will tell you more.

**Wyre ARS** meet at the Breck Sports and Social Club, Breck Road, Poulton, in the 2nd and 4th Wednesdays of each month at 8pm. They have one event planned for December 11 which is the club's Annual Dinner (tickets £6.50 to £7). There will be no meeting on the 23rd. Contact Dave Westby on 854745 for more details.

On December 8, the **Keighley ARS** have an Informal Meeting planned. All meetings start at 8pm in the Victoria Hotel, Cavendish Street, Keighley. For any further details please contact Kathy G1IGH on Bradford 496222.

The ever popular Junk Sale is planned at the **Derby and District ARS** on December 2 and January 6. A Construction Contest is being held on December 9, Christmas Party on the 16th, no meeting on the 23rd and The Year in Retrospect on the 30th. All meetings are at 7.30pm at 119 Green Lane, Derby. More details from Jack Anthony G3KQF on Derby 772361.

Quite a busy month ahead for the **Yeovil ARC**, who meet every Thursday at 7.30pm in the Recreation Centre, Chilton Grove, Yeovil. December 3 is v.h.f. Propagation & Choosing a v.h.f. site by G3GC, the 10th is an outline of Broadcasting Studio techniques past & present by

G3FQO, a Natter Night follows on the 17th and the Christmas Party & Junk Sale follows on the 23rd. No official meeting on the 31st. Further details from David Bailey G1MNM on Yeovil 79804.

The **Chelmsford ARS** usually meet on the 1st Tuesday of each month at 7.30pm in the Marconi College, Arbour Lane, Chelmsford. A talk on Packet Radio has been arranged for December 1. For more details contact Roy G3PMX or Ela G6HKM on Chelmsford 360545 (home) and 353221 Ex. 3815 (office).

All lecture and social meetings for those connected with the **Felixstowe and District ARS** take place at 8pm, in the Scout Hut, Bath Road, Felixstowe. November 30 is the club's social and December 14th is Christmas drinks at the Grosvenor Hotel. There is no meeting on the 28th. Further details from Paul Whiting G4YQC on Ipswich 642595 (daytime).

Another full month ahead for those of you at the **South East Kent (YMCA) ARC**. December 2 is Natter Night, the 9th "How Can I Work Meteor Scatter" by G8VR, the 16th Christmas Social and January 6 is Natter Night. No meetings on the 23rd and 30th. Meetings are held on Wednesday evenings, and Instruction Classes in Morse or Radio Amateur Examination coaching are held at the Dover YMCA, Godwynehurst, Leyburne, Leyburne Road, Dover. On Monday and Tuesday evenings it is necessary to contact the club to enroll in instruction or coaching classes. For further information contact John Dobson on Dover 211638.

The **Loughton & District ARS** meet on the 2nd and 4th Fridays of each month, at 7.45pm in Loughton Hall (room 20). December 4 is G4ONP Night on the Air with 6 metres and a Christmas Meal at Ciro's Restaurant is planned for the 18th. No meeting on January 1, drinks at the Wheatsheaf at 8pm. More details from John Ray G8DZH, at 9 Albion Hill, Loughton IG10 4RA.

**Welwyn/Hatfield ARC** have an AGM on December 7. Main meetings are held at Lemsford Village Hall, Brocket Road, Lemsford on 1st Mondays. Their informal meetings are at 9th Welwyn Garden Scout HQ, Knightsfield on 3rd Mondays. Further details from Kevin Dunwell G4WLG on Welwyn Garden 335162.

Friday 18 December is Buffet/Dance Night at the RAFA Club, Penrith for all those at the **Eden Valley RS**. Meetings start at 7.30pm in the Ullswater Centre, Penrith or The Crown Hotel, Eamont Bridge, and usually take

place every 3rd Thursday. For further information contact Martin G4FUL on Penrith 66728.

**Cheltenham ARA** have their AGM on December 4. They meet in the Stanton Room, Charlton Kings Library, Cheltenham. More details from Tim Kirby on Cheltenham 36111 (ext 2259) during the day or 36723 in the evenings.

The **East Lancashire ARC** meetings are held twice a month at the Conservative Club, Cliff Street, Rishton. The 1st Tuesday being formal, the last Tuesday informal. Both start at 7.30pm. December 1 is their AGM. Further information available from Stuart Westall G6LXU, at 71 Rothesay Road, Blackburn, Lancashire BB1 2EN.

The **Rugby Amateur Transmitting Society** have their Annual Christmas Dinner on December 15, Christmas Mince Pie Evening on the 22nd and January 5 is New Years Natter Night. The Society meets every Tuesday at 7.30pm, in the Cricket Pavilion outside Rugby Radio Station. Kevin Marriot G8TWH, at 41 Foxon's Barn Road, Brownsover, Rugby CV21 1LA can tell you more.

Tuesday 15 December is the Christmas Social for those at the **Halifax and District ARS**. The club meets on the 1st and 3rd Tuesdays in the month at 7.30pm, in the Running Man Public House, Pellon Lane, Halifax. More details from David Moss on Halifax 202306.

On December 2, the **Cheshunt & District ARC** have a talk on Batteries by G3IGP, a Natter Night on the 9th and a Video Evening with Cheese and Wine on the 16th. There will be no meetings on the 23rd or 30th. They meet every Wednesday at 8pm, in the Church Room, Church Lane, Wormley. More details from John G4VMR or Terry Watkins G4VSL, on Dane End 250.

**Crystal Palace & District RC** meet at the All Saints Parish Rooms, Beulah Hill (opposite the IBA transmitting mast) on the 3rd Saturday of each month. December 19 is a Social Evening and January 16 is the Presentation of "Bronsoi Antenna Farm" by G3OLM. Geoff Stoffe G3FZL on Forest Hill 6940 will tell you anything else you may need to know.

The **Chester and District RS** meet at the Chester Rugby Union Football Club, Hare Lane, Vicars Cross at 8pm. Morse classes start at 7.15pm. A Construction Contest is to be held on December 15, a Christmas meeting on the 22nd and a Drink and Waffle night is planned for the 29th. Further details from Dave Hicks G6IFA on Chester 336639.

The **Farnborough and District RS** have a Christmas Social

Evening on December 9. There will be no meeting on the 23rd. The club meets in the Railway Enthusiasts Club, off Hawley Lane (along side M3 bridge) at 8.15pm on the 2nd and 4th Wednesdays in each month. More details available from Tim Fitzgerald on Camberley 29231.

**Bury RS** meet every Tuesday at the Mosses Centre, Cecil Street, Bury. Main meetings are on the 2nd Tuesdays, and other meetings are informal. December 8 is their AGM. Further details from C. Ashworth G1PKO on Bury 5018.

A talk on AX25 Packet Radio by G4BMK on December 7, followed by an AGM on January 4, are the events being held at the **Southdown ARS**. They usually meet on the 1st Mondays at the Chaseley Home for Disabled Ex-Servicemen, Southcliff, Bolsover Road, Eastbourne. Other meetings are held in the Clubrooms, Hailsham Leisure Centre, Vicarage Lane, Hailsham on Wednesdays and Fridays. All take place at 7.30pm. C. Evans G4VOS on Heathfield 3168 can tell you more.

**Torbay ARS** every Friday at 7.30pm, in the English China Clay Social Club, Highweak, near Newton Abbot. Saturday 12 December is their Christmas Party and a Contest/Construction night follows on January 23. Bob McCreadie G0FGX on Haytor 233, will give you more details.

The **Verulam ARC** meet on the 2nd and 4th Tuesdays of each month with the exception of December, when they shall meet on the 2nd and 3rd Tuesdays. They meet at the Royal Air Force Association HQ, New Kent Road (off Marlborough Road), St Albans. Tuesday 8 December is an Activity Evening and the 15th is their AGM. Special attention is drawn to the Club's third Annual Christmas Rally, at the City Hall, St Albans, on Sunday 6 December, from 11am to 5.30pm, admission £1. More from Hilary G4JKS on St Albans 59318.

A committee meeting is the first event planned this month at the **Sutton & Cheam RS** on December 1, 144MHz Fixed and AFS Contest on the 6th, a Natter Night follows on the 7th, Christmas Get Together on the 18th and another Natter Night on January 1. Meetings are normally held on the 3rd Fridays of each month at 7.30pm in the Downs Lawn Tennis Club, Holland Avenue, Cheam. Natter Nights are on the 1st Mondays in the Downs Bar. John Puttock G0BWV at 53 Alexandra Avenue, Sutton, will I'm sure be pleased to tell you any other details.

A club meeting on December 1 and an Annual Christmas Social Evening and Presentation of the Marcuse Trophy on the 15th, are

the two events planned for those at the **Chichester and District ARC**. Club meetings are held in St Pancras Hall, St Pancras, Chichester, on the 1st and 3rd Tuesdays of the month at 7.30pm. If you have any queries then the person to contact is C. Bryan G4EHG on Chichester 789587.

**Southgate ARC** usually meet at the Holy Trinity Church Hall (Upper), Green Lanes, Winchmore Hill at 7.45pm. Their AGM is on Thursday 10 December, with no meeting on the 24th. Further details from D. C. Elson G4YLL on Waltham Cross 30051.

The **South Bristol ARC** meet every Wednesday at the Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol. December 2 brings a Test Equipment Rally, the 9th is a club project - Discussion, the Christmas Party follows on the 16th and a VHF Activity Evening is on the 23rd. More from Len Baker G4RZY on Whitchurch 834282.

**Biggin Hill ARC** have a video on Amateur Radio in Space, as well as a Christmas Party on December 8. The club meets at the Victory Social Club, Kechill Gardens, Hayes. Geoffrey Milne G3UMI on Hayes 2689 can tell you more.

December 7 is the **Stourbridge ARS** Christmas Dinner, to be held at the Cottage Inn, High Street at 8pm. More details from Derek Pearson G3ZOM on Kingswinford 288900.

**Ipswich RC** meet in the upstairs room of the Rose and Crown, 77 Norwich Road, Ipswich, at 8pm on the 2nd and last Wednesdays in each month. They have a Quiz against Stowmarket Radio Amateurs on December 9 and their Christmas Ragchew on the 23rd. There will be no meeting on the 30th. For more information contact Jack Tootill G4IFF on Ipswich 464047.

On December 2, the **Banbury ARS** have a talk on Satellite Communications with a half hour Questions and Answers Forum on the RSGB by G4HLX, and on the 16th G4OCO talks about Packet Radio. There will be no meeting on the 30th. The Society meet at two week intervals, on Wednesday evenings in The Mill, SpiceBall Park, Banbury at 7.30pm. More details from Bryan Thornton G1IIO on Banbury 51774.

**Acton, Brentford & Chiswick ARC** meet at the Chiswick Town Hall, High Road, Chiswick at 7.30pm. On Tuesday 15 December they have a discussion on the RSGB Proposals for the Revision of the Amateur Licence. More information from W. Dyer G3GEH on Acton 3778.

The **Cornish ARC** have their Christmas Party on December 3 and Smith Charts by Simon Rodda on January 7. They meet in the Church Hall, Treleigh, on the Old



Redruth Bypass at 7.30pm. You can find out more by contacting N. Pascoe G4USB on Redruth 212314.

The **Sudbury and District Radio Amateurs** meet on the 1st Tuesday in any month, at 8pm, in the Saracens Head, Newton Green, Sudbury. More details from Colin Muddimer on Sudbury 77004.

A busy month ahead for all those belonging to the **Mid-Sussex ARS**. The Society meet every Thursday at 7.45pm in the Marle Place, Leylands Road, Burgess Hill. December 3 is an Operating Evening in the Club Shack, the 4th is the club's Annual Dinner, the 6th is 144MHz Fixed Station Contest, the 17th is an Informal Evening. The Club Shack is closed on the 24th and 31st. More details from Mike Mundy G0GNV on Burgess Hill 41407.

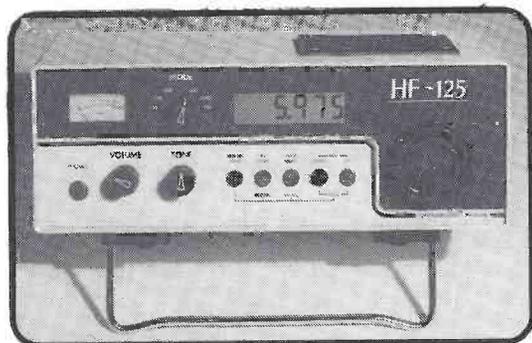
**Rhyl & District ARC** meet at The 2nd Rhyl Scout HQ (behind the little Theatre), Vale Road, Rhyl at 7.30pm. Packet Radio Demo by Roy and Alan is planned for December 7. Mike GWOHWK on 097888 621, can give you any other details.

**Derwentside ARC** meet in the Steel Club, Consett (opposite Bus Station) every Wednesday at 7.30pm. If you would like more details then contact David Plumridge G3KMG, at Rose Cottage, Castleside, Consett DH8 9AW.

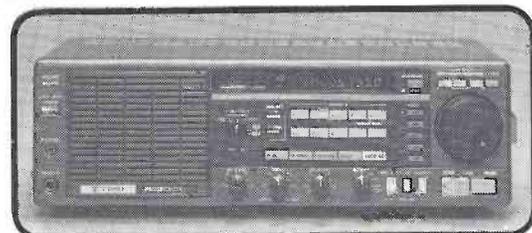
Gordon Hunter gives his regular Christmas Film Show on December 18 for the **Mid Lanark ARS**, and Scotrail Communications and control of trains throughout Scotland are explained in detail on January 8. The club meets in Wrangholm Hall, Community Centre, Jerviston Street, New Stevenson. More from David Williams GM1SSA, on Holytown 732403.

The **Radio Society of Harrow** usually meet every Friday at 8pm in the Harrow Arts Centre, High Road, Harrow Weald. November 27 is RAIBC and General RSGB matters by G3OSS, December 4 is Activity Night, and so is the 18th. No meeting on the 25th. The club's Chairman, Bob Pickles G3VCA on Ruislip 673287, will be glad to tell you more.

## SHORT WAVE RECEIVERS



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R2000



R5000



NRD525

		Price	Carriage
<b>HF125</b>	General coverage receiver made in Britain by Lowe Electronics, 30 kHz to 30 MHz	£375.00	£7.00
<b>Options</b>			
<b>K125</b>	Optional frequency entry keypad	£59.50	
<b>D125</b>	FM and synchronous AM detector	£59.50	
<b>P125</b>	Portable pack, includes internal nicads, charging system and active whip antenna	£69.50	
<b>R2000</b>	KENWOOD general coverage receiver 150 kHz to 30 MHz	£637.26	£7.00
<b>Options</b>			
<b>VC10</b>	VHF converter, adds 118 to 174 MHz	£170.76	£2.50
<b>YG455C</b>	500 Hz CW filter	£116.62	£1.00
<b>R5000</b>	KENWOOD general coverage receiver, 100 kHz to 30 MHz	£895.00	£7.00
<b>Options</b>			
<b>VC20</b>	VHF converter, adds 108 to 174 MHz	£176.32	£1.00
<b>YK88C</b>	500 Hz CW filter	£48.59	£1.00
<b>YK88CN</b>	270 Hz CW filter	£57.62	£1.00
<b>YK88SN</b>	1.8 kHz SSB filter	£49.29	£1.00
<b>YK88A1</b>	6 kHz AM filter	£50.88	£1.00
<b>SP430</b>	Matching speaker	£43.04	£2.50
<b>VS1</b>	Voice module	£34.02	£1.00
<b>NRD525</b>	JAPAN RADIO COMPANY general coverage receiver, 90 kHz to 34 MHz	£1195.00	£7.00
<b>Options</b>			
<b>CMK165</b>	Optional VHF/UHF Converter, adds 34-60, 114-174, 423-456 MHz	£391.35	£7.00
<b>CMH530</b>	Internally fitted RTTY demodulator	£102.19	£1.50
<b>CMH532</b>	Internally fitted RS232 interface	£91.75	£1.50
<b>CC232</b>	Cable for CMH532 interface	£60.25	£2.00
<b>CFL231</b>	300 Hz crystal filter	£126.37	£1.00
<b>CFL232</b>	500 Hz crystal filter	£126.37	£1.00
<b>CFL233</b>	1.0 kHz crystal filter	£126.37	£1.00
<b>NVA88</b>	Matching loud speaker	£62.86	£2.50

## DATA DECODING EQUIPMENT

(read RTTY, CW or AMTOR using a UHF television or monitor)

<b>CD600</b>	Decoder for CW/RTTY/TOR/AMTOR	£215.14	£7.00
<b>CD660</b>	Decoder for CW/RTTY/ASCII/TOR/AMTOR	£264.97	£7.00
<b>CD670</b>	As CD660 but with built-in dot matrix display	£327.77	£7.00

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(use your short wave receiver to listen to VHF/UHF signals, check with us before you buy that your receiver is suitable).

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<b>MMC14428</b>	2 metre converter, uses 10 metre IF	£37.95	£1.25
<b>MMC14428HP</b>	as MMC14428 but higher specification	£47.84	£1.25
<b>MMC43228S</b>	70 centimetre converter, uses 10 metre IF	£44.85	£1.25

## HEADPHONES

<b>HS7</b>	KENWOOD miniature head phones	£16.66	£1.00
<b>HS6</b>	KENWOOD lightweight headphones	£25.68	£2.00
<b>HS5</b>	KENWOOD de luxe headphones	£39.57	£2.00

## WORLD CLOCK

<b>CWTC</b>	CASIO world time clock	£15.95	£1.00
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# AIRBAND

Godfrey Manning

## Frequencies and Information Charts

With regret I am unable to advise readers as to the best equipment to purchase for any given purpose, although many of you have written requesting this kind of thing. One problem is that opinion on equipment is subject to individual preference and what suits me may not be what you like. Also, it's hard for one person to remain an up-to-date "walking catalogue" of receivers, etc. One such request is from **Bob Bell** (Blyth) who also notes dense traffic along a south-east/north-west path. I suggest that this is the UB13 (and possibly UR38) airway which passes the Newcastle v.o.r./d.m.e. (identity NEW: dah-dit, dit, di-dah-dah, 112.05MHz/Channel 57) and n.d.b. (same identity, 352kHz). See your Aerad chart H108 or Jeppesen 3E(HI). Airways traffic is always subject to control under instrument flight rules (i.f.r.) whatever the weather and does not communicate with a flight information region (f.i.r.) which only handles uncontrolled aircraft in an advisory capacity. Oceanic flights contact Shanwick first on v.h.f. and are then usually given a pair of h.f. channels on which to report during their passage within the north Atlantic track system. For frequencies again see the appropriate Aerad charts (which you say you've got) or Jeppesen AT(H/L) *Atlantic Orientation Chart*. I also recommend this latter chart to **D. R. Benfield** (Northampton).

Frequencies and nav-aid availability, etc. do change regularly and to find out up-to-the-minute information you need a NOTAM service. **Philip Lee** (Epsom) who has done a little gliding would like to know about this service. Your local airfield might carry NOTAMs (try the flying club or school); you can also take *Aviation News* fortnightly for its "Radio Watch" feature. Some large public libraries can also help with these NOTifications to AirMen and lastly the Civil Aviation Authority (CAA) publication *General Aviation Safety Information Leaflet* (monthly from CAA, Printing & Publication Services, Greville House, 37 Gratton Road, Cheltenham, Gloucestershire, GL50 2BN) contains a section on "VOR Changes". Philip is also trying to build a list of frequencies, but I think that the usual sources as often mentioned in this column are as good as any. One such is suggested by **Alan Jarvis** (Cardiff): 1 AIDU, RAF Northolt, West End Road, Ruislip, Middlesex, HA4 6NG sells charts, *En Route Supplements*, etc. Do remember the good-sized stamped/addressed envelope when sending for price lists. Alan helps previous readers who wanted to know the locations of London air-traffic control ground relay stations: some of them are at Davidstow Moor, Birdlip and Clee Hill.

## Military News

The military low flying system interests

When will pilots (and their radios) become redundant? Yours truly flew on his holidays by Boeing 767 and found it to be all computerised "in the office" up front! Very disconcerting was the navigation receiver's habit of tuning whatever nearby beacon it liked in order to allow automatic validation of the computerised inertial reference system's current position. This pre-programmed frequency need not be one of the beacons mentioned in the flight plan!

**Alan Duckers** (Merseyside). As you rightly say, Alan, this type of flying does not take place in congested terminal areas but is dense over certain parts of the country where there are fewer conflicts. True combat flying would entail doing 600kts at less than 125ft above the surface but the aircraft that you actually see are strictly limited to remain at least 250ft from the nearest object (including the surface) and not to exceed 450kts (which I take to be indicated air speed, i.a.s.). Last year I attended a meeting at which the RAF presented their case for low flying training and an assurance was given that the route and timing of these flights is random apart from being restricted to 0700-2300 hrs weekdays. Apart from this, Alan mentions the new Doppler v.o.r. beacon near him at Wallasey (WAL: di-dah-dah, di-dah, di-dah-di-dit, 114.1MHz). Could some reader please enlighten the rest of us as to the difference between this type of v.o.r. and the conventional variety as described in part 2 of my "Aeronautical Radio" series? Apparently some light aircraft v.o.r. receivers do not work properly with these Doppler beacons (according to *Aeronautical Information Circular 75/1986* published by the CAA). My three part series ran in May, June and July this year so if like **Roy Taylor G1LPG** (Wembley) you missed it, please write to the Editor for the price of back numbers (sorry I can't send any myself).

**Clive Hextall G1HVN** (Leicester) is interested in the military u.h.f. allocation. Last month I mentioned the adoption of narrower channel spacing; in fact, it appears that what actually happened was that on 23rd August the NATO countries went on to 25kHz channels and many existing frequencies changed (example: the Northolt automatic terminal information service, a.t.i.s., is now on 268.9MHz and its operational hours are 0800-2000GMT). Not all aircraft have this narrower channel capability yet, though.

## Callsigns

"How do the airlines announce themselves to the controller" asks **Ian Baxter** (Blackburn). Well, they all have agreed callsigns which usually include the flight number. "Speedbird 123" is British Airways flight 123 (in the old days, that would have been BOAC since BEA used the "Beeline" callsign). Some British Airways and British Airtours ("Beetours") flights have a strange allocation of callsign (e.g. "Shuttle 9 Uniform" was one flight on which I came home to Heathrow from a trip to Edinburgh). "Olympic" is the Greek national flag carrier, and "SABENA" (acronym for: *Société Anonyme Belge d'Exploitation de la Navigation Aérienne*) likewise for Belgium. **D. R. Benfield** points out that "Airforce 1" is the United States aircraft carrying the President. While on the subject of dignitaries, a "purple airway" is a temporary restriction to protect a royal flight.

Confusion over "all those numbers" required to explain an aircraft's position is not surprising, **Joseph Grogan** (Belfast). It seems that nearly everything that pilots routinely say is numeric! There are: flight number, altitude (feet) along with barometric pressure setting (millibars), heading (degrees), speed (knots), frequencies, "squawk" numbers and times. Not to mention weather reports of wind speed and direction, visual range, cloud cover at different heights, temperature and dew point, and barometric pressure. There may be a runway number thrown in for good measure! If you took the radio endorsement for the private pilot's licence (p.p.l.) you'd be expected to use "by the book" procedure leaving no doubt as to exactly which number was being mentioned at any given moment. Unfortunately experienced pilots tend to abridge their reports in the real world of busy control frequencies. If any particular terminology is causing confusion then I will attempt to explain it in this column if you write to me. When you start your interest in flying, information on aircraft position can be found by consulting the radio navigation charts (as mentioned in various recent "Airbands"), and frequencies are listed in the *Aerad Europe Supplement Volume 1*.

I won't easily forget my mistake about the Decca system. **Chris Kirby** (York) reminds me that the frequencies used are in the range 70-130kHz. Chain 5B is the English one, based on a frequency (f) of 14.1667kHz. The master frequencies are all 6f (85kHz) with the red slave on 8f (113.3kHz), green slave on 9f (127.5kHz), and purple slave on 5f (70.8kHz).

Can anyone tell **David Edwardson** (Wallsend, Tyne & Weir) the locations of the VOLMET transmission antennas? There are several around the country, all on the same nominal frequency but in actual fact slightly staggered by a few hundred Hz so as to reduce mutual co-channel interference. Another

controversy is the meaning of VOLMET: one reader puts forward the alternative view that the "Vol" is from the French *Voler*, to fly. David is near RAF Boulmer which controls Border Radar (132.9MHz) which may also explain a query by **G. R. Foster** (Southampton) who wants to know where Boulmer is.

## Heathrow Procedures

The approaches to Heathrow interest **Bill Montague** (Hornchurch) who lives under the Lambourne hold (actually based over the v.o.r. LAM: di-dah-di-dit, di-dah, dah-dah, 116.9MHz). The other three holds are over the v.o.r.s at Bovingdon (BNN: dah-di-di-dit, dah-dit, dah-dit, 112.3MHz), Ockham (OCK: dah-dah-dah, dah-di-dah-dit, dah-di-dah, 115.3MHz) and Biggin Hill (BIG: dah-di-di-dit, di-dit, dah-dah-dit, 115.1MHz). Holding patterns are race-track shapes stacked at 1000ft intervals over the beacons. The two main runways are parallel 27 left/right (09 right/left if running in the opposite direction). Unless single runway operation is in use, aircraft land on one of the runways and take off on the other parallel one in the same direction (always in to wind unless it is light, say less than 5kts). **Chris Cotton** lives in Battersea, under the final 27 approach. The only reason that I can think of for the last-minute change that Chris sometimes observes when certain larger aircraft switch from 27R to 27L is that having landed, taxiing to terminal 4 will be quicker and it would not be necessary to cross over the other runway. All Heathrow taxiways and runways are divided into numbered blocks and the pilots report their position to ground movement control on 121.9MHz by reference to these. As a passenger you may see the yellow boards which carry two numbers separated by a bold vertical line: these are at the boundary of two blocks, the left-hand number is the block that you are leaving and the right-hand number is the block entered. For quick taxiing to terminal 4, aircraft that have touched down on 27L would need to reduce speed sufficiently to be able to vacate the runway to the left at block 83. Bill uses aerodrome let-down charts from the CAA but the Aerad ones are more compact and sometimes cheaper. You can see the block number layout from these.

Both Bill and Chris are interested in the instrument landing system (i.l.s.) and for details I would refer you both to part 3 of my "Aeronautical Radio" series (July *SWM*). Category I weather minima relate to cloud base and runway visual range suitable for a manual landing, having reached a decision height of around 200ft depending on aircraft type and runway situation (minimum decision height, m.d.h., now supersedes the old decision height but allows for more factors). Cat II refers to bad weather where the decision height might be only 100ft. The aircraft

equipment capable of flying this is more sophisticated than Cat I, for example at least two autopilots are needed. Cat III requires fully automatic landing although IIIa would give a view of the runway lights just on the flare, IIIb only when in the landing roll and IIIc doesn't even allow visual taxiing! For takeoff, the runway is kept clear of other aircraft or vehicles by the controller and then the pilot need only see a couple of lights ahead at any given time so as to maintain a straight path along the runway centre-line. At the moment of rotation, the instruments would normally be used alone anyway.

However, just as with any radio equipment, i.l.s. can't be guaranteed to remain accurate without regular maintenance. The radiation patterns of the localiser and glide-slope beams are all important. The CAA flying unit (based at Stansted) operate the H S 748-2A G-AVXI seen by Chris. This makes repeated i.l.s. runs, breaking off to go-around at the last minute, and calibrating its flight path against ground-based equipment. They used to do this with a theodolite but I gather that it's more scientific now (something involving lasers?). It's a demanding job for the pilot — not just one i.l.s. approach at the end of a flight, but many rapid repeated ones, all to be flown with superb accuracy without loss of concentration! But it is bound to get in the way of the routine traffic which doesn't stop just because the calibrator is flying about. Recently I saw this happening at Luton whilst the 26 i.l.s. was being calibrated. The trouble was, 08 was the active runway! During this time, the i.l.s. often identifies itself as TST: dah, di-di-dit, dah; it should not be used for navigational purposes when under test. The RAF have their own calibration aircraft. Luton I regard as my local airport; well worth a visit since the spectators' car park is right next to the main taxiway! Many first officers have learnt to wave to the assembled crowds of enthusiasts whilst taxiing on to the apron after landing.

More museums: **R. M. Lyddon** (South Glamorgan) mentions those at Cardiff airport and (1st Sunday in the month only) St. Athan. He would also like to know the power used by the transmitters or aircraft and ground stations: can anyone help? The e.r.p. from aircraft antennas can often be quite low in relation to transmitter output power (see "Book Review", *Radio Communication* October 1987 p.747). For the information you ask about the Selcal system try *High in the Sky* by Ken Barker from The Aviation Hobby Shop, Spectator Terrace, Manchester Airport, Wythenshawe, Manchester, at £3.25 inclusive of postage.

According to **John Davies** this book also includes useful frequency and fly-over time information. John adds that the Shanwick controllers are based at Shannon along with the transmitters and that only the computer systems are located at Prestwick.

An old friend is **Rolf Vogel** (Menorca, Spain) who has all but completed his private pilot's licence. His problem is that all radio procedure is in Spanish! So he has to return to Germany to take an English language radio test . . . complicated. A tip he suggests is as follows. Establish and fly along any v.o.r. radial away from the facility, then turn 45° off heading. Time (in seconds) from this turn until crossing the next radial that is separated by 10° from the original one. Divide this time by 10 and the resulting number is actually how many minutes it would now take to fly direct to the beacon. Unfortunately I found this to be out by 50 per cent based on simple trigonometry: can anyone help? Rolf's other interest is sub aqua diving and this can interact disastrously with flying. The pressure in the cabin of an airliner is equivalent to that 2100m up a mountain. Some holidaymakers have been known to go on a trial diving lesson and then fly home a few hours later; the reduced cabin pressure promptly causes the bends! An interval of 24hrs is needed between diving and flying. Remember that the Commander will have to divert his aircraft for an emergency landing in the event of a passenger falling ill, and the safety interests of that one person must be balanced against those for the aircraft complement as a whole. A difficult decision, and not one likely to be popular if the illness is effectively self-induced.

The radio-nav facilities near his Cardiff home are puzzling **George Jacob**. It isn't really possible to correlate airway colour designation and direction; amber 25 runs over you leaving Berry Head (BHD: dah-di-di-dit, di-di-di-dit, dah-di-dit, 112.7MHz v.o.r. and 318kHz n.d.b.) on 013° and going to Brecon (BCN: dah-di-di-dit, dah-di-dah-dit, dah-dit, 116.3MHz). See chart Aerad EUR 1/2 or Jeppesen E(LO) 1/2.

The runway (10/28) at the London (City) "STOLport" will be operational by the time you read this. There's an n.d.b. (LCY: di-dah-di-dit, dah-di-dah-dit, dah-di-dah-dah, 322kHz) and a terminal d.m.e. which is presumably i.l.s. coupled as it is accessed by tuning the nav set to 111.15MHz. Air-traffic control is by Thames Radar on 132.7MHz.

Others of you who have written in will be interested in your local facilities. **Richard Carrick** (Huddersfield) will find himself at a real "crossroads in the sky" near the Pole Hill v.o.r. (POL: di-dah-dah-dit, dah-dah-dah, di-dah-di-dit, 112.1MHz). Most of the airways traffic routing north-south along the west coast passes here. An old hand from the days of Hunters and Shackletons is **P. Farmer** (Dyfed) who will be under a direct track leaving Strumble (STU: di-di-dit, dah, di-di-dah, 113.1MHz v.o.r. 400kHz n.d.b.) on 087° towards Honiley (HON: di-di-di-dit, dah-dah-dah, dah-dit, 112.9MHz). **Michael Ellard** (Cork) is near a major intersection at the Cork v.o.r. (CRK: dah-

# UNIDEN BEARCAT UBC 175XL

John Waite

The Uniden Bearcat UBC 175XL is a very attractive base station v.h.f./u.h.f. scanner with nine-band coverage of the spectrum between 66 and 512MHz. Any frequency within these bands can be stored in one of the 16 memories for later retrieval. Also incorporated are search, scan and a host of other useful facilities. The rather attractive simulated wood finish makes this receiver particularly appropriate for those without the advantage of a separate shack for the radio equipment, as few people would find it "offensive" to look at. In fact, it probably matches many hi-fi tuners and cabinets already in many living rooms!

## Operation

Connecting up the UBC 175XL is very easy. The unit comes complete with an a.c. adapter, which is a plug-top mounted unit with a two-pin connection to the mains outlet. The only point to note here is that a good quality fused 13A to two-pin adapter will be required in order to provide adequate protection and physical support for the adaptor. The d.c. output of the a.c. adaptor is connected to the scanner by a 1.8m lead and a standard power jack on the rear panel.

The antenna connection is made via a car radio type coaxial socket on the rear panel, this seems a strange choice of socket for a scanner covering up to 512MHz. The UBC 175XL is supplied with a 520mm telescopic antenna which plugs into the antenna socket. This type of antenna doesn't perform very well and to realise the full potential of the receiver any prospective purchaser would be wise to invest in an externally mounted discone antenna. That doesn't mean to say that the scanner gives poor results with the supplied antenna, far from it. The only other connection on the rear panel is for an external speaker, though the sound quality from the internal speaker is very good.

The UBC 175XL is equipped with a good range of features designed to ease the life of the listener. The key-pad has been separated into two distinct groups. The first group comprises the program keys which allow direct entry of frequency, channel number and search limits. The second group of keys are used to select the facilities of the UBC 175XL. The frequency and current mode is displayed on a rather pleasant back-lit liquid crystal display (l.c.d.) which is set at an ideal angle for viewing.

One of the first jobs, after switch-on, is to enter some of your favourite frequencies into the memories. This is very simple. You just enter the required channel number, press the MANUAL key to indicate that you want to set up the channel and then type in the required frequency followed by the E (enter) button. I found this a pleasant change from the scanners which require very

**Do you need a base station scanner? If so the Uniden Bearcat UBC 175XL reviewed here could be just what you've been waiting for.**



careful reading of the handbook before attempting any type of operation.

Another useful feature is the scanner adds the trailing zeros for you. If, for example, you want to enter 145.000MHz, you only need to enter 145, followed by the enter key. The trailing zeros are automatically entered.

Once a selection of your favourite frequencies have been entered they can be scanned by pressing the SCAN button, whereupon the display will blank, except for the channel number. The scan is stopped either by the presence of a signal exceeding the squelch threshold or by pressing the manual button. The blanking of the frequency display during scanning highlights the thought that has gone into making this scanner as easy to use as possible, at least you know what the scanner is doing.

A common problem with scanners is finding a suitable setting for the squelch control. On the UBC 175XL it can be switched to auto which selects a factory preset squelch level. I found that this preset level proved to be just about optimum for general listening and was used extensively during the review period.

When operating in scan mode, the receiver normally operates with a very fast scan rate of 15 channels per second, but this can be set to an alternative rate of 5 channels per second if required. The high scan speed is a very useful feature as it means, fairly obviously, that every channel is monitored in just over a second consequently you are unlikely to miss any of the action! Even at that speed it doesn't take much to stop the scanner either. So, if your favourite frequencies are ones that only have short bursts of signal in long periods of silence, then the 15 channels per second scan rate will be very useful for you.

If you get problems with a carrier on one or more channels, then this can be easily

overcome using the LOCKOUT facility. This is enabled or disabled very easily by pressing the LOCKOUT button whilst tuned to the offending channel. You have no idea how useful this facility is, until you are troubled by an annoyingly constant signal, then it is worth its weight in gold!

A common problem when listening with a scanner is that when tuned to a two-way communications channel the scan will re-start in the gap between transmissions. On the UBC 175XL this problem is overcome using the DELAY facility which forces the scanner to wait for 3 seconds before recommencing the scan. The facility can be enabled on any channel and is activated by pressing the DELAY button whilst tuned to the required channel. This allowed me to monitor amateur repeaters quite successfully, even those with long gaps between the hand-overs.

There is a priority channel feature on the UBC 175XL, it forces the scanner to monitor channel one every three seconds regardless of whether the scan has already stopped on another channel. The obvious use is to monitor your favourite frequency whatever that may be. It's the PRI button which starts and stops this function, but don't forget it's only active on channel one so be careful about which frequency you put in there.

It's often useful to be able to examine a segment of the spectrum in order to discover new frequencies of interest. This facility is available in the form of a search which operates between any two frequencies in any one band. The actual band limits are as follows: 66-88MHz, 118-136MHz, 136-174MHz and 406-512MHz.

To enable a search, the limits must first be entered, this is a very straightforward operation. First the required channel is selected as described earlier and the first search limit is entered followed by the LIMIT button instead of the E button. The second limit frequency is then entered in the same manner. One helpful point is that the limit frequencies can be entered in any order as the scanner sorts out which is the high and low limit. Although you have to select one of the scan memories for the search routine, the contents of the memory

# UNIDEN BEARCAT UBC 175XL

remain intact which is good but it's not made very clear in the manual. Once the limits of the search have been set the search is started by pressing the SRCH button on the front panel. The search is continuous and when the high limit is reached it resets to the low limit and starts again. I found the continuous search very useful as you can sit back and let the scanner do all the work and just make a note of any interesting stations that are revealed.

When searching a band the UBC 175XL actually tunes in discrete steps, the step size is determined by the band being searched as follows:

66-88MHz & 406-512MHz	12.5kHz steps
118-136MHz	25kHz steps
136-174MHz	5kHz steps

Although it's not mentioned in the manual, the SPEED button actually works when in search mode which is very useful. The two search speeds available appear to be approximately 15 or 5 steps per second. I found that, as when in scan mode, the very fast search rate is extremely useful as you can very quickly check a wide range of frequencies.

Once you have found an interesting transmission you can stop the search by pressing the HOLD button, if nothing else this gives you time to make a note of the frequency for entry into one of the sixteen scan memories. One notable feature available in search mode is the ability to manually step either up or down in frequency one step at a time. This manual search can be started at any time while in search mode by pressing the HOLD button, to step up in frequency press the HOLD button again and to step down press the LIMIT button. I thought that this was a very useful feature as a lot of scanners only allow you to step up in frequency. If you only discover one interesting frequency then the UBC 175XL has a handy short-cut to move the frequency into a scan memory. You first press HOLD to stop the search and then simply press E to move the frequency into the displayed memory channel, I thought this was very quick and easy to use. Finally, if the search stops on a steady carrier a press of the SRCH button will recommence the search from where it stopped, which proved to be very useful. As is common with most scanners, there is no facility to lock-out frequencies when in search mode.

One facility not mentioned so far is the weather channels, this scans between 162.2MHz and 162.550MHz in seven 25kHz steps. The scan is started by pressing the WX button and then continues in the same manner as a normal scan. This feature is of little use in the UK as the frequencies scanned are for the NOAA satellite which is not always easily received in the UK.

## Circuit Description

The UBC 175XL is a complicated receiver using 24 transistors, 5 integrated circuits

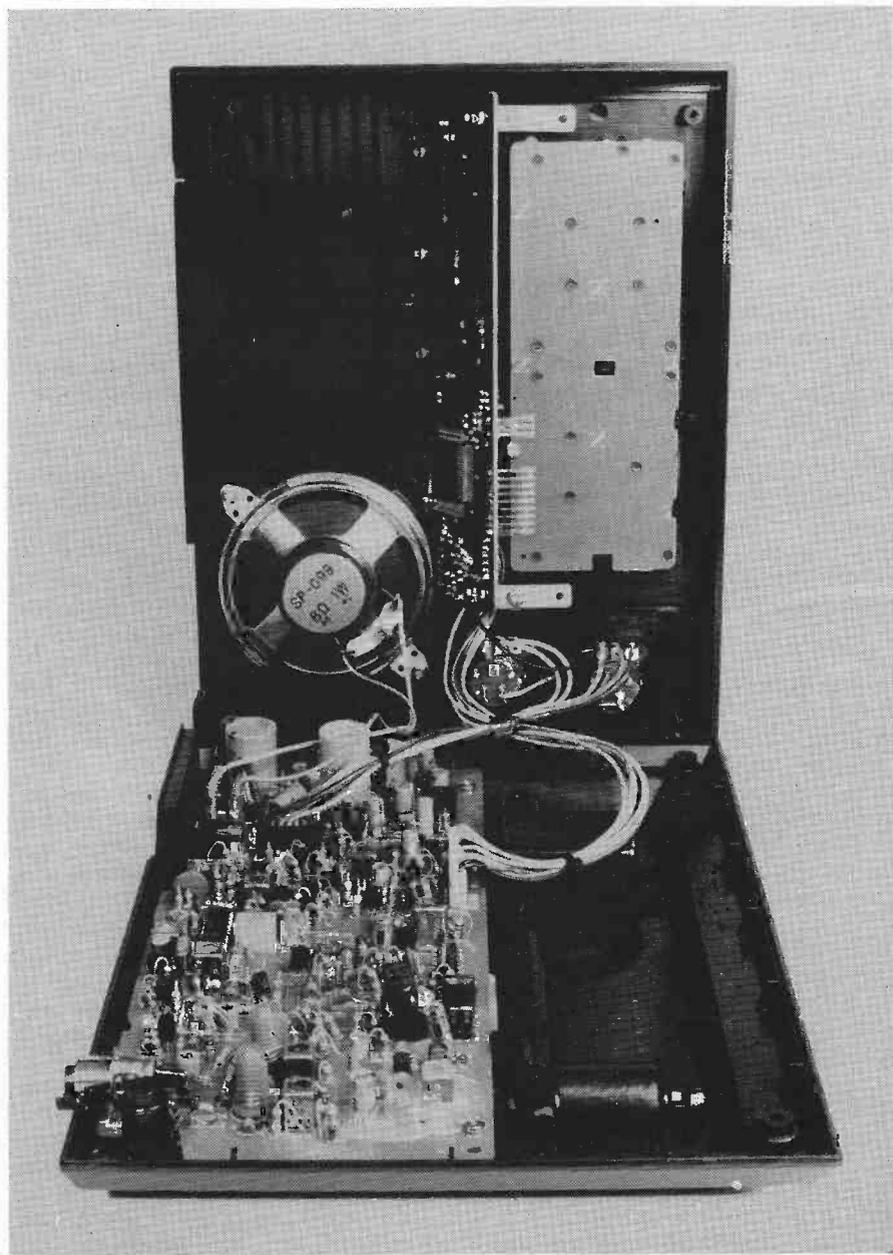
and 53 diodes, so I will attempt to simplify the circuit description as much as possible.

The signal from the antenna socket is fed to two separate r.f. amplifiers and mixers. The first deals with all signals below 400MHz and comprises a m.o.s.f.e.t. r.f. amplifier followed by a dual gate m.o.s.f.e.t. mixer. The path for signals above 400MHz is similar except that the r.f. amplifier and mixer stages use bipolar transistors. The outputs of both mixers are transformer coupled to a 10.85MHz crystal filter. The resultant 10.85MHz i.f. is then fed to a single stage i.f. amplifier before being coupled to an MC3359P f.m. receiver integrated circuit. The MC3359P contains the 2nd mixer, i.f. amplifier, noise amplifier and squelch circuit. After being filtered by a ceramic filter, the 450kHz output of the 2nd mixer is split between the f.m. i.f. amplifier and the a.m. i.f. amplifier. To enable automatic switching between a.m. and f.m. the recovered audio signal from the two

detectors is applied to an electronic switch before being fed to a buffer amplifier. The final audio amplification to 1 watt is achieved using a TDA1905 power amplifier.

The generation of local oscillator frequencies is controlled by the microprocessor and uses a phase locked loop system. The frequency reference for the system is a 10.4MHz crystal which also doubles as the second local oscillator. A two transistor v.c.o. (voltage controlled oscillator) produces the first local oscillator signal which is fed to the mixer via two cascaded buffer amplifiers. In order to cope with the large frequency span, the oscillator output is fed via a tripler when the u.h.f. band is selected.

The d.c. output from the plug-top power unit is fed via a series diode to provide reverse polarity protection. An integrated circuit voltage regulator provides the main 8 volt supply for the receiver, whilst several other voltages are regulated using Zener diodes.



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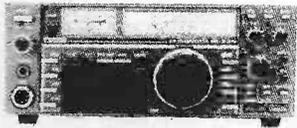
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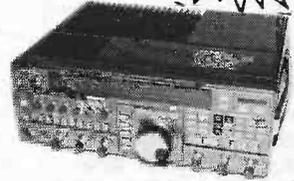
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### PORTABLES

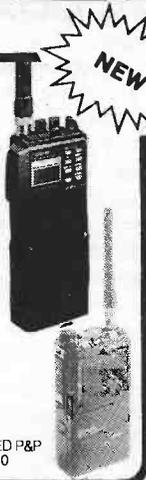
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# UNIDEN BEARCAT UBC 175XL

## Performance

I have been able to assess the performance of the UBC 175XL over several months of use. My first impression was of a very well laid out attractive scanner. The initial eagerness to get on the air resulted in rather poorer results than expected. These initial problems were due to the supplied telescopic antenna which is really not suitable as a general coverage antenna over the range 66-512MHz!

I thought that the programming of the scanning memories had been made very simple and easy to use which is a big plus point. The only snag with the memories is that the contents are only held for about 4 hours after removing the power. The reason for this is that instead of a battery back-up system the UBC 175XL uses the energy stored in a capacitor to power the memory after the power is removed. I think that most users would prefer a battery back-up system, even if it does mean an occasional battery change. Despite the back-up problems the 16 memories can be very quickly re-programmed so perhaps it's not too bad a problem.

The very fast scan rate of 15 channels or steps per second was very useful and made it very easy to make full use of the sixteen channels. One other feature that proved to be very useful in normal

operation was the automatic squelch, this saved all the normal delicate twiddling of the squelch control in an effort to find the optimum setting. The factory setting for automatic squelch was just right.

The technical performance of the scanner was evaluated in the *SWM* lab. and the results can be seen in brackets in the specification chart. The scanner actually put up a very good performance and exceeded the manufacturer's specification on all counts. The r.f. sensitivity was particularly good and was very well controlled throughout each band. The maximum variation across a band was  $0.08\mu\text{V}$  which is very good for such a wide-band receiver. The audio response  $-6\text{dB}$  points were at 250Hz and 2kHz which proved to be a good match for the internal speaker. The audio quality, though not perhaps ideal for communications, was very comfortable to listen to over extended periods.

To summarise, the UBC 175XL is a very attractive scanner that achieves a welcome simplicity of operation without compromising the technical performance.

The Uniden Bearcat UBC 175XL is priced £179.99 inc VAT and is available from *Uniden UK Limited, Uniden House, East Portway, Andover, Hampshire SP10 3LX*. Thanks to Uniden UK Limited for the loan of the review model.

## Specification

### Frequency Coverage:

66-88MHz in 12.5kHz steps  
118-136MHz in 25kHz steps  
136-174MHz in 5kHz steps  
406-512MHz in 12.5kHz steps

### Channel Capacity: 16

### Sensitivity:

$0.3\mu\text{V}$  ( $0.24\mu\text{V}$ ) 66-88MHz and 136-174MHz  
 $0.5\mu\text{V}$  ( $0.42\mu\text{V}$ ) 406-512MHz  
The above for 12dB SINAD with  $\pm 3\text{kHz}$  deviation  
 $0.8\mu\text{V}$  ( $0.6\mu\text{V}$ ) 118-136MHz  
The above for 12dB SINAD with 60% modulation

**I.F. Selectivity:**  $-55\text{dB}$  ( $-59\text{dB}$ ) @  $\pm 25\text{kHz}$

**Audio Output:** 1W (1.1W),  $8\Omega$  10% t.h.d.

**Size:** 240mm wide, 62mm high, 180mm deep

**Weight:** 740g

The figures in brackets are the measured results.

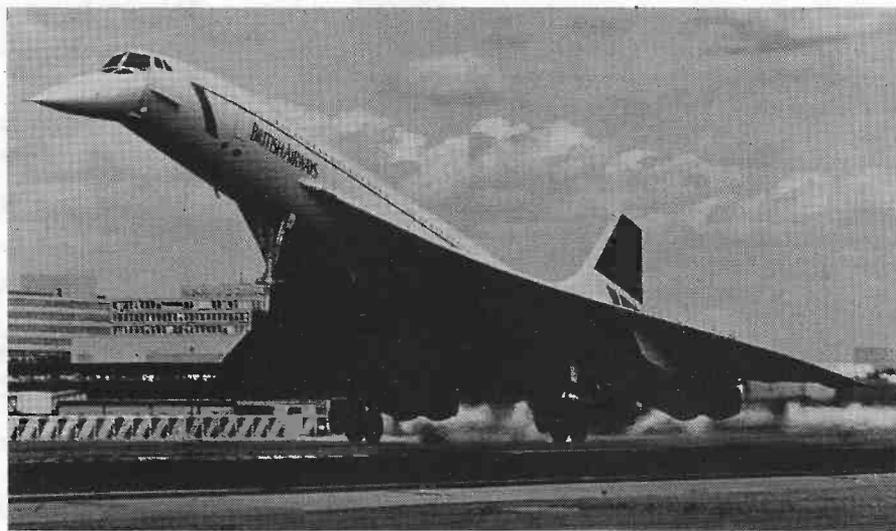
## AIRBAND

<10

di-dah-dit, di-dah-dit, dah-di-dah, 114.6MHz). I'm surprised that you report a lack of traffic here, Michael; you are also near Waterford airport which is relatively busy. **J. M. Gooding** (Essex) is close to Southend airport and airway red 1 south (RIS) which should give you plenty of interest. Another near-airport dweller is **Gordon Gipson** (Newcastle-upon-Tyne).

### Company Frequencies

My attention is drawn to the company frequency allocations on v.h.f. by **Colin Sumner** (Rainham). Typical information passed between aircraft and base will be time off blocks/or take-off (in GMT of course, with the "/" being spoken as "diagonal"); number of passengers as adults occupying seats + number of babes-in-arms; and any engineering messages. So often aircraft develop or fly with small defects which are no problem unless they infringe the minimum equipment list for that operation. It might not matter, for example, if the captain's seat will not slide back and forth on its rails provided that the position in which it has jammed is acceptable in order for the pilot to reach the controls correctly. About 20mins prior to arrival a company call might also be made which could include estimated arrival time, fuel burn-off and required uplift (probably in kilos), and



other needs such as wheelchairs or someone to meet unaccompanied minors. Talking of companies, one recently advertised in the national press for cabin crew who not only had to have a suitable personality for the job but were expected to be able to swim! Confidence not inspired.

Colin also asks about helical antennas. These are fitted to many handheld equipments (never to aircraft) and are physically short in relation to the wavelength in use. They also therefore have

reduced gain. There is however a voltage maximum at the free end, which is dangerous if brought near to the eyes whilst transmitting.

Thanks to one and all for writing; please keep your observations coming in. I'm sorry that with my volume of mail I am unable to answer individual letters directly, but I'll try to solve technical problems in this column. If I don't know the answer myself, maybe someone else out there does! I wish you all season's greetings until we meet next month.

# INTRODUCTION TO DX-TV

Keith Hamer and Garry Smith

## Part 5

Distant stations may provide a clearer picture under "disturbed conditions". You may even discover transmissions from Belgium, West Germany or the Netherlands.

### Tropospheric Propagation

This is probably the easiest propagation mode for the newcomer to DX-TV reception to experiment with. Normally a run-of-the-mill u.h.f. receiver can be used to pick up signals from the Continent provided the antenna is pointing in the right direction. Reception is generally associated with anticyclonic (or high-pressure) weather conditions and can occur from semi-local transmitters or any located up to around 1600km away. Generally, frequencies above 70MHz are affected which means that the u.h.f. and Band III television broadcast bands are the most likely to produce DX reception. Signals in Band I are less influenced by tropospheric propagation although reception does occur, usually on the "E" channels.

### For the Record

Just for the record, the most commonly received Band I tropo signal in the UK originates from the Lopik transmitter on channel E4 which is located in the Netherlands. This is closely followed by the Belgian Liège outlet on Channel E3 which radiates RTBF-1 programmes in the French language.

The f.m. radio band between 88 and 108MHz can also become increasingly active due to the effects of enhanced tropospheric conditions.

### High Pressure

The troposphere extends from the surface of the earth up to around 7600m and within it atmospheric pressures vary in different areas. From time to time, slow moving areas of above normal pressure can occur. These are termed anticyclones. Clear blue skies by day and clear, but cold, nights are often associated with high-pressure systems. Sometimes a high-pressure area can exist together with a low-pressure zone which leads to weather normally associated with winter. Incidentally, don't overlook the humble barometer which you may have hanging on the wall at home. Monitoring any increase in atmospheric pressure may well pay off as it will provide a good indication to possible DX-TV reception via improved tropo conditions.

Unlike Sporadic-E reception, there is no set "season" as such. Enhanced tropospheric reception conditions can and do occur at any time of the year. However, there is a tendency for these conditions to arise during the months of September and October when periods of settled weather are fairly common.

During periods of anticyclonic weather conditions, the earth warms up in the daytime due to the lack of cloud layer. For the

**The next time your picture is rolling and the caption "Continental Interference — Do not adjust your set" appears, instead of switching off, twiddle with your tuner. You could be surprised.**

same reason, the heat built up escapes quickly during the evening. This heating and cooling process results in temperature inversions which often lead to the formation of "waveguides". These are capable of directing signals at frequencies typically above 70MHz.

Reception under tropospheric-propagation mode conditions tends to be more favourable when in a path parallel to the isobars featured on weather maps. Isobars

are lines connecting points of equal atmospheric pressure.

### Fog Helps

The presence of widespread fog is another indication that reception via the troposphere may be enhanced. Conditions tend to favour the early morning and late evening but a noticeable fall-off occurs as the sun warms the lower troposphere.

Under the conditions described so far, long-distance signals can sometimes last for several days at a time. Indeed, conditions have been known to last for almost a fortnight.

### Tropospheric Ducting

Towards the end of a DX opening, as the high-pressure system is moving away, a ducting effect can occur along its trailing edge. Occasionally, tropospheric ducting

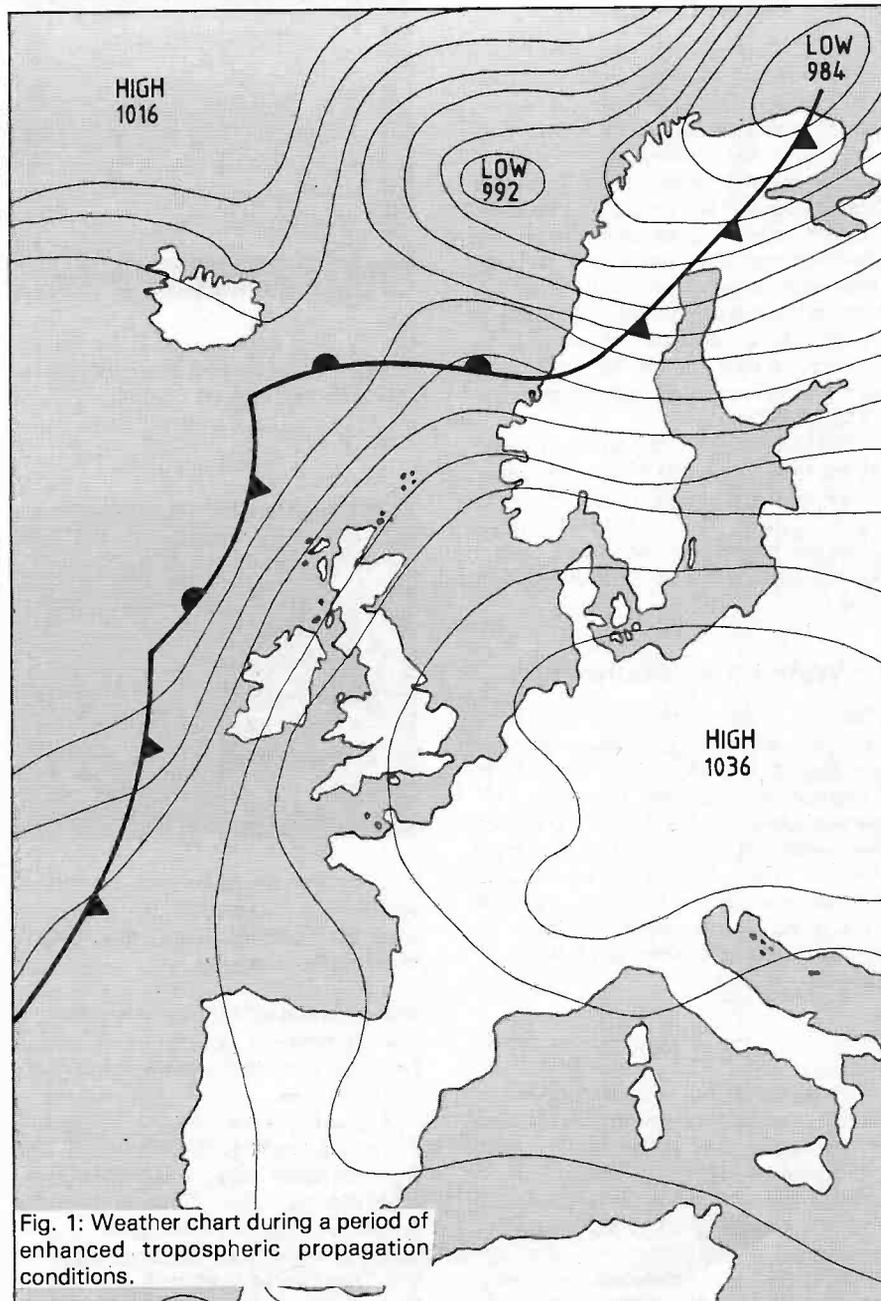


Fig. 1: Weather chart during a period of enhanced tropospheric propagation conditions.

# INTRODUCTION TO DX-TV

will propagate distant stations but not those at close range. Also, only a small range of frequencies rather than the whole of the band may be affected. A typical example of this is occurs when certain Swiss u.h.f. transmitters have been received in the UK between channels 30 and 40 with virtually no results from other stations along the reception path. Sometimes a fast-moving weather system can produce the right conditions for ducting to occur. The leading or trailing edge of the high-pressure system can be responsible in such cases. This particular form of short-lived tropospheric ducting, sometimes lasting less than an hour, has been experienced by a number of vigilant DX enthusiasts over the years. Needless to say, enthusiasm, patience and a lot of luck has probably helped!

## Super Reception

A cold or occluded front at the boundary of the high-pressure region can increase the range of TV signals even further. A classic example occurred in October 1975 when an exceptionally intense and prolonged opening towards the UK permitted the reception of signals transmitted some 1200km away. Russian u.h.f. signals were detected during the period and although they were relatively weak by comparison with closer transmissions, it proved just what was possible under exceptional circumstances. A repeat of these conditions occurred as recently as October 1985.

The illustration in Fig. 1, kindly supplied by the Meteorological Office, is a weather chart for the particular reception period during October 1975. It shows the high-pressure region centred over Central Europe with the associated occluded front (line AA).

## Watch the Weatherman

The daily weather forecasts shown on television are a recommended means of keeping track of impending tropospheric propagation conditions. Choose a forecast which shows the Atlantic chart with the various high and low pressure areas marked. Make a note of any approaching high-pressure areas. Currently, the best time to watch the weather forecasts on weekdays are at 6.30pm and 9.30pm on BBC-1.

## First Signs

Assuming that the weather condition is purely anticyclonic, a noticeable increase in the signal strength of usually weak transmissions will be experienced. Tuning through the u.h.f. band may reveal distant stations appearing on otherwise vacant channels.

Long distance signals will be at their best in Band III and on the u.h.f. bands

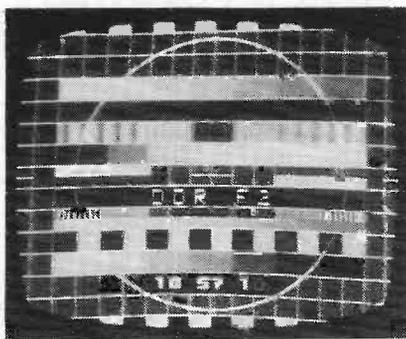


Fig. 2: The East German test card of the 2nd network received from the channel E34 transmitter located at Brocken

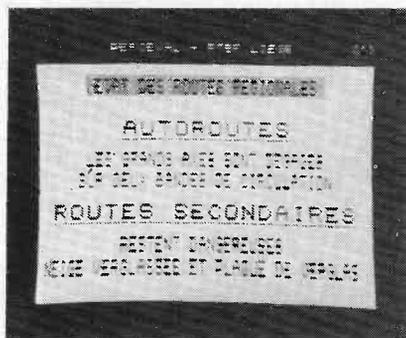


Fig. 3: Text page as broadcast by the Belgian French-language TV series service from Liège on Channel 42



Fig. 4: The Swedish clock caption as received on Channel E33 during an intense opening from the 100kW transmitter at Hoerby

(Bands IV and V) in the early morning and late evening, or to be more precise between the late evening and early morning.

If you happen to tune an unfamiliar programme during conditions, the first sign that it may have come from overseas is the absence of sound. This is due to the difference in the intercarrier sound spacings found on TV systems outside the UK. These differences were discussed in Parts 2 and 4 of this series. Note that a

picture without sound does not necessarily guarantee that the signal originates from the Continent. Some receiver designs may feature a more efficient intercarrier sound circuit than others. Consequently, one model may produce sound on a given level of signal input while another will not. By thumbing through the TV programme guides or briefly tuning into the local transmissions, a process of elimination should reveal whether or not it is a genuine Continental signal. Colour is often present provided that the signal is of sufficient strength to overcome the threshold of the colour killer circuitry within the receiver. It goes without saying that a receiver specifically designed for the UK will only resolve PAL broadcasts. SECAM transmissions will be displayed in monochrome on a PAL receiver. A French signal will exhibit unstable frame and line synchronisation with reversed video information, i.e. the whites appear black and blacks appear white. This is because positive vision modulation is employed with the French system as opposed to negative modulation as used elsewhere throughout the world.

## Stable Results

Tropospheric propagation has the advantage that received signals are not subject to the rapid fading and phase-distortion normally experienced with Sporadic-E. This means that reception can sometimes be of entertainment quality with results indistinguishable from those of the local BBC or IBA transmissions. Signals via tropospheric propagation, unlike Sporadic-E, do not arrive at an angle and reception techniques usually reserved for fringe areas should be considered. This implies the use of sensitive antennas as high as possible feeding a low noise mast-head amplifier. The disadvantage with this type of reception is that local irregularities in terrain tend to obstruct the signal path. This means that if your take-off in the general direction of the Continent is poor then your chances of good results will be impeded.

The possibility of successful tropospheric DX from the Continent is best assessed under normal, or what is sometimes called "flat" conditions. Studying UK transmitter listings and the relevant service area maps (often available from the BBC and IBA) should provide clues as to what you might resolve by carefully tuning through the u.h.f. channels. If possible, a wideband antenna covering channels 21 to 68 is best used for this assessment. It need not be too elaborate and a more sophisticated and sensitive array can be installed at a later date. It should be mounted at a minimum height of 10m and directed towards the anticipated transmission. A mast-head pre-amplifier is not usually necessary at this stage. If reason-

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# SELCALS

John Davies

Most of the modern airliners of today are equipped with two types of radio, a v.h.f. (very high frequency) and the other being an h.f. (high frequency) type.

Transmissions on v.h.f. are mainly confined to domestic routes where there is ample opportunity to sight antennas. The signal which is received is normally free from interference and the range being restricted to approximately 320km. The aircrew can monitor transmissions constantly with the use of headsets. Indeed it is mandatory in most countries to listen out above 10 000ft when such transmissions are being received although hand mics can be used with the speakers turned up.

## HF or VHF?

The h.f. is used when the aircraft cannot receive v.h.f. transmissions. Therefore you would expect aircraft to use this method of communication when crossing large land or sea masses where no v.h.f. facilities exist or where they would be impracticable to operate. Good examples are flights that cross the Atlantic or cross desert areas.

Conversely to the v.h.f. signal, the short wave or h.f. signal can be subjected to all manner of interference. Factors which may govern transmissions are the time of day; the weather and position of the aircraft, all of these can contribute to a good radio relay taking place. With these problems, a system had to be devised whereby the cockpit crew of an aircraft need not constantly monitor hours and

**SELCAL is an abbreviation of the radio system called selective calling. It is a form of communication which assists aircrews from keeping a constant listening watch on a specific frequency.**

hours of unwanted interference. The thought of a long flight listening to varying noise levels would be hard and extremely exacting for pilots.

This is where the SELCAL system plays a vital and major part in long distance communications. It is now possible for an aircraft which is monitoring a specific radio frequency to be called with no speech taking place whatsoever. A coded radio signal is transmitted from a ground control and is received by a decoding device in the aircraft.

This output code is then fed into a SELCAL decoder which can activate an aural and visual alert for the aircrew. This will only operate if, and only if, the received code corresponds to the code selected on the SELCAL decoder in the aircraft.

## Transmitted Codes

The transmitted codes from the ground stations are made up of two frequency pulses: (r.f. bursts), each being of  $1 \pm 0.25$

seconds separated by a period of  $0.2 \pm 1$  seconds. During each pulse the transmitted carrier is 90 per cent modulated with two tones, thus there are a total of four tones per call, the frequencies of the tones determine the code.

The tones are given in the formula:

$$fN = \text{antilog} (0.054 (N - 1) + 2.0)$$

where  $N = 12, 13, 14, \dots, 27$  this gives a total of sixteen tones between 312.6 and 1479.1Hz. The tones are designated by the letters A to S. Omitted are the letter I, N and O. So for example a typical SELCAL you may hear would be AB-CD (alfa bravo - charlie delta) or GH-AM (golf hotel-alfa mike).

A simple way of looking at the system is to give the letters numbers, e.g. A = 1, B = 2 and so on. Therefore the second and fourth letters must always be higher in value than the first and third. So AB-CD is correct but not BA-DC, also GH-AM is correct but not HG-MA. Another which also applies is that you cannot have the same letter twice in any SELCAL, so BD-DM is incorrect.

## 2970 Codes

There are 2970 codes available for assignment to aircraft using the first twelve tones, but recently an addition has been made which now incorporates the tones P, Q, R and S raising the total to 10920. Codes or blocks of codes are assigned on request to individual airline operators who in turn assign the SELCAL code to their aircraft either on a flight

Table 1

Boeing 757 Aircraft Reg.	SELCAL	Boeing 747-236 Aircraft Reg.	SELCAL	Boeing 747-136 Aircraft Reg.	SELCAL	Tristar -200 Aircraft Reg.	SELCAL
G BIKA	KLAF	G BDXA	BDCJ	GAWNA	BDAE	G BGBB	ADHM
G BIKB	KLAG	G BDVB	BDAJ	GWANB	BDAF	G BGBC	ADJK
G BIKC	KLAH	G BDXC	AMHK	GAWNC	BDAH	G BHBL	BJKL
G BIKD	KLAJ	G BDXD	AMGJ	GAWND	BDCG	G BHBM	BJKM
G BIKF	KLAM	G BDXE	BDAG	GAWNE	BDEF	G BHBN	BKAE
G BIKG	KLBC	G BDXF	BDFL	GAWNF	BEGH	G BHBO	BKAH
G BIKH	KLBD	G BDXG	BDCK	GAWNG	BEKL	G BHBP	CDEJ
G BIKI	KLBE	G BDXH	BDEH	GAWNH	BEKM	G BHBR	CDEL
G BIKJ	KLBF	G BDXI	EFDL	GAWNJ	BGDE		
G BIKK	KLBG	G BDXJ	AGFL	GAWNL	EFGJ	Concorde Aircraft Reg.	SELCAL
G BIKL	KLBH	G BDXK	BDGL	GAWNM	EFHL	G BOAA	BDCM
G BIKM	FMHL	G BDXL	CJDL	GAWNN	KMCG	G BOBB	BDEG
G BIKN	FMJK	G BDXO	KMDJ	GAWNO	KMCH	G BOAC	BDFH
G BIKO	FMJL	G BDXP	AMGK	GAWNP	KMCJ	G BOAD	BDAK
G BIKP	GHAB			G BBPU	BDCH	G BOAE	BDCF
G BIKR	GHAC	Tristar -1 Aircraft Reg.	SELCAL	G BDPV	BDCL	G BOAF	AGEJ
G BIKS	GHAD	G BBAE	CKDG			G BOAG	BHFJ
G BIKT	GHAE	G BBAF	CKEH	Tristar -500 Aircraft Reg.	SELCAL		
G BIKU	FMKL	G BBAG	CKFG	(GBFCA) ZD948	BDAM	Boeing 747 Combi Aircraft Reg.	SELCAL
G BIKV	EFGL	G BBAG	KMDF	(GBFCE) ZD952	AMJK	G BDXM	CDFH
G BIKW	BDEJ	G BBAG	KMDF	G BLUS	AMGH	G BDXN	CJDM
G BIKX	BDEK	G BBAG	CKFJ	G BLUT	BDFM	G BLVE	AGHL
G BIKY	BDEL	G BBAG	BDGH			G BLVF	EFHM
G BIKZ	BDAL	G BBAG	BFKL				
G BMRA	BDCE	G BBAG	BDFK				
G BRMB	CDFG	G BBAG	BDEM				

# SELCALS

number or on an aircraft registration related basis. Although in latter years, SELCALs can be found allocated to individual aircraft as opposed to specific flights.

An example of this type of SELCAL allocation can be found with the Boeing 767 aircraft of TWA (Trans World Airlines). N.601TW is allocated DJ-AF, N.602TW – DJ-AG, N.603TW – DJ-AK and N.604TW is DJ-AL. This shows the block allocation applying to individual aircraft.

Indeed over the years a great deal of frustration has been endured amongst aviation enthusiasts who identify specific flights and are then unable to tie up the registration of the aircraft. With the SELCAL remaining more stable in their allocation to various airlines and aircraft this is now possible. To show how this can be achieved a fleet list of the aircraft in use with British Airways has been shown together with their allocated SELCALs, Table 1.

## Traced

A SELCAL can be traced through its life with a particular airline. You will more often than not find they were previously allocated to aircraft which are no longer in service. For example the SELCAL of AM-GK was allocated to a VC10 aircraft with the registration of G.ARVE this aircraft has since been withdrawn from use. The SELCAL is now carried on a Boeing 747 with the registration of G.BDXP. Examples can be found with other fleets where this has been implemented and SELCALs have been transferred to new aircraft joining the company. So with a block allocation of SELCALs it will be up to the individual airline to issue a particular code.

The larger passenger carrying aircraft would normally carry two identical SELCAL systems. The SELCAL decoder will therefore recognise a received combination of tones on any of five channels which correspond to that combination selected on the code select and annunciator panel. When the correct code has been transmitted by the ground controller it is recognised by the SELCAL unit and a chime switch is activated. This signal can also be received by means of a light in the cockpit of the aircraft. The light or lamp switch is by way of an interrupter circuit so that the lamps will in fact flash. A constant supply to the chime switch causes the chimes to sound. Both will continue until reset. Each lamp holder incorporates a switch which, when depressed, will release the lamp switch and chime switch. The tone filters in the decoder will typically be mechanically resonant devices.

Variations in the SELCAL arrangement are possible. The control and annunciator panel can be separate units. Should an



You can see the number of the aircraft and its SELCAL from the plate on the control panel.

airline or an operator require aircraft related codes there will be no need for the code select switches with the appropriate code being selected by jumper leads to the rear connector of the SELCAL unit in the aircraft.

## Lamps and Chimes

The lamp and chime supplies can be changed at the operators option. Possibilities are to reverse the situation and have steady lights and multi-stroke chimes, or have steady lights and a single stroke chime, in which case the interrupter circuit is not used.

What does this mean in non-technical jargon and how is the SELCAL system set up in practise? The equipment which is in use today consists of:

- (i) A ground SElective CALLing unit, this is where the SELCAL codes are entered by an operative or controller.
- (ii) A ground to air transmitter.
- (iii) An airborne receiver.
- (iv) The airborne SElective CALLing decoder and a signal indicator.

The technique which is employed is that a ground controller who wishes to contact a particular flight or aircraft will enter the code which corresponds to the SELCAL of the aircraft. It will then be transmitted by a radio signal to the aircraft. The pilot would then either see a light or hear a "bing-bong" chime from the SELCAL decoding unit in the cockpit in the aircraft. This would indicate to him that a controller wishes to communicate with him.

Aeronautical Radio Inc., sometimes referred to as ARINC are the issuing authority for SELCALs. They are an American based company who act as agents for ICAO. An operative or airline

will contact them with specific requirements and be asked for the registration and the routes the aircraft intends operating. A SELCAL will then be allocated to the operator and it is up to him to allocate it as required.

Every effort is made by ARINC to ensure that aircraft with the same SELCAL are not likely to be on the same radio frequency and working similar routes at the same time. Duplicate SELCALs are issued but normally to aircraft working on different continents. So for example the SELCAL GH-AB is issued to a British Airways 757, G.BIKP, which confines its working life to the European domestic routes and also the same SELCAL is issued to an Eastern Airlines A3000 Airbus, N.227EA which flies mainly in the United States and South America. The chances therefore of both aircraft being on the same frequency are very remote.

## Aircraft Identity

After discovering how it is possible to identify and aircraft's registration from its SELCAL, tune your h.f. receiver into the frequencies used by Shanwick Oceanic Control. This is the control which transmits to aircraft crossing the Atlantic Ocean.

When the aircraft first makes contact with Shanwick Oceanic Control you will hear the aircraft ask for a SELCAL check, this is in order to check the decoder for the Atlantic crossing. Contact will be made by aircraft travelling from east to west when the flight is at 10 degrees west. As Shanwick Oceanic control is continually manned there are no problems with the

# RADIO DATA SYSTEM

Peter Shore

RDS is potentially the biggest technological breakthrough in radio terms since the widespread introduction of the transistor in the 1960s. Almost overnight, RDS could do away with the need to fiddle with tuning knobs and dials, enabling direct and simple access of stations. With more and more stations crowding onto the dial, it will do away with any uncertainty as to which station one is actually tuned to. This problem of overcrowding and difficulty of station identification is highlighted on the frequency chart which shows stations currently broadcasting and those planned which will be audible just to the west of London on v.h.f. f.m.

The concept of RDS is remarkably simple: the addition of an inaudible data signal to the transmission, which, once decoded can perform many jobs, including most fundamentally, telling the listener what station the radio is tuned to. Each specially equipped RDS receiver will feature a display to show in plain language the station name: e.g. "BBC R3".

Secondly, where a station is available on more than one frequency in an area, the RDS receiver will continuously compare the reception of each frequency and automatically tune to the one offering best reception.

## How it Works

It has long been known by engineers that data sub-carriers can be used

**This autumn, more than ten years of work by engineers across Europe comes to fruition with the introduction by the BBC here in the UK of "user-friendly" radio, and the Radio Data System (RDS).**

successfully with v.h.f. f.m. broadcasting, and indeed different uses have been found for sub-carriers in different countries during the past few years, notably the ARI (Autofahrer Rundfunk Information) system in West Germany. The technical standards for the application of RDS are the result of extensive work carried out under the auspice of the European Broadcasting Union, using the Public Information system developed by the Swedish Telecommunications Administration as a basis.

The data sub-carrier frequency in RDS is 57kHz, three times the frequency of the stereo pilot tone and during stereo transmissions will be locked to the third harmonic of the pilot tone. The tolerance of the sub-carrier frequency will be  $\pm 6$ kHz in both mono and stereo broadcasts.

The injection level for the data sub-carrier has been set at around 3 per cent — obviously, the higher the input level, the more accurate and error-free the signal will be but this would have an adverse affect

on interference to the audio channel when reception is under non-perfect conditions, or a receiver is not correctly aligned. The EBU specification allows for the injection of the sub-carrier to be between  $\pm 1$ kHz and  $\pm 7.5$ kHz with experience at the BBC showing that very little is to be gained by using more than the permitted minimum value.

RDS data is arranged in 26 bit block lengths, 10 of which are error control bits, making it possible to correct an error burst of up to 5 bits length in a block. Baseband coding is structured to form groups of 104 bits each, made up of four blocks of 26 bits. The data transmission is fully synchronous and there are no gaps between the groups or blocks. At the start of each group, the Programme Identification (p.i.) code is included, ensuring that this fundamental information is repeated at an adequate rate for effective automatic search tuning-in fact, eleven times each second.

Thirty-two group types are available, of which less than half have yet been defined, giving much scope for the future development of the system.

The applications which have been identified thus far are:

PI Programme Information A code broadcast which uniquely identifies each radio service. The code is used by the radio receiver confirm that it remains with the

949 BBC LONDON L/R  
952 BBC OXFORD L/R  
958 ILR LONDON  
966 ILR GUILDFORD  
970 ILR READING  
973 ILR LONDON  
1027 ILR REIGATE  
1040 BBC REIGATE L/R

## STATIONS NOW IN OPERATION



939 BBC OXFORD  
935 BBC WROTHAM  
929 BBC ROWRIDGE  
925 BBC GUILDFORD  
917 BBC OXFORD  
913 BBC WROTHAM  
907 BBC ROWRIDGE  
903 BBC GUILDFORD  
895 BBC OXFORD  
891 BBC WROTHAM  
885 BBC ROWRIDGE  
881 BBC GUILDFORD

1080 INR THAMES VALLEY  
1073 BBC THAMES VALLEY  
1067 BBC THAMES VALLEY  
1061 BBC THAMES VALLEY  
1055 BBC THAMES VALLEY  
1049 BBC THAMES VALLEY  
1049 BBC HIGH WYCOMBE L/R  
1046 BBC GUILDFORD L/R  
1044 BBC READING L/R  
1041 BBC THAMES VALLEY L/R  
1034 ILR KENLEY  
1029 ILR BASINGSTOKE  
1025 ILR OXFORD  
1021 INR LONDON  
1017 INR HIGH WYCOMBE  
1015 INR MICKLEHAM  
1015 INR CATERHAM  
1013 INR OXFORD  
1009 INR WROTHAM  
1004 INR ROWRIDGE  
1002 INR KENLEY  
1001 INR WOORBURN  
999 INR GUILDFORD

## STATIONS PLANNED

883 BBC WOORBURN  
884 BBC KENLEY  
897 BBC CATERHAM  
897 BBC MICKLEHAM  
899 BBC HIGH WYCOMBE  
905 BBC WOORBURN  
906 BBC KENLEY  
919 BBC CATERHAM  
919 BBC MICKLEHAM  
921 BBC HIGH WYCOMBE  
927 BBC WOORBURN  
928 BBC KENLEY  
941 BBC CATERHAM  
941 BBC MICKLEHAM  
943 BBC HIGH WYCOMBE  
946 BBC KENLEY L/R  
954 BBC WINDSOR L/R  
962 ILR AYLESBURY  
977 BBC GUILDFORD  
979 BBC WOORBURN  
980 BBC KENLEY  
982 BBC ROWRIDGE  
988 BBC WROTHAM  
991 BBC OXFORD  
993 BBC CATERHAM  
993 BBC MICKLEHAM  
995 HIGH WYCOMBE

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Please note that the **AMTOR** section only receives ARQ mode (mode A) but this is the most common mode and covers a lot of commercial TOR stations, also.

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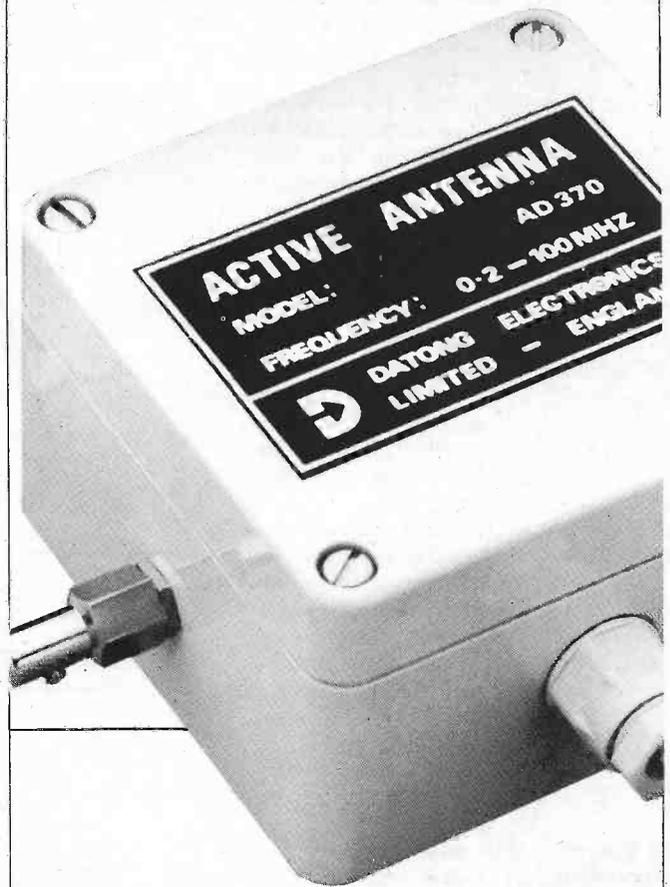


technical software (SWM)



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# Active Antennas



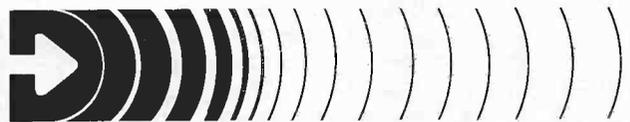
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# RADIO DATA SYSTEM

listener's choice of station, even when travelling around the country.

PS Programme Service\*

This code produces a plain language display on the receiver of the station to which it is tuned.

CT Clock Time\*

Provides the receiver with an accurate display of time and date. This will automatically adjust to local time when travelling across Europe in addition to correcting to time changes in the UK during the spring and autumn.

AF Alternative Frequency\*

This provides the receiver with a list of frequencies in the area on which the same programme may be found.

ON Other Networks\*

This information tells the receiver where to find the best frequency for other networks and local radio available in the area. This enables the receiver to instantly change to the best frequency available for another station when the user changes channels.

TP Travel Programme

A detailed explanation of the application of these codes is given later.

TA Travel Announcement\*

PIN Programme Identification

This provides a unique code to each radio programme and may be used to enable a radio to automatically switch on a listeners' choice of programmes.

TDC Transparent Data Channel

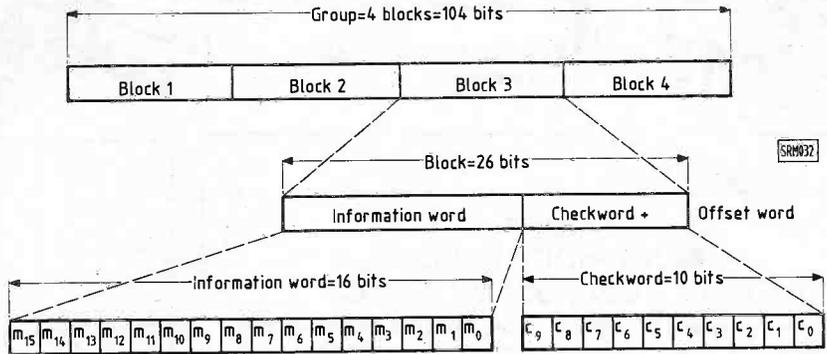
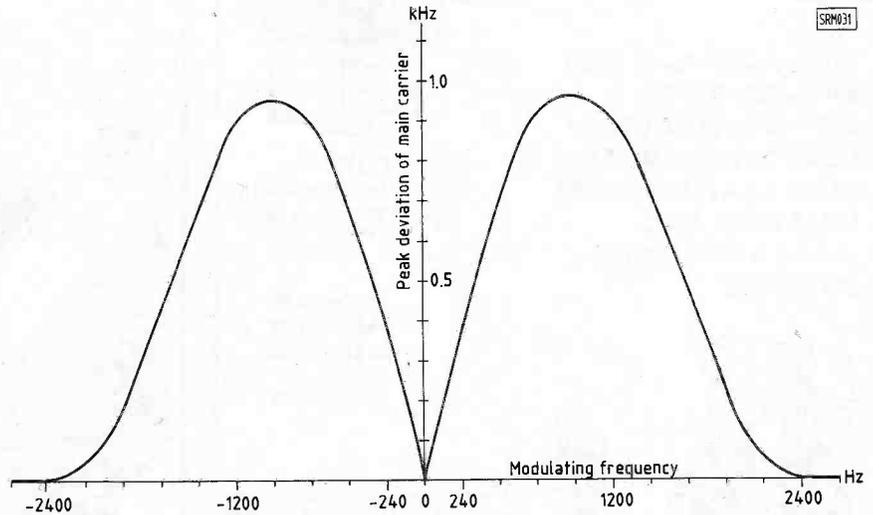
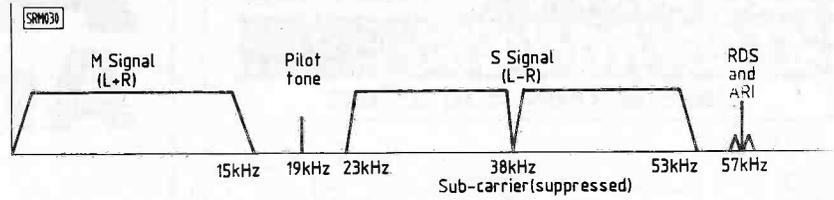
Two applications designed to display textual messages on suitably equipped receivers and can also be used to download information into computers, or to activate voice synthesis devices, perhaps for spoken travel messages for car drivers in their own languages.

DI Decoder Information

A signal to switch decoder modes (e.g. mono to stereo) in the listener's receiver.

MS Music-Speech

Designed to indicate to the receiver which of two user-set volume settings to use dependent on programme content. It enables the listener to set his own preference



PTY Programme Type

for relative levels of music and speech.

A code sent with each programme, allowing suitable equipped receivers to select the type of programme the listener prefers automatically — for example, a listener could ask for drama, and the radio could then tune to any station broadcasting drama.

IH In-House

Used by broadcasters and not intended for public reception.

Those applications which the BBC is introducing initially are highlighted with an asterisk.

Perhaps the most important features for motorists are the TA and TP codes. These are to be introduced by the BBC during 1988, and together they will enable listeners to receive their choice of radio station, cassette or nothing at all, with the option of receiving any local travel bulletins applicable to the area in which they are travelling as they are broadcast.

## What Happens

News of an incident affecting motorists on for example the M11 at junction 10 will be passed to the studios of Radio Cambridgeshire by the police in the normal way. When the presenter on the station is ready to read the bulletin he will play the usual travel information "jingle" and read the message. The start of the "jingle" will be electronically detected and information passed by means of data links to the transmitters in the area (in this instance Talcolnston and Peterborough). These transmitters radiate the national services, (Radios 2, 3 and 4 with Radio 1 in the future) and also the local Radio Cambridgeshire programmes.

The information received causes the local radio transmitter to radiate additional RDS data signals (TA and TP) which tells the radio receiver that the local station is about to broadcast travel information for the area. Similarly, the national network transmitters simultaneously commence broadcasting RDS data through the ON (other networks) feature. This tells the receivers tuned to a national service the frequency on which a travel message is

# RADIO DATA SYSTEM

about to be broadcast. If the driver has selected a travel option on his RDS receiver, the radio will automatically retune to the frequency on which the message is to be broadcast — in this case Radio Cambridgeshire. At the end of the bulletin, the TA and TP signals are removed from the RDS data stream, and the radio automatically retunes to the original programme, or reverts to cassette listening.

The alternative frequency (AF) facility of RDS provides for the transmission of a list of other frequencies on which the currently tuned programme may also be received. The receiver builds in its memory a list of these frequencies and their corresponding signal strengths, with the receiver switching to whichever channel in its memory provides the best signal.

Two methods are available — the "list-method" and the "paired-frequency" method.

The list-method sends the alternative frequencies as a sequential list, two frequencies being transmitted in each block at a time. The list commences with a reference to the total number of frequencies in the list so that the receiver may check that it has received the complete listing without the data suffering corruption. The number of alternative frequencies in this method is restricted to twenty-five.

In the paired-frequency method, the sixteen bits reserved for alternative frequency (AF) use in block three of group OA are used to transmit a pair of frequencies. The first frequency of a pair is any frequency ( $f_0$ ), the second of the pair being one of the valid alternatives ( $f_1$ ) for the frequency  $f_0$ . In the next repetition of the block, the first frequency of the pair is again  $f_0$ , with the second being another valid frequency for  $f_0$  —  $f_2$ . This is repeated until all alternatives for frequency  $f_0$  have been transmitted. The next block will then comprise frequency  $f_1$  and the first of its alternatives and so on.

Pairs of frequencies are transmitted in this way until all the frequencies and their valid alternatives have been transmitted when the entire sequence is repeated.

The receiver manufacturers complained that too much memory space would be taken up with the deployment of the list-method. In some parts of Europe, because of the terrain and the nature of the network distribution system in use, twenty-five frequencies were an insufficient number to reference all alternatives required. The advantage of the paired-method frequency is that it is possible to structure the pairs of frequencies in such a way that the second frequency is always a valid alternative for the first frequency of the pair in a way that is not possible in the list-method.

Receivers have to be capable of recognising both of the methods, and to respond accordingly. The BBC will be using whichever is the more advantageous in any given situation.

## RDS Services

The National Broadcasters throughout most of Europe are introducing their RDS services from 1987 onwards, and because the standard is universal throughout Europe, radio will function equally well in all countries, although not all administrations are intending to introduce precisely the same features of RDS.

In the UK, the Independent Broadcasting Authority has announced its intention to encourage radio franchise holders to broadcast RDS.

Radio manufacturers both in Europe and the Far East are actively developing RDS-capable radio receivers, primarily for the car radio market, for which RDS is particularly of use, but it is understood that fixed radio receivers are also under development. It is known that Volvo are about to introduce a car radio with RDS capabilities.

The Radio Data System is certainly a great leap forward for the industry: whether or not it will be accepted by listeners is, of course, another matter entirely. □

# INTRODUCTION TO DX-TV

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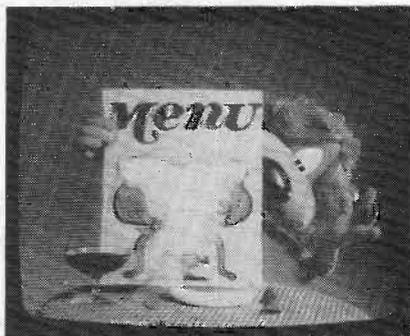


Fig. 5: Dutch television at u.h.f. featuring the antic of Loeki the lion between adverts! Note the slight line pairing effect from the co-channel transmission

able results can be obtained from high-power UK transmitters at a distance of more than, say, 80km away from your location, in the general direction of Europe, then it is fair to assume that under enhanced conditions Continental DX will present few problems.

## UK Location

Your geographical location in the UK will also have some influence on how successful



Fig. 6: Band III reception from the Halden outlet on channel E11 showing the Norwegian station opening caption

tropospheric DXing at Band III and u.h.f. will be. During a typical opening, signals from transmitters anything up to 640km distant can be expected. If you are lucky enough to live in the south-east of England or East Anglia, transmissions from the Netherlands, Belgium and France should be available, of sorts, on a daily basis. During enhanced conditions, the reception of stations located in Central Europe should be reasonably assured. However, if you are unfortunate enough to live

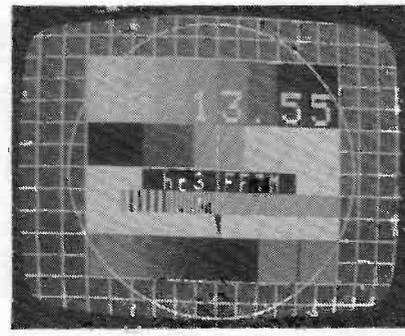


Fig. 7: A West German test pattern from Hessischer Rundfunk at u.h.f.

(by DX-TV standards) in Northern Ireland or the Outer Hebrides, much of your reception will be from BBC and IBA transmitters sited in the UK and the best tropospheric DX you might hope to secure will probably only originate from Crystal Palace!

## Correction

The address for Protel (suppliers of antennas) given in Part 1 should have been 295 Ballards Lane, London N12 8NP.

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## Communication decoders

### AFR-1000 Automatic CW-RTTY Decoder



The microprocessor-controlled POCOM AFR-1000 CW-RTTY Decoder automatically processes radio teletype signals in accordance with Baudot No. 1 and No. 2, ASCII, ARQ/FEC (SITOR/SPECTOR/AMTOR) and CW (Morse telegraphy) standards and corresponds to the latest state of the art. The AFR-1000 Automatic Decoder is remarkable for its value for money. Its moderate price makes it particularly suitable for the cost-conscious RTTY beginner. Unlike the other models in the AFR series, however, it cannot be upgraded for special codes.

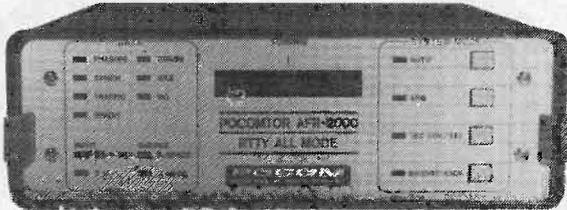
#### FEATURES

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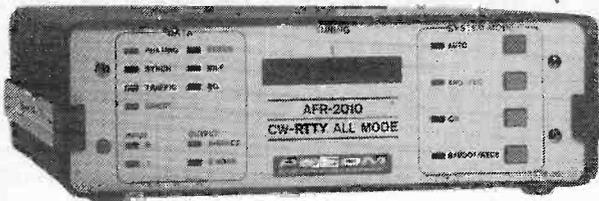
The POCOM AFR-1000 is extremely easy to use and very simple to operate. The AFR-1000 is simply connected to the loudspeaker outlet on the shortwave receiver. Operation is confined merely to choosing the mode required. No tiresome testing of the baud rate and shift position. Two LED's indicate the active operation states in each case.

The baud modulation rate measurement facility is a complete new innovation in a unit in this price range. Knowledge of the baud rate permits reference to special codes, specific radio services, etc., and makes it possible to shed light upon a radio teletype signal. The display is provided on the screen or printer linked to it to 1/1000 baud (e.g. 96.245 bauds) with quartz accuracy and within a measuring range of approx. 30 to 250 bauds.

### AFR-2000 All Mode RTTY Decoder



### AFR-2010 All Mode CW/RTTY Decoder



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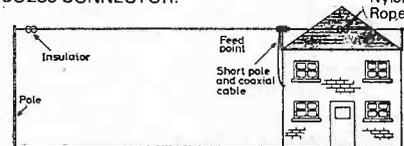
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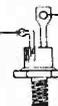
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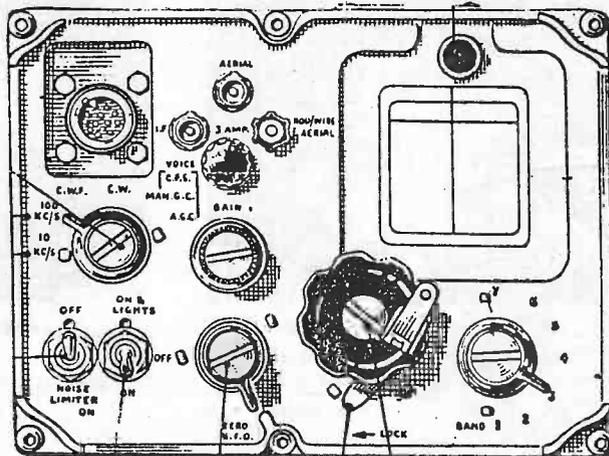
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# IDEAS FOR CHRISTMAS

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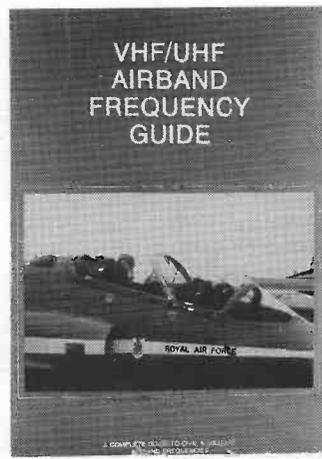
## UK Listeners Confidential Frequency Lists



Published Waters & Stanton  
 Author Bill Laver  
 Page size 210 x 296mm  
 Pages 124  
 Covers Soft covered  
 Chapters 12  
 Price £5.95 plus 75p P&P  
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Preface  
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 Receivers  
 Aerials, RTTY  
 Facsimile; Stations in this Guide  
 Marine Services  
 Aeronautical Communications  
 Unusual Transmissions  
 Frequency Allocations  
 Broadcast Station Schedules  
 Frequency Listings 1.6– 30MHz  
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 "A comprehensive list of h.f. frequencies 2– 30MHz. Including: Aviation, Marine, Broadcast, Embassy, Military, RTTY, Press, etc."

## VHF/UHF Airband Frequency Guide



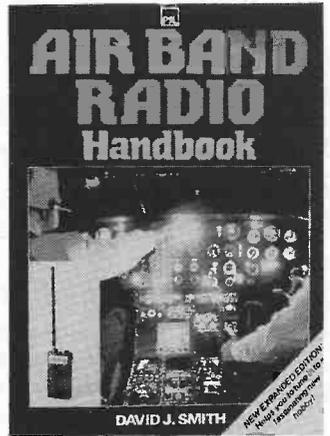
Published Waters & Stanton  
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How it all Began  
 Receiving Airband Signals  
 Receiver and Aerial Requirements  
 Airband Frequencies and Services  
 Aerodrome Frequency List  
 VOLMET Service  
 Airways Frequencies  
 Flight Information Regions  
 Other Frequencies of Interest  
 Company Frequencies  
 Telephone Designators  
 UHF Emergency Fixer Service  
 Offshore Oil and Gas Helipads  
 Military Lower Airspace Radar Service  
 ICAO Location Indicator Codes  
 Abbreviations

"A complete guide to civil and military airband frequencies".

## Air Band Radio Handbook

Published Patrick Stephens Ltd  
 Author David J. Smith  
 Page size 157 x 215mm  
 Pages 174  
 Covers soft covered  
 ISBN 1 85260 047 0  
 Chapters 19 (see below)  
 Appendices (see below)  
 Price £5.99 plus 51p P&P



This book aims to help the listener unravel the jargon and events surrounding Air Traffic Control. Whether you go out to airfields with your radio, or live near an airport, there are times when the enthusiasts wants to know, "what are they on about". The messages that pass between pilots and the ATC are short, sharp and make very little sense to begin with — this is never helped if it is a foreign accent either. Once you start understanding what's happening, a whole new world of radio listening opens up for you. The author is very obviously an enthusiast and the press release that came with the book explains further. He joined the Ministry of Aviation in 1965 and has worked at locations throughout the

country in Air Traffic Control. Since 1982, he has been working at Liverpool Airport. The chapter that interested me the most was the one on air displays. That's because we live within view of three places that regularly hold air displays and I've often wondered what gets said during the displays. When you watch an air display, it always looks so slick and professional. After reading this book you realise that there is a great deal of frantic

rushing about going on behind the scenes. Displays have to be extended as the next performer isn't ready, reshuffling takes place and things sometimes get muddled. Lots of the sorting out takes place on the radio, with the display co-ordinator in touch with the pilots. Apparently "heated exchanges" may take place — I shall listen carefully next time! If you're not sure where to look for the different airports and airfields then the appendices will come to your rescue. There is an alphabetical list of the airports and airfields with their appropriate tower, approach, radar, etc., frequencies. There is also a list in numerical order. Both the v.h.f. band and u.h.f. bands are covered separately. The Book is available from Patrick Stephens Ltd., Dept 985A, Denington Estate, Wellingborough, Northants NN8 2RQ. Abbreviations and Q-Codes  
 Chapter 1: Listening  
 Chapter 2: ATC terminology  
 Chapter 3: Types of airspace  
 Chapter 4: Navigational aids

Chapter 5: Area or Airways Control  
 Chapter 6: Approach control  
 Chapter 7: Aerodrome control  
 Chapter 8: ATC at Heathrow  
 Chapter 9: Oceanic Control  
 Chapter 10: Flight Information Services  
 Chapter 11: Weather and Air Traffic Control  
 Chapter 12: Airfield visual aids  
 Chapter 13: Airport operations and procedures  
 Chapter 14: Royal flights  
 Chapter 15: Air displays  
 Chapter 16: Emergencies  
 Chapter 17: Air band radios  
 Chapter 18: Charts and related documents  
 Chapter 19: Magazines for the enthusiast and air band listener  
 Appendix 1: Beacons and reporting points  
 Appendix 2: Airways frequency allocation  
 Appendix 3: VHF air band frequencies  
 Appendix 4: UHF air band frequencies  
 Appendix 5: ICAO Aircraft type designators  
 Appendix 6: Aircraft radio call signs

# IDEAS FOR CHRISTMAS

## Steepletone MBR7

<b>Coverage:</b>	
l.w.	150 – 300kHz
m.w.	540 – 1600kHz
s.w.1	7.00 – 22.00MHz
s.w.2	2.3 – 7MHz
f.m.	88 – 108MHz
Air	108 – 135MHz
MBf.m.	140 – 175MHz
<b>Power</b>	4 x 1.5V D cells, 12V d.c. or 240V a.c. mains
<b>Audio</b>	100mm internal speaker or headphones
<b>Antenna</b>	900mm telescopic antenna, external antenna socket and ferrite rod
<b>Tuning</b>	Rotary tuning (including fine tune)
<b>Weight</b>	2.71kg
<b>Dimensions</b>	268 x 355 x 144mm
<b>Price</b>	£65

The MBR7 is a very attractive looking multi-band radio with many interesting features. The physical appearance is dominated by a T shaped moulding on the top of the cabinet which is actually a "direction finder". The supplied manual was brief but adequate and offset by a rather good short wave station guide. This guide lists, in alphabetical order, a good selection of international broadcast stations including callsign, power, frequency and transmission times. I thought this was a very useful addition.

The power supply arrangements for this set are very versatile which is a big plus point. The first and probably most used option is to use the built-in mains power unit. The mains connection is made via a 1.8m two wire cable which is correctly colour coded blue and brown. One thing that really pleased me was that there is enough space in the cabinet to stow the lead and a 13A mains plug! The manual also gives

correct details for the termination of a standard 13A plug. To use the MBR7 for portable use, four D cells will need to be fitted in the battery compartment. The changeover from a.c. to d.c. power sources is by a small but well marked slider switch on the rear panel. The final option for the power source is to use an external 12 volt power supply. There is a car adaptor available which fits into a standard cigar lighter socket. If required the radio can be operated from any well smoothed and fused 12 volt power supply via the standard power jack on the rear panel.

The audio section of the radio is controlled by separate rotary volume and tone controls which are mounted on the front panel. One unusual feature is the inclusion of a switch to enable the audio amplifier to be used as a sort of mini public address system. When used in this mode a microphone/record player, etc, can be connected via a 3.5mm jack socket on the front panel.

The medium and long wave broadcast band performance was very good, with the automatic gain control coping well with the majority of signals. The very effective tone control made it very easy to obtain a pleasant sound on all the a.m. broadcast bands. The antenna on the long, medium and short wave bands comprises a ferrite rod mounted in the T moulding on the top of the radio. This novel arrangement works as a direction finder as the T moulding is rotatable through about 130°. The main advantage of this system is not for direction finding but for reducing interference from adjacent stations. This is achieved by rotating the antenna assembly for the best compromise between the wanted and unwanted signals. In order to help find the correct tuning point a tuning meter is incorporated to the left of the main dial. The meter is slightly unusual in that it works in the opposite



sense to normal, i.e. full scale deflection indicates no signal whilst minimum deflection is maximum signal strength. This reverse indication, although unusual, didn't present any problems and was in fact a very positive tuning aid.

The short wave coverage is very comprehensive being continuous between 2.3MHz and 22MHz. The performance when receiving short wave broadcast stations was very good. A nice point is the inclusion of a fine tune control to aid tuning in these congested bands. An unusual feature is that the ferrite rod antenna is used for short wave reception. This doesn't seem to present any problems, in fact there are advantages in that the directivity of the ferrite rod can be used as described earlier to minimise any interference. The only snag I found with the short wave reception was that with a.m. as the only mode available, the marine and amateur band coverage was rather wasted as single sideband is the primary mode on these bands.

The performance on v.h.f. broadcast stations was very good

indeed and the audio quality from the 100mm internal speaker was excellent. A switchable automatic frequency control is also provided which can be useful when trying to receive a weak signal which is close to a much stronger station.

The v.h.f. coverage is extended by a separate band covering 108-175MHz. It is very unusual to get a range as wide as this in a receiver of this type. This extended range encompasses the marine band as well as the more usual air band. As with a lot of receivers of this type the air and marine band coverage uses the same f.m. demodulator as the v.h.f. broadcast band. This creates a few problems in as much as signals must be carefully tuned for best results and the bandwidth is rather wide for best performance. In practice these problems are not too limiting especially for those who only occasionally monitor the air/marine bands.

The receiver was loaned by **Johnsons Shortwave Radio, 43 Friar Street, Worcester WR1 1NA. Tel: 0905 25740.**



## Binders & Subscriptions

One of the "best" gifts you can buy this Christmas is a Short Wave Magazine subscription. The rates are:

UK – £17.00  
Overseas – £19.00

A joint subscription to both Short Wave Magazine and Practical Wireless is:

UK – £27.00  
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Don't forget to tell us which issue you would like the subscription to start from.

You can also obtain binders to hold 12 issues of your favourite magazine. These are £3.95 including postage and packing.

We take both Access and Visa and the telephones lines are open 24hrs to make ordering easy.

# IDEAS FOR CHRISTMAS

## C. M. Howes DcRx Kit

DcRx	Direct Conversion Receiver
Bands	Available for 14MHz, 7MHz, 3.5MHz and 1.8MHz
Options	Kit or ready built p.c.b.
Modes	s.s.b. and c.w.
Power	12-14V d.c. supply needed

The DcRx kit is a low-cost, easy to build, amateur band receiver. It has been designed so that a newcomer to the hobby can build a short wave receiver with the minimum of trouble.

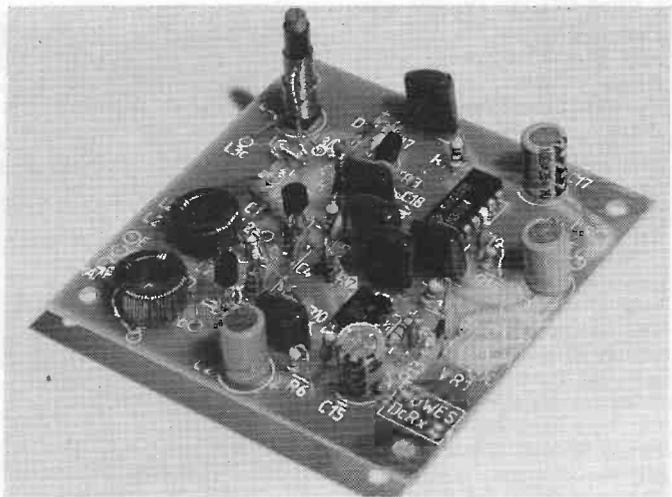
The kit comes complete with all the components with the exception of the large tuning capacitors, and even these may be available from C. M. Howes if stocks last. The printed circuit board has clear placement markings on the top side of the board to enable even the novice constructor to get it right first time. The instructions, though

concise, are very clear with an exact building procedure linked to columns for ticking off component placement and checking.

The components are good quality standard items and the p.c.b. is thick glass fibre board. Fortunately for the beginner, the coils are pre-wound and ready to place on the board. Although the kit comes with the components you need, items such as the box, slow-motion drive and knobs aren't there. Now that's not a bad thing because if you go to rallies or radio club meetings with junk sales, you can pick these items up very cheaply.

The design used is a conventional one, but at least its reliable. The tuned input is mixed with the signals from an f.e.t. v.f.o. by a twin j.f.e.t. mixer. The audio is pre-amplified and filtered in a single low-noise operational amplifier stage and the final audio amplification is done in a single integrated circuit amplifier.

One point worth mentioning is that the frequency stability of this kit is so good that the receiver can be used for receiving RTTY and AMTOR signals. That's pretty



good for a home built kit, some ready-made radios can't cope with those types of signals!

If you get the 14MHz version, it can be re-tuned for the "new" 10.1MHz band. If you are a "seasoned" constructor, many of the units could be retuned and used on all kinds of bands.

The tuning range covers the whole band for s.s.b. and c.w. reception, and the receiver is

capable of 1 watt of audio output and requires a 12 to 14 volt d.c. supply (the quiescent current is about 30mA).

If you would like details of the kits that C. M. Howes produce, then an s.a.e. will bring a two-page catalogue. Write to **C. M. Howes Communications, Eydon, Daventry, Northants NN11 6PT. Tel: 0327 60178.**

## Science Fair 200-in-1 Electronic Kit

Cat. No. 28-265  
Price £34.95

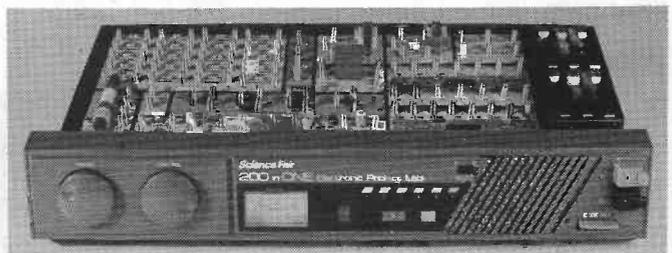
This project box is suitable for people 10 years of age and over, mainly because the 108-page instruction book takes a bit of reading. Not that it is complicated, just large (365 x 241mm), which is not surprising with the details of 200 projects included.

There are some neat cartoons decorating some of the pages, making it interesting reading. Just in case this is your first venture into electronic projects, there are diagrams of all the components so you know what resistors, transistors, integrated circuits, etc., look like when they are mentioned.

Rather than describe all 200

projects (we'll be here until next Christmas!), I'll pick just one. Project 95 is a basic audio oscillator.

I chose this one as the circuitry is used many times over in lots of the other projects both in this kit and in other designs. The instruction book asks you "how the circuit works", the answer is written inverted underneath if you get stuck. There is a circuit diagram and a numerical wiring sequence to follow. All the close wound springs that form the connections are labelled 1 to 176, so it's very easy to wire each project. There is a section for the constructor to make notes against each project. This is useful as it provides a record of what you've done so far and makes sure you



understand things better.

Unlike some other project kits in the Tandy range this one has all the springs connected to the board when you buy it, so saving you the time it would take to put 176 springs in place.

I think this project set would be ideal, not only for youngsters, but for those who, in their childhood

had an interest in radio, but over the years have lost touch with some of the modern technology and would like to brush up their knowledge.

The kit was kindly loaned by our local Poole branch of Tandy and should be available in most other Tandy stores. It is also a recently added item to their catalogue.

## Science Fair Crystal Radio Kit

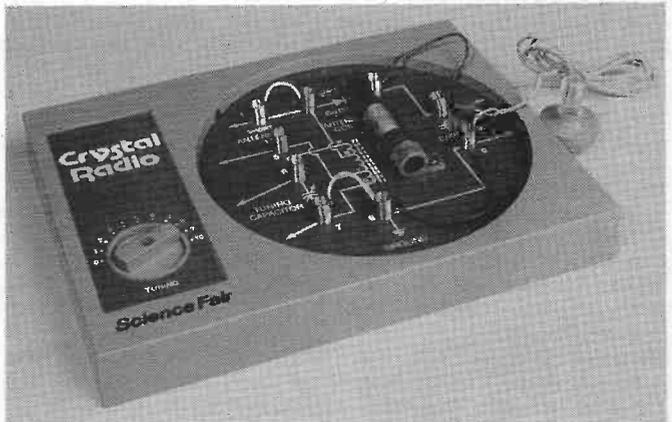
Cat. No. 28-219  
Price £3.95

This simple kit from Tandy gives a younger member of the family the chance to build and experiment with a simple electronic project. The crystal radio has been with us for many years and can provide surprisingly good results. This particular kit is supplied with a seven page instruction book giving good detail on how to build the radio. The method of construction used is very simple requiring only a pair of long nosed pliers and wire cutters. Each instruction is clearly written with a small box at the front for the constructor to "tick" as each step is completed successfully.

The basis of the kit is a plastics moulding with a cardboard insert

on which is printed the circuit diagram. The connections are made by trapping wires in close wound springs which are mounted in the cardboard insert. This technique, although cumbersome to describe was actually very effective in practice. It does at least ensure that no soldering is required and so much younger members of the family can be left to play with this kit. Everything needed to make this radio work is included as it doesn't need batteries — it must be one of the few toys that doesn't these days!

Once the step by step instructions have been completed, the manual continues with a section describing the antenna and earth requirements. As with any crystal set the final performance is dependent on the efficiency of the



antenna system and extra effort here will pay dividends. The final section of the manual contains a simple description of how the radio works along with a circuit

diagram.

This is only one in a range of similar kits available from most Tandy shops, this kit was kindly loaned by the Boscombe branch.

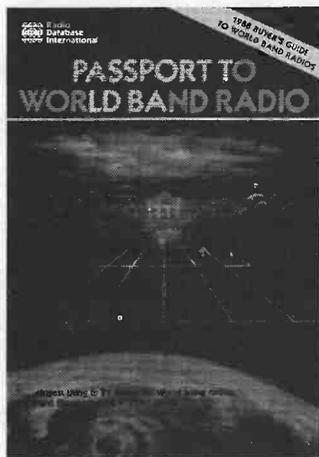
# IDEAS FOR CHRISTMAS

## Passport to World Band Radio

Published RDI  
Page size: 177 x 254mm  
Pages 255  
Covers Soft covered  
Price £14.50 plus £1 P&P

This publication was released in the United States in September, and supplies have now reached the European distributor.

255 pages of the book are coloured blue, and this is really the heart of the publication. It uses a well developed graphics format to visually illustrate the short wave radio dial. The frequency is shown down the side of the page, whilst the time is listed across each page. Pick a channel like 9.715MHz, and you can see at a glance which station is scheduled to use that frequency and at what time. If the language of the transmission is English, German, French, Portuguese, Spanish, Arabic, Russian, Chinese or Japanese you can actually see what time the broadcast in that language starts and finishes. Coverage starts at 2.300MHz and moves continuously up to 21.605MHz in the blue page section. However, two pages of the charts have been put in the white paper lexicon section covering 21.610 to



25.730MHz. Why this has been done isn't immediately clear but you might miss this at first glance.

The schedule section has obviously been compiled with care, and once you get used to the numerous abbreviations the book becomes quite a useful tuning aid as you spin the dial. Another 44 pages in the book cover receivers. There are one-paragraph summaries of most of the receivers currently on sale in North America from 50 to 8000 dollars. Author Larry Magne gives his

short and often critical opinion in a few lines. More detailed reports are included on the Sangean ATS-803, Sony ICF7600DA and 7600DS, Panasonic RFB-60, Philips 2935, Grundig Satellit 400 and 650, Sony ICF2001D, Kenwood R-5000, JRC NRD 525, Lowe HF125, Icom ICR-71, FRG-8800, and Ten Tec RX-325. Some of these reviews have previously appeared elsewhere (e.g. *Monitoring Times*), but have been thoroughly updated. They don't include technical measurements on the receivers. This is offered as a separate optional extra, costing 6 US dollars for EACH report that you're interested in.

The rest of the book contains advertisements from North American equipment dealers and 10 feature articles. One of the best we found was one by Don Jensen on listening to Latin American music with a useful one page guide as to what channels to pick in North America.

This book is a useful addition to the short wave listening hobby. But it has serious gaps in it if you try to use it on its own without other reference sources to hand.

Although stations are also listed in country order, there is NO time order listening. If you want to know what is on in English now, you're not going to wade through 257 pages to compile your own list. There's certainly enough space left in the book to incorporate such a listing without increasing the page count. There needs to be a warning somewhere that just because a 1 kilowatt station in Indonesia is on the air now, you can't expect fantastic reception in the heart of Europe. Likewise should you tune to 5.109MHz and hear distant voices, don't immediately assume you've heard the clandestine station Voice of the Burmese people.

You need to choose another book to find addresses of even the major stations, and to discover whether the international broadcaster of your choice also uses medium wave to reach you. In Europe, Asia and the Middle East medium wave is often the best method of international broadcasting across short distances, especially in winter.

Available from **Interbooks, SW4, Stanley, Perth PH1 4QQ.**

## Better Radio/TV Reception

Published Ashley Publishing  
Page size: 208 x 280mm  
Pages 125  
Covers Soft covered  
ISBN 0 9588532 07  
Chapters 7 (see below)  
Appendices 4 (see below)  
Price £9.95 plus 75p P&P

### Chapter 1: Radio/TV Reception — An Overview

Transmitters, Receivers, Broadcasting, Propagation, Factors Affecting Propagation, Time, Interval Signals, Programme Schedules, Radio Listening as a Hobby, A Hobby for the Handicapped, The Future of Radio Listening as a Hobby, Mini Glossary of Radio Terms, Abbreviations and Jargon.

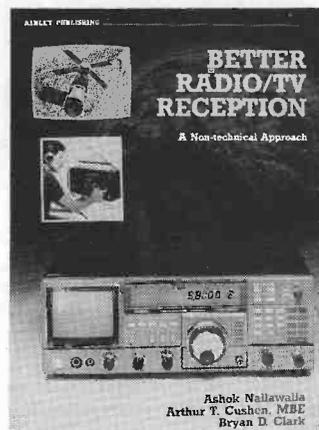
**Chapter 2: The Broadcasting Bands** Long Wave, Medium Wave, The Short Wave Bands, Short Wave Propagation, Very High Frequency and Ultra High Frequency, Terminology, VHF/UHF Propagation, Ionospheric Activity, Meteor Activity, Long Distance VHF Reception, Satellite Television Reception, Literature.

### Chapter 3: Receivers

Choosing a Receiver, Types, Prices, Features and Controls, Reception Problems, Buying/Operating Overseas.

### Chapter 4: Antennas

Antennas, Antenna Terminology, Types of Antennas, Omni-directional Antennas, Directional Antennas, Long Wave Antennas, Medium Wave Antennas, Short Wave Antennas, Active Antennas, FM and TV Antennas, Connecting the Antenna to the



Receiver, Types of Feeders, Losses, Velocity Factor, Connectors, Switches, Antenna Tuners, Installation Considerations.

### Chapter 5: Advanced Topics

Useful Accessories for the Radio Shack, Tips from the Experts, Computers and Radio.

### Chapter 6: The Broadcasters

Major Broadcasters, Minor Broadcasters.

### Chapter 7: The Hobby of Radio DXing

Introduction, The Reception Report, Verification, DXing Aids, DX Clubs, DXing Locations, Tips from the Experts.

### Appendix 1

Log Sheets

### Appendix 2

Metrics for Radio/TV

### Appendix 3

Time Difference Chart

### Appendix 4

#### Useful Addresses

Although this book is an Australian publication, don't let that put you off, the authors have made every effort to avoid any bias in their writing.

Most people don't need a book to tell them how to get pictures on their television or programmes on their radio. But what if you want to receive more exotic pictures or programmes and what happens during an ionospheric disturbance then you could find this book useful.

Right from the start this is a really easy book to read, they don't assume you know all the ins and outs of radio reception. The first chapter is called "An Overview", and explains all kinds of things regarding the world of radio. Each subject is described briefly, subjects such as call signs, troposphere, solar indices and literature. Any subject that is described in detail later in the book is only mentioned, just to let you know the subject hasn't been forgotten.

Also included in the Overview is a mini glossary of radio terms. In the list there were quite a few gaps — but then it is only a mini-glossary, there are also some words I wouldn't have expected to find, such as Luxembourg Effect and Exalted Carrier Selectable Sideband. Most of the entries though were well described if only briefly and at least give the reader an idea of the meaning of the words.

Two of the most interesting chapters, for me, were the ones on Receivers and Antennas. The section on Receivers starts off discussing The Best Radio? It describes very well how there is no best radio — it depends on the listeners needs and available cash! They do give some very good advice on how to go about getting the information you require about various radios. Also described are the various features and controls found on receivers. This gives the reader a chance to decide whether or not they would prefer a receiver with the various functions. Any one out to buy their first radio will find this useful when trying to weigh up the merits of different types of receivers.

The chapter on Antennas is as wide-ranging in its coverage as the previous chapter on receivers. First of all antenna terminology is described, then the different types of antennas. There are seven types of omni-directional antennas described, ten directional antennas (with constructional details for both a loop antenna and a m.w. amplifier given), seven s.w. antennas and a few f.m. and TV antennas. So you can see it's a very comprehensive list.

Connecting the antenna to the receiver is another subject dealt with in details, as well as installation considerations.

Available from **The Short Wave Magazine Book service, see page 54.**

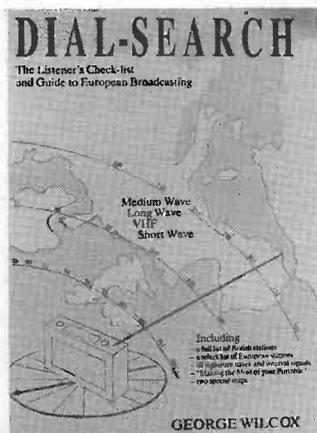
# IDEAS FOR CHRISTMAS

## Dial Search

Published George Wilcox  
 Page size 148 x 210mm  
 Pages 48  
 Covers Soft covered  
 ISBN 0 9508575 2 1  
 Chapters 12  
 Price £3.60 inc. UK postage

As I write, the fifth edition of this useful book is going to press. It is up-to-date until October 1987, which must make it one of the best sources of information around at the moment. It is called *The Listener's Check-list and Guide to European Broadcasting*, which seems an accurate description.

The new edition will contain many of the old features as well as some additions. The chapter on making the most of your portable has been rewritten now complete with diagrams. It has always contained very useful information for those using these simple sets, which gives you a better chance of improving your results. There is lots of practical advice like, "reception is better the higher your set (or antenna) is. A portable



in an upstairs room, near a window if possible, is much more reliable than on the ground floor".

There is a British Isles map mounted inside the back cover and a Europe and Mediterranean map inside the front. These maps give the locations of the various broadcasting transmitters.

The section called Spot the Tune has been reduced in size this

time, to make room for more popular information. It is only useful to those who can read music as it provides the signature tunes and interval signals from some of the international broadcasters.

Another addition to the book is the details of the amateur bands and the North American medium wave to the Broadcast Bands section. This should now make this a very comprehensive chapter as previously only the long wave, medium wave, short wave, v.h.f., u.h.f. and s.h.f. bands were included.

One point to note is that times of broadcasting in this book are given in British Time. Listeners in most European countries will be one hour ahead of this time for most of the year. However, Europe puts the clock back before Britain does, so that times are the same as the UK for about a month (end of September to end of October). This is an interesting time, especially in late evening, as times of close down, fading and interference are different from

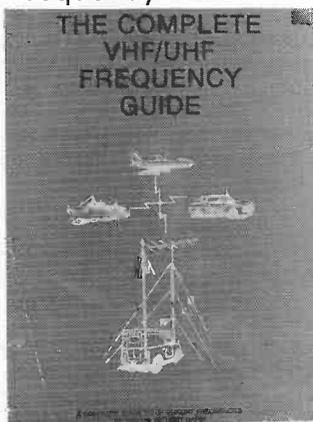
usual. Who knows: what you would be able to hear.

The book is available from **George Wilcox, 9 Thurrick Close, Eastbourne BN20 9NF** from mid-December onwards.

- Chapter 1** Introduction
- Chapter 2** Frequency Bands
- Chapter 3** Medium Wave: Europe, Index, British Isles, Index (locals)
- Chapter 4** Longwave
- Chapter 5** VHF (f.m.)
- Chapter 6** Shortwave
- Chapter 7** Using the Dial Search Maps
- Chapter 8** Making the most of your portable
- Chapter 9** Spot the Tune
- Chapter 10** Classical music & jazz
- Chapter 11** Broadcasts in English
- Chapter 12** Programme Notes

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 Author Bill Laver  
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 Pages 60  
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 The Future of VHF/UHF  
 Communications  
 Frequency Guide 26 to  
 117.9MHz

## Science Fair AM Short Wave Radio Kit

Cat No. 28-176  
 Price £11.95

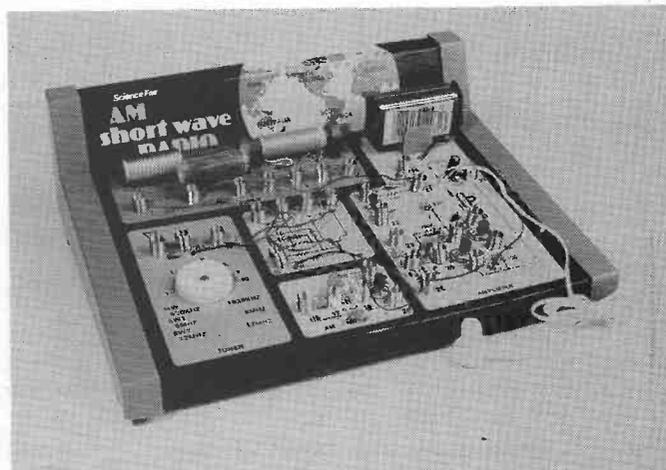
The AM Short Wave Radio Kit from Tandy is a simple kit for the youngster with a budding interest in radio and electronics. The radio has three bands covering 520kHz - 1625 kHz, 6MHz - 8MHz and 12MHz - 17MHz. The method of construction is simple but unusual and comprises two plastics end pieces with a heavy duty cardboard chassis which is overprinted with the circuit diagram. The interconnections are made using spring terminals which are inserted in the cardboard chassis and line up with the connection points on the circuit diagram. The kit contained a plentiful supply of colour coded and stripped connecting leads as well as the main components which saves extra expense. The only thing that needs to be supplied is a battery.

The whole unit uses 3

transistors, 8 resistors and 8 capacitors to complete the kit and there is a small 2-transistor amplifier to boost any signals once found.

The only tools required to build this are a small Phillips screwdriver, a pair of long nosed pliers and a pair of wire cutters. The handbook is clearly written and first describes briefly what happens when the constructor finds a station on their radio. Then there is a very clear parts list with the components illustrated to prevent mistakes being made with electrolytic capacitors and transistors. In each case the circuit symbol is given by the side of the illustration which is a good teaching aid. Unfortunately the capacitors look slightly different as these kits are supplied mainly for the US markets - but that's not too great a problem.

The method of construction is following step by step through the instruction book "ticking" the



stages as they are completed. No soldering is required which reduces the risk of accidents without removing the fun of building your own projects.

The project you see in the photograph was successfully built by Emma Mackie, a bright 9-year

old. So that gives an idea of the suitability of the kit for enthusiastic youngsters. That's not to say some of the older readers may not want to have a go! The kit is available **in most Tandy stores** and was kindly loaned by the local Poole branch.

# IDEAS FOR CHRISTMAS

## Goodmans ATS-801

<b>Coverage</b>	
l.w.	155-281kHz
m.w.	530-1620kHz
s.w.	5.8-15.5MHz
f.m.	87.5-108MHz (stereo into stereo headphones)
<b>Power</b>	4 x 1.5V AA batteries or 6V d.c. supply 3V Silver Oxide back-up battery
<b>Audio</b>	60mm speaker and light-weight headphones supplied
<b>Antenna</b>	860mm telescopic antenna supplied
<b>Tuning</b>	
l.w.	1kHz steps
m.w.	1kHz steps
s.w.	5kHz steps
f.m.	50kHz steps
<b>Weight</b>	580g
<b>Dimensions</b>	112 x 180 x 30mm
<b>Price</b>	£85

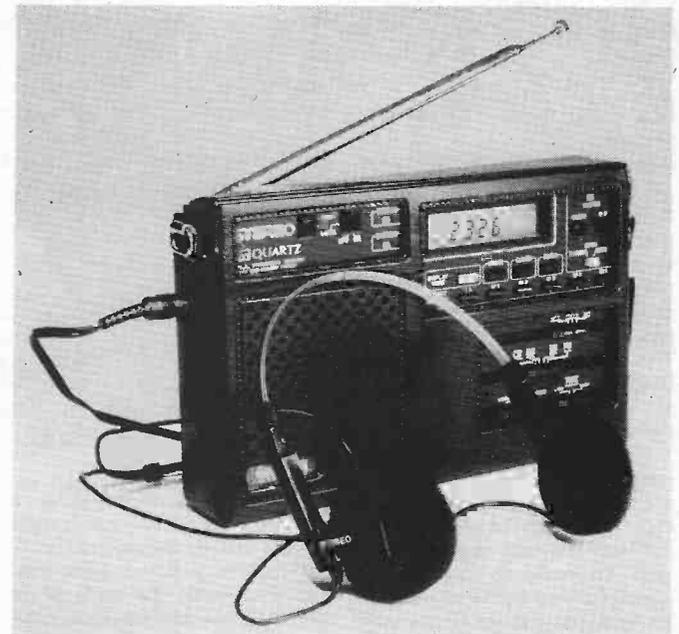
The ATS-801 is a rather up-market portable radio featuring digital microprocessor control at the heart of all operations. Don't be misled by its small physical size as it is packed with features. The initial impression is of a nicely engineered and well presented piece of equipment. The controls were very clearly marked and operation was possible without having to read the well presented manual.

The liquid crystal display (l.c.d.) on the front panel is very clear and always active. When the radio is switched off the display shows the current time in 12-hour form with a.m. or p.m. clearly marked as appropriate. As soon as the

radio is turned on, the display changes to show the frequency in MHz or kHz depending on the band selected at the time.

The band selection was very simple and comprised a four-position slider switch to select either long, medium, short or v.h.f. band. To manually set a frequency the band is first selected and then the frequency can be altered in steps by pressing either the up or down tuning buttons on the front panel. If you want to tune quickly then these buttons can be held down. The only problem I found when fast tuning is that the audio is muted, except for a "beep" at each tuning step. This, of course, means that the only indication you have as you tune past a signal is when the tuning indicator i.e.d. lights. An additional tuning facility is incorporated in the form of an automatic scan routine. This is turned on by a small switch in the front panel and the scan is started by holding down either the up or down tuning button for a couple of seconds. Once the scan has started it will continue until a signal is found that exceeds the factory pre-set threshold. I thought the scan was very effective on v.h.f. and on the medium and long wave bands during the day. At night, the automatic scan was less successful as the congested state of these bands meant that the scan was always stopping on the myriad of miscellaneous signals.

One of the spin-offs of microprocessor control is that programmable memories are easy to implement. The ATS-801 has a total of 25 memories available which is very good. The memories are very well organised as 10 on the short wave band and five each on the three other bands. The programming of these memories is wonderfully simple which means

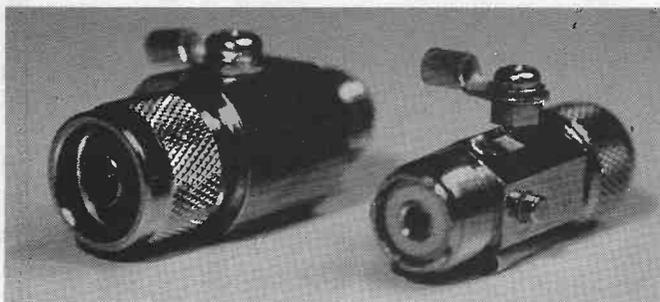


that they are likely to be well used. Goodmans have also included a separate battery back-up for the memories, so you don't lose the memories when you change the radio batteries which is useful. Whilst discussing programming I ought to mention that the clock is rather more than just a simple clock. It has a timer facility which allows you to pre-programme when the radio switches on and off time which means it could be used as a radio alarm if required. The final timer facility is the sleep button which turns the radio on for 60 minutes and is designed for those who like to drift off to sleep with some background music. With all these programmable facilities you will be pleased to hear that the keyboard can be locked to prevent accidental operation of any of the push buttons.

As can be seen from the frequency coverage, this is essentially a broadcast station receiver and as such it performed very well. The sound quality was very good particularly when listening on v.h.f. using the supplied stereo headphones. When listening on short wave the telescopic antenna needs to be extended for best results. One novel little extra is a pair of metal legs on the base of the cabinet which can be folded out to give increased stability when using the set on a flat surface. The only snag being that these feet could not be used when the radio was mounted in the supplied vinyl case.

The radio was loaned by **Johnsons Shortwave Radio, 43 Friar Street, Worcester WR1 2NA. Tel: (0905) 25740.**

## Lightning protection



Here are two useful devices from SMC Ltd. Lightning and static discharge protection is an area worthy of some extra thought in view of the expensive equipment that many of us connect to our antenna systems. The first point to make clear is that there is nothing on the market that will protect your equipment from a

direct lightning strike! Protection can however be provided from voltages that may be induced into your antenna system by nearby static discharges. The type of protection available falls basically into two categories. The first is the simple spark gap device which relies on dissipating any induced voltages in a controlled spark gap

**SMC566** £2.99 plus 75p P&P  
**2150** £20.53 plus 75p P&P

in the antenna lead. The SMC 566 lightning arrestor falls into this first category and comprises an in-line SO239/PL259 connector with an in-built spark gap. The main body of this connector also has an earth lug which should be wired to a low impedance earth with as heavy a gauge of cable as possible. The disadvantage of this type of protection is that the breakdown voltage of the spark gap is poorly defined and generally on the high side which results in an unpredictable level of protection. The big advantage of course is price as this type of protector is generally about a quarter the price of the more sophisticated gas discharge devices.

This second and more expensive type of protection is provided by gas discharge devices. These units provide a tightly controlled environment for

discharging any high voltages that may be present on the antenna system. The heart of the protector is a gas filled cartridge connected between the inner and outer of the co-axial antenna lead. The 2150 from SMC Ltd. is a good example of this type of protector and is housed within an in-line male to female N connector. As with the simpler protector mentioned earlier, an earth lug is provided which must be connected to a good earth with heavy gauge cable. This particular connector is of very high quality and its prime use would be for protecting v.h.f. or u.h.f. equipment and is to be recommended for users of externally mounted discones.

More about these products can be obtained from **SMC Ltd., SM House, School Close, Chandlers Ford Ind. Est., Eastleigh, Hampshire SO5 3BY.**

# IDEAS FOR CHRISTMAS

## Goodmans SG-789L

<b>Coverage</b>	
l.w.	150 – 281kHz
m.w.	522 – 1620kHz
s.w.1	5.80 – 6.20MHz
s.w.2	7.05 – 7.50MHz
s.w.3	9.45 – 9.90MHz
s.w.4	11.55 – 12.05MHz
s.w.5	15.05 – 15.50MHz
s.w.6	17.45 – 18.05MHz
s.w.7	21.45 – 21.95MHz
f.m.	87.5 – 108MHz (stereo into stereo headphones)
<b>Power:</b>	3 x 1.5V AA batteries or 4.5V d.c.
<b>Audio:</b>	70mm speaker and light-weight headphones supplied
<b>Antenna:</b>	690mm telescopic antenna
<b>Tuning:</b>	Rotary tuning
<b>Weight:</b>	400g
<b>Dimensions:</b>	89 x 174 x 30mm
<b>Price:</b>	£39.95

### Operation

Although this receiver was only used for a short period I found that it performed very well and would make a very handy portable for the traveller. It could also be very useful if you're trying to find an "ideal" present for someone interested in all kinds of broadcast

radio reception. Whether listening to Radio One in stereo (using the stereo headphones) or Voice of America on 11.94MHz the audio quality was surprisingly good. The general operation of the radio was very easy with all controls having a good positive feel.

The tuning of signals was helped by the built-in tuning indicator, which comprises a l.e.d. on the front panel. This indicator glows brighter as the signal gets stronger giving a very clear indication of the best tuning point. For those of you considering this radio for a younger member of the family, you will be delighted to learn that the stereo headphones are included with the radio. Seriously though, the headphones were comfortable and produced a very pleasant sound quality which was at its best when listening to a stereo transmission on v.h.f. The presence of a stereo signal is indicated in the conventional way by a red l.e.d. glowing on the front panel. If you want to use mono headphones then a switch has been provided to manually switch from stereo to mono.

Moving on to the short wave bands, all the main broadcast sections are adequately covered in seven separate bands. The tuning dial shows the band number and the common band name in metres, i.e. 49m, though the dial is calibrated in MHz. On the review model the dial calibration was



about 5% out, but this is not uncommon on a portable receiver. As the broadcast bands are covered in seven segments the main tuning becomes more akin to a bandspread dial. This greatly eases tuning on the very congested band conditions found after dark.

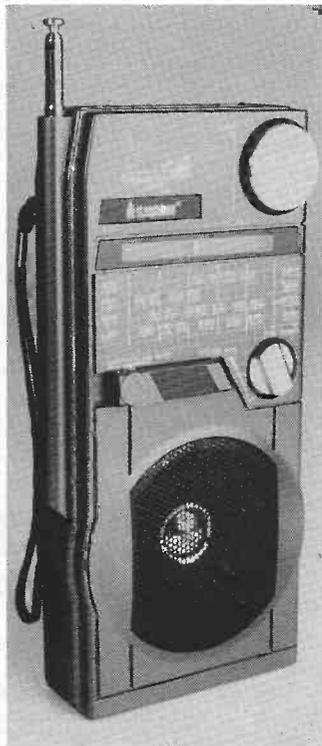
Most shortwave broadcast signals seem to suffer from quite severe fading, so it was good to see that the automatic gain

control on the SG-789L coped well with the majority of signals. It can be quite a nightmare sorting out all the signals after dark as on some receivers there seem to be at least two stations on each frequency. The SG-789L makes comparatively easy work of this as the selectivity is well defined.

The receiver was loaned by **Johnsons Shortwave Radio, 43 Friar Street, Worcester WR1 2NA. Tel: 0905 25740.**

## Steepletone SAB9

<b>Coverage:</b>	
l.w.	150 – 270kHz
m.w.	540 – 1600kHz
f.m.	88 – 108MHz
Airband	110 – 130MHz
<b>Power</b>	4 x 1.5V AA cells or ext 6V d.c.
<b>Audio</b>	70mm speaker or earpiece supplied
<b>Antenna</b>	615mm telescopic antenna supplied
<b>Tuning</b>	Rotary tuning (coarse and fine tune).
<b>Weight</b>	500g (with batteries)
<b>Dimensions</b>	100 x 208 x 45mm
<b>Price</b>	£19.95



Fortunately this radio is very easy to use as the instruction book consists of a two page booklet 130 x 150mm. The instruction leaflet covers the basics of fitting batteries and control functions — all you need to know.

The physical layout of the receiver is optimised for hand-held use and I must admit it was quite a nice fit in my hand. The front panel is quite straight forward and comprises a slide switch to select the band, rotary volume/on-off

and a rotary tuning control. The tuning control is actually mounted on the right hand side of the radio and is best used as a thumb-wheel control. The only other control is the fine tuning which is a thumb-

wheel on the right-hand edge of the radio. One point worth noting is that all the controls are very nicely laid-out for right-handed users and may prove to be rather awkward for a left-handed person.

The tuning dial is a little unusual in that the frequency markings are printed on the front panel and the dial pointer is visible through a transparent panel immediately above the markings. Although unusual, the dial calibrations were easy to read and the airband scale was located closest to the dial pointer which was good.

The performance on the medium and long wave bands was adequate for general local listening. I thought that the sound quality from the 70mm speaker was quite pleasant for a handheld radio.

The v.h.f. and air-band are actually one band, although the dial markings are split in two. The v.h.f. broadcast section covers the normal frequency range and turned in a good performance. The audio quality when tuned to broadcast stations was good, if perhaps a little on the bright side. The sensitivity was not measured but seemed to be quite good. I mentioned earlier that the air-band coverage is actually a continuation of the v.h.f. broadcast band, this presents a couple of slight

problems. First is that to receive broadcast stations a bandwidth in the order of 75kHz is required, whereas 10kHz is adequate for air-band. The second snag is that air-band transmissions use amplitude modulation and broadcast signals use frequency modulation. Having pointed out the problems I am pleased to say that this receiver manages to perform remarkably well on the air-band. Without going into too many complications the a.m. signals can be resolved by tuning slightly to one side of the wanted signal. I didn't find any problems using this technique and the fine tune control made it very easy to find the optimum tuning point. The bandwidth problems show up by several adjacent transmissions being audible at the same time, but this is only really a problem if using the receiver close to a busy international airport. The tuning scale on the air-band was quite short (about 25mm) but this did give the advantage of being able to quickly scan the whole band.

Overall this would make a good first radio for someone interested in aircraft communications.

The Steepletone SAB9 was kindly loaned by **Johnsons Shortwave Radio, 43 Friar Street, Worcester WR1 2NA. Tel: (0905) 25740.**

# RADIO IN AUSTRALIA — THE BEGINNING

G. E. W. Hewlett

Marconi, in Newfoundland, successfully read signals sent from his station in Cornwall, on 12 December 1901. Although many scientists in a number of countries were carrying out experiments in wireless telegraphy, he has perhaps the best claim to be the inventor of wireless.

He patented his apparatus in London, and formed the Wireless Telegraph and Signal Company (later Marconi Wireless Telegraph Company).

## Wireless Experiments

In Australia the first recorded wireless experiments were being conducted as early as September 1897, by Charles Todd (famed for his work on overland telegraph lines) and his son-in-law, Professor William Bragg, of Adelaide University, but although successful their signals did not cover a great distance.

When the Duke of York (later King George V) visited Australia to open the first Federal Parliament in 1901, signals were exchanged between shore stations, both at Melbourne and at Hobart, and the naval ships escorting the royal vessel.

The date: 23 November 1923. The time: 8pm. The place: Sydney, Australia. It was on that night that a radio station, 2SB (later 2BL) broadcast a programme of light entertainment: Australia's first regular broadcast. The story of Australian radio, however, goes back beyond that date.

Experiments continued and, in July 1906, the first wireless communication between land stations in Australia was made between Point Lonsdale (S. Vic.) and Devonport (N. Tasmania), a distance of nearly 300km, the stations being established by the Marconi Company.

Then came the first official association between the Post Office and wireless. The Wireless Telegraphy Act was passed to bring about order and control of radio, requiring all stations to be licensed, the Post Office being made responsible for its administration.

A U S T R A L I A

RADIO

NEWS, INFORMATION & ENTERTAINMENT IN

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INDONESIAN

---

CHINESE

---

ENGLISH

---

FRENCH

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NEO-MELANESIAN

---

JAPANESE

---

THAI

---

VIETNAMESE



By the outbreak of World War One, 19 stations were operating around the Australian coast providing ship-to-shore communication. In 1917 a German wireless message was intercepted at the Applecross (W. Australia) station. For the duration of the war administration of the Act was passed to the Navy, the Post Office resuming responsibility when hostilities ceased.

## Direct Transmissions

In September 1918, the first direct transmission between the UK and Australia was sent by the Marconi Company from Caernarvon, in Wales, and received in a Sydney suburb.

Until now transmissions were mainly in Morse code, but by 1919 wireless telephony was on its way with the first public demonstration being given by the Royal Society of New South Wales in August 1919. Then followed a series of weekly concerts in experimental broadcasts in Melbourne in 1921. □

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**VLW 6**

Station at Perth

6.0am Noon 6.0pm Midnight

**VLW 9**

Station at Perth

IDENT	FREQ.	METRE BAND	POWER	TIME		DAY
VLW 6	646 KHZ	48	10 KW	5.0AM - 9AM 6.30AM - 9AM	5.41PM - MIDNIGHT 5.41 PM - MIDNIGHT	MON-SAT EVERY DAY
VLW 9	960 KHZ	31	10 KW 50 KW 10 KW 50 KW	5.0AM TO 5.30AM TO	5.55PM 6.00PM - MIDNIGHT 5.55PM 6.00PM - MIDNIGHT	MON-SAT MON-SAT SUNDAY SUNDAY
VLW 15	5425 KHZ	19	50 KW	7.0AM TO	9.41PM	EVERY DAY

# SCANNING

Alan Gardener

Over the past few years the communications market within Britain has been restricted by the lack of available spectrum, preventing growth and the development of new systems.

With increasingly advanced techniques and the recent release of a large chunk of the spectrum previously allocated to broadcasting, this position is now changing.

## Private Mobile Radio

It is perhaps worthwhile outlining the present position within Britain. Private Mobile Radio (p.m.r.) is the general term applied to privately owned business radio communication systems. Until recently this was generally split into a few main allocations. (see Table 1).

The terms Simplex and Duplex refer to the type of operation permitted in each sub-band. Simplex operation is where both the base station and mobile transmit on the same frequency. This means that each operator has to take it in turn to transmit in order to hear the other person — unlike, say a normal telephone conversation. Simplex operation is normally only permitted for low power stations operating within a well defined area, a factory or park for example.

Duplex (or more correctly in this case, dual frequency Simplex operation) is generally the preferred type of operation. In this case the base station transmits on one frequency to the mobile, and receives replies from the mobile on a separate frequency. Normally this second frequency is paired with the first in some fixed manner.

Again the operators have to take it in turns to speak to each other as in the Simplex case. In some cases though the base station operator can still listen to the mobiles whilst transmitting, although the individual mobile stations can still only transmit or receive at any instant in time.

**Hello and welcome to this new column in which I will include items of interest for those people owning scanning receivers, and also feature some of the more interesting new developments in the fast moving world of commercial radio communications.**

This is referred to as Semi-Duplex operation. Full Duplex operation is where both operators can transmit and receive simultaneously, this is generally only used when a system is capable of being connected to the telephone network. Use of this type of operation is very well controlled by the DTI, as it tends to tie up radio channels for extended periods. This is particularly important in cities where frequencies have to be re-used.

Why, then, you may ask is Dual Frequency Simplex operation preferred against Simplex, when at first sight it appears to offer few advantages.

Well, if you consider that most base stations are located on high ground in order to maximise their coverage area, if a single frequency Simplex system was used, the geographical separation between stations using the same channel would have to be much larger than that for a dual frequency Simplex system. This is because the well located base stations would be able to receive each other well outside the intended coverage area for the mobiles. Because all the base stations are transmitting on a different frequency from receive the coverage is restricted to that of the mobiles, and so the frequencies can be re-used more frequently than would be possible otherwise.

The other aspect of dual frequency Simplex operation is that it makes it

possible to install several systems at one site without undue interaction between equipments. Imagine the case of two base stations co-sited and operating on adjacent channels. In the case of a single frequency Simplex system, each time one of the transmitters operated the high level of r.f. induced into the other system's receiver at close to the wanted frequency would cause overloading to occur. The additional isolation provided by the increased frequency separation in a dual frequency Simplex system helps to reduce this problem.

I hope that this gives a general guide to the more standard types of p.m.r. systems — watch future columns for details of more sophisticated systems.

**Table 1**

PMR Allocation		Base TX (MHz)	Base RX (MHz)
"LOW" Band	Duplex	85.000	71.500
		to	to
		86.300	72.800
	Simplex	86.3000	86.300
to		to	
	86.700	86.700	
Duplex	86.950	76.950	
	to	to	
	88.000	78.000	
"MID" Band	Duplex	138.000	105.000
		to	to
	141.000	108.000	
"HIGH" Band	Simplex	168.950	168.950
		to	to
		169.850	169.850
	Duplex	169.850	165.050
to		to	
	173.050	168.250	
"UHF" Band	Duplex	440.000	425.500
		to	to
		443.500	429.000
		445.500	425.000
		to	to
		446.000	425.500
Simplex	446.000	446.000	
	to	to	
	446.500	446.500	
Duplex	448.000	431.000	
	(London only) to	to	
	449.000	432.00	
Duplex	453.00	459.500	
	to	to	
	454.000	460.500	
Duplex	456.000	461.500	
	to	to	
	457.000	462.500	





# SCANNING

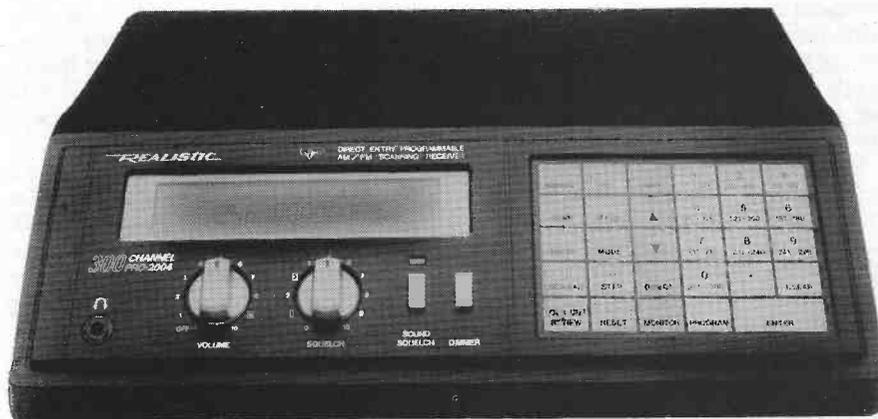
version which can interface directly with a TV monitor will become available. Current cost of the unit in the US is \$350 so expect about the same price in £s when it reaches these shores.

## Interception of Communications

The discussions regarding the Electronic Communications Privacy Act in the US have many parallels with the Interception of Communication Act in Britain. It is interesting to note the many claims and counter claims now floating around the American Senate. The main pressure for restrictions on what can, or cannot be legally received has come from the powerful cellular radio lobby, this has resulted in a proposed limitation on listening to certain types of radio traffic, which when viewed against the American ideal of freedom is seen as the first nail in the coffin of the so-called utility monitoring.

The situation seems strange in that, by passing such laws, the government expects that people will be dissuaded from listening. Nothing has changed with the introduction of cellular radio, it was possible to listen to radiotelephone conversations on the older systems, but only now do the system operators seem to have realised this.

Surely if people are going to take advantage of anything they hear, then breaking one further law is not going to



stop them. No radio system is totally secure, but modern electronics make it easy and inexpensive to provide some form of secure speech, which would make casual listening difficult. In this context the system operators seem to have favoured the easy way out.

*definitions.* Home Office ISBN 0 11 340729 7

*Handbook for Private Mobile Radio Users.* Home Office. ISBN 0 11 340060 8.  
*UK Table of Radio Frequency Allocations.* Department of Trade and Industry. ISBN 0 11 513819 6.

## Books

Each month I will try to include the titles of books which I hope will give readers of this column a further insight into some of the topics covered. So to start off this item good general guides to both p.m.r. and similar allocations are the following HMSO publications.

*Revised International Table of Frequency Allocations and associated terms and*

## Feedback

This is your column as well! So I would be glad to receive any contributions, questions, criticisms, suggestions or just plain cries for help, anything in fact connected with the topics featured this month. So how about it? All mail to PO Box 1000, Eastleigh, Hants SO5 5HB. If you require items returning please enclose an s.a.e.

# SELCALS

◁19

aircraft contacting them but if the plane is not on a constant listening watch the SELCAL system will be used.

## Oceanic Control

Oceanic control north of latitude 46 degrees north and south of 61 degrees north is shared between two centres. To the east of 30 degrees west is controlled by Shanwick, situated at Ballygreen, in the west of Ireland, and west of 30 degrees west is controlled by Gander, situated in Newfoundland, Canada. North of 61 degrees north is under the control of Iceland as are the polar tracks and south of 46 degrees north by Santa Maria in the Azores.

## Radio Frequencies

The radio frequencies which are allocated to Shanwick, Gander, Iceland and Santa Maria for the North Atlantic routes are divided into four groups which cover the major zones.

**NAT A** Covers aircraft flying on the Southern tracks including flights worked by Shanwick and Santa Maria Controls.

**NAT B** Central and Northern tracks for aircraft registered west of 30 degrees west. (e.g. American aircraft).

**NAT C** As at NAT B but for aircraft registered east of 30 degrees west. (European registered aircraft).

**NAT D** Northern routes outside organised tracks. These included the polar routes.

### Frequencies

NAT A 3016 5598 8825 13306  
NAT B 2899 5616 8864 13291  
NAT C 2962 5645 8879 13306  
NAT D 2971 4674 8891 13291

Each control uses a primary frequency with a back-up secondary for use when the reception is poor or fading. For most of the year, the two middle frequencies for each zone are used Shanwick Oceanic

using the 5m band as a primary and 8m for the secondary or back up. At 30 degrees west the aircraft changes over to the Canadian control at Gander with the primary becoming the 8m band when the 5m acting as the secondary frequency. At very busy periods, the secondary frequency may be used for progress reports and SELCAL checks but this is the exception rather than the rule.

## Flights over the Atlantic

Flights over the Atlantic were developed in a track system. It was designed to cope with airline timetables which have all the aircraft going the same way at given times to avoid congestion. So therefore the bulk of the transatlantic flights leave on the west bound tracks travelling to Canada and the United States between the hours of 1100 to 1500UTC and travel in the opposite direction between 0100 and 0700UTC.

# STARTING OUT

Brian Oddy G3FEX

Broadcasters use radio waves to convey information contained in the sounds produced by the human voice, musical instruments and other man-made or natural things. These sounds may vary in pitch (frequency) and intensity (amplitude) and the overall effect may be derived from more than one sound.

Because sound plays such a key role in broadcasting it is important to understand the nature of sound waves and the methods used to superimpose sounds onto radio frequency "carrier" waves at transmitting stations, so that they may be received in distant places.

## Sound Waves

Sound waves consist of alternating, low frequency compressions and rarefactions of the air, and travel at a speed of 1200km/hr. A perfect human ear responds to audio frequencies (a.f.) which lie within the range 10Hz to 20kHz; however, some animals can respond to much higher frequency (ultra-sonic) noises.

## Differences

It is very important to appreciate that despite the apparent overlap in the audio and radio frequency (r.f.) ranges between 10 and 20kHz, the nature of the two kinds of waves is quite different. Radio waves consist of electric and magnetic fields and travel at 300 000km/s (see Starting Out, *SWM* April '87). No wonder, then, that a person with very good hearing cannot hear the 16kHz signals broadcast by GBR from Rugby when driving past it on the M1!

The sounds which originate in a studio of a BC centre, or at an outside event, are either picked up by a microphone or reproduced from sound information stored on disc or tape. Like the human ear, a microphone responds to the compressions and rarefactions of the air, but converts them into tiny electrical currents which are then amplified to a predetermined peak level before being sent along specially equalised audio lines to the transmitter.

## Modulation

When the audio signals arrive at the transmitting station they are further amplified and then superimposed onto an r.f. "carrier" wave generated within the transmitter by a process called **modulation**. The combined signal is then radiated by the station's antenna. The modulation process may take various forms, but two systems are often employed by broadcasters — **amplitude modulation (am)** and **frequency modulation (f.m.)**.

Each method has advantages and disadvantages, but on the crowded long, medium and short wave bands the most important consideration is the amount of band space required by the modulated signal. The a.m. system is used on these

bands because several a.m. broadcasts could take place in the amount of space required by a single wide-band f.m. transmission. The much wider v.h.f. bands are well suited to f.m. transmissions and extensive use is made of them to provide a high-fidelity broadcast service, but they will not be considered here.

Amplitude modulation is essentially a mixing process and is usually carried out at high power levels in the final stages of BC transmitters. When an audio signal ( $f_m$ ) is mixed with an r.f. carrier ( $f_c$ ) in a non-linear device, it can be shown that additional frequencies above and below the carrier are produced: these are called **side frequencies**, and consist of  $f_c + f_m$  and  $f_c - f_m$  (see Fig. 1a). Provided the amplitude of the modulating audio signal ( $f_m$ ) does not vary, the amplitude of the side frequencies will remain constant.

## Sidebands

If the frequency of  $f_m$  is increased, then the side frequencies move further away from the carrier. If more than one modulating frequency is present, then a band of frequencies results above and below the carrier; these are called the **upper and lower sidebands** — see Fig. 1b. If the frequency and amplitude of  $f_m$  varies (as in speech), the amplitude and frequency of the sideband frequencies will also vary. It should be noted that the sidebands are actually mirror images of each other and that it is the sidebands which carry the modulation information.

Irrespective of whether or not modulation is present the carrier remains

constant, and actually carries no information, but is required as a reference by a receiver for the demodulation process.

If all this seems a little confusing, consider a practical example with a carrier ( $f_c$ ) operating on a frequency of 1500kHz. If the modulation frequency ( $f_m$ ) is 1kHz, then the upper sideband frequency will be  $1500\text{kHz} + 1\text{kHz} = 1501\text{kHz}$ , and the lower sideband frequency will be  $1500\text{kHz} - 1\text{kHz} = 1499\text{kHz}$ . If a higher frequency of 5kHz is added to the modulating audio, that will result in an additional upper sideband frequency of  $1500\text{kHz} + 5\text{kHz}$ , and an additional lower sideband frequency of  $1500\text{kHz} - 5\text{kHz} = 1495\text{kHz}$ , being present.

The layout of a simple a.m. transmitter (Fig. 2a) and the associated waveforms present at each stage (Fig. 2b) can be seen. A **master oscillator (m.o.)** generates a low level r.f. signal "A" at the desired carrier frequency. The output from the m.o. is then amplified by a power amplifier (p.a.) before being passed to the antenna and radiated.

The incoming audio signal from the studio centre "B" is amplified sufficiently to enable it to drive an audio power amplifier, called the **modulator**. The audio output from the modulator appears across the secondary of the modulation transformer where it is applied in series with the high tension supply to the p.a.

If no audio is incoming from the studio centre, an unmodulated or plain carrier will be radiated by the antenna; note that the r.f. signal voltage shown at "C" is constant. When audio is present the waveform depicted at "D" results, which contains the carrier ( $f_c$ ) and the sidebands ( $f_c + f_m$  and  $f_c - f_m$ ); it is called the **modulation envelope**.

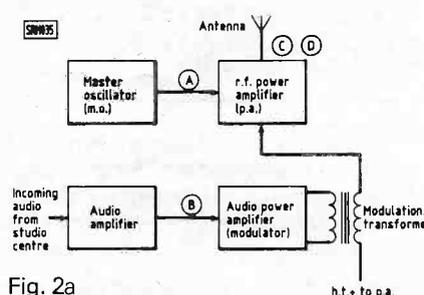
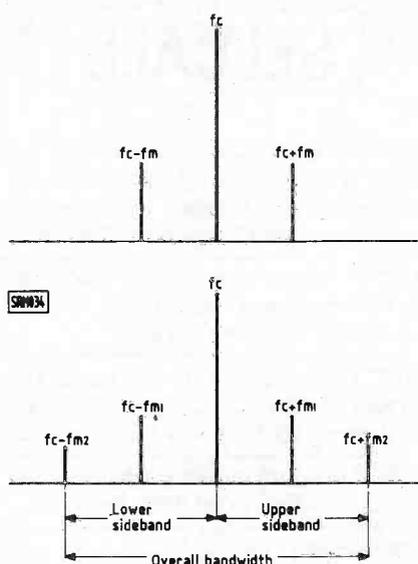


Fig. 2a

## Modulation Depth

When the audio causes the peak r.f. signal

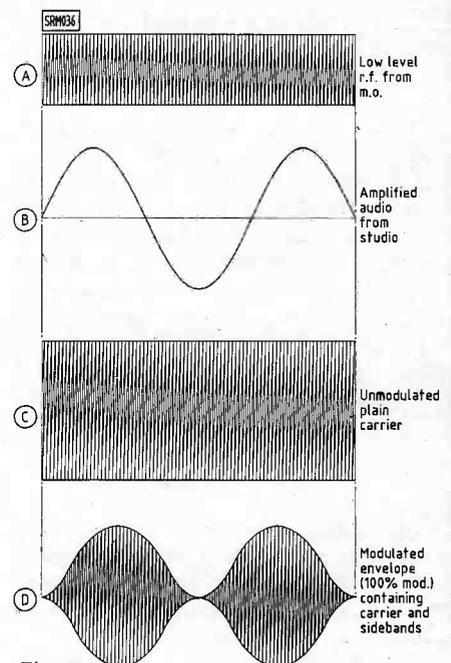


Fig. 2b

## STARTING OUT

voltage to vary from zero to twice the unmodulated value the transmission is said to be fully modulated.

The r.f. power will then vary from zero to four times the unmodulated value, since power varies as the square of the voltage. Any further increase in audio would result in distortion and spurious sideband signals being generated; these would cause interference to broadcasters on adjacent channels. The degree, or depth, of modulation is usually expressed as a percentage of the maximum value.

The audio output of an a.m. receiver is related to the depth of modulation, so it is desirable to keep the modulation percentage as high as possible in order to

improve intelligibility. The ratio of the loudest and quietest audio at the studio centre is called the **dynamic range**, and at many s.w. transmitting stations the dynamic range of the incoming audio is compressed to improve intelligibility of the quiet passages. The loudest passages of audio are limited to a preset level and any peaks that exceed this value are clipped off to avoid overmodulation.

The space taken up in the r.f. spectrum by a modulated transmission is called the **bandwidth** of the signal. In the case of an a.m. transmission this is equal to twice the highest modulating frequency. In the example the highest modulating frequency is 5kHz, so the signal will occupy a

band extending from 5kHz below to 5kHz above the carrier, namely from 1495 to 1505kHz — thus giving a bandwidth of 10kHz.

When an a.m. signal is radiated via the ionosphere to some distant location, the paths taken by the upper and lower sidebands may be slightly different. This causes delays or **phase errors** in the components of the signal and results in a form of audio distortion in the demodulated signal called **phase distortion**. This type of distortion is most noticeable during periods of fading of the transmitted signal, so try listening to a s.w. signal which is fading and see if you can detect the phase distortion! □

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# SEEN & HEARD

At the time of writing, radio amateurs and s.w.l.s in this country are divided in two — those who have their antenna still in the air, and those who have lost antennas, towers, sometimes even roofs. Clearly, nothing can save an antenna onto which a tree, or next-door's garden shed, is blown. On the other hand, many antennas came down for no better reason than that the wind blew. Regular maintenance is a good idea because even if the beast doesn't fall down, the ingress of moisture for instance can cause a slow but progressive deterioration.

So — what to do? In terms of initial design engineering remember that everything must be in proportion: to use a great big Pyrex insulator with a 28 s.w.g. (0.38mm) wire is asking for the first wind to fetch everything crashing down. Likewise, to use thin string with a dipole made of 10 s.w.g. (3.2mm) wire is equally daft. My "Best Bent Wire" of 28 s.w.g. survived happily, simply because I have NO insulators; it is tied up with clear nylon monofilament fishing line, and a length of this has in fact a longer insulating path than a conventional insulator. For a centre-fed dipole or G5RV type, one has to add to the equation the weight of the feeder. You are now straining to reduce the sag, and a moment's consideration of the Triangle of Forces shows the pull on the wires is far more than the mere weight of the feeder; whence it is always preferable to support a centre-fed device at the feedpoint, and so take the load off the wire and end-supports.

As to maintenance, there are several things one can do; drop the whole works, masts and all for checking, at least every couple of years. The masts can be completely checked over, looking particularly at the joints between sections, and all nuts and bolts given a good dose of lanolin-based grease. A clean-up and a lick of paint to protect from corrosion, and a particularly close look at any place where two dissimilar metals come into proximity: such a case might be a couple of aluminium mast tubes, joined with a sleeve of plated steel and maybe stainless steel bolts. In such cases the weather will not just generate rust, but will result in serious electrolytic corrosion if the dissimilar metals are at opposite ends of the Corrosion Table. There is a Corrosion Table in the RSGB *Radio Data Reference Book*, Fourth Edition, p.164, and presumably in later editions; for more detailed information you can refer to the DEF Standard.

Turning to the feeder, you can examine it for signs of chafing along its whole length, and for indications of moisture ingress through non-waterproof

## AMATEUR BANDS ROUND-UP

Justin Cooper

c/o Short Wave Magazine, Enefco House,  
The Quay, Poole, Dorset BH15 1PP

### All-Time Post War HPX Ladder

Name	Last Mth	Prefixes This Mth
<b>Phone Only</b>		
B. Hughes (Harvington)	3269	3309
E. M. Gauci (Malta)	3207	3224
E. W. Robinson (Felixstowe)	2600	2623
H. M. Graham (Chesham)	1932	1932
M. Ribton (Gillingham)	1867	1856
M. Rodgers (Bolton)	1811	1818
P. Oliver (Paisley)	1730	1730
N. Henbrey (Northiam)	1561	1592
F. Dunn (Chester)	1566	1566
P. Davies (Market Drayton)	1442	1442
B. Patchett (Sheffield)	1207	1207
C. R. Eve (Jersey, C.I.)	878	1009
A. P. Lincoln (Aldershot)	888	888
R. G. Williams (Borehamwood)	857	874
D. R. J. Hughes (Alderley Edge)	771	771
S. Field (Barningham)	735	735
L. Marcquardt (Hereford)	629	629
A. Vest (Durham)	605	605
N. Fox (Wakefield)	595	595
A. Woodcock (Denmark)	603	603
<b>CW Only</b>		
F. Dunn (Chester)	2035	2035
H. Scott (Rievaulx)	1396	1396
N. Melville (Edmonton)	1174	1181
P. J. Barnes (Blackpool)	New	393
C. R. Eve (Jersey, C.I.)	306	323
M. Rodgers (Bolton)	237	268
<b>RTTY Only</b>		
A. P. Lincoln (Aldershot)	547	547
W. J. Prior (Lochcarron)	501	515
C. R. Eve (Jersey, C.I.)	474	492
N. Henbrey (Northiam)	334	334
M. Rodgers (Harwood)	251	251

Starting score, 500 for Phone, 200 for CW or RTTY. Entries in accordance with HPX Rules.

### Annual HPX Ladder Starting date January 1, 1987

Name	Last Mth	Prefixes This Mth
J. J. Sales (Lancaster)	450	450
B. E. Woodcock (Leeds 17)	New	411
R. G. Williams (Borehamwood)	449	449
A. Hall (Lockington)	281	406
S. Hill (Port Talbot)	New	320
L. Griffiths (Sheffield 6)	315	315
S. Burgess (Stockport)	New	301
M. Probert (Basingstoke)	260	260
P. McAllen (Southampton)	New	224

200 Prefixes to have been heard for an entry to be made in accordance with HPX Rules. At score 500, transfer to the All-Time list is automatic. Note, the Annual Table is a Phone only listing.

### Most in 1987

E. M. Gauci (Malta)	740	820
---------------------	-----	-----

Rules as for the Annual Listing. An entry for this listing must be in addition to any claim for the All Time Post War listing.

connectors such as the PL259 type. Before putting it up, measure the s.w.r. of the coaxial cable with the far end open-circuit and note the reading. When you do maintenance a check of the cable's s.w.r. under the same conditions should give the same answer — if it shows a lower s.w.r. than 10:1 then the cable has become lossy and needs dumping.

Sealing the end of a piece of coaxial cable successfully where it joins the antenna elements is quite

difficult; but it is vital. Since the PL259 isn't waterproof of itself, that also needs to be sealed. The rubber-based sealants which give off a smell of acetic acid as they cure should be treated with caution, as the acid is corrosive — but there is a variety on the market which doesn't use acetic acid. Some people swear by the rubber self-amalgamating type. When you are putting it all back up, it is worth considering whether to put up "preventer" guys as an extra precaution should the normal guy

### HPX RULES

1: The object is to hear and log as many prefixes as possible; a prefix can only count once for any list, whatever band it is heard on.

2: Only calls issued for amateur radio operation may be included. Undercover and pirate callsigns will not be credited, nor any MARS stations be claimed.

3: Where a suffix determines a location the suffix shall be the deciding factor, thus W1ZZZ/W4 counts as W4. Where the suffix has no number attached, e.g. VE1AED/P/SU, VE3UJ/P/SU, they are arbitrarily counted as SU1 and SU2 respectively, and the same holds good for similar callsigns.

4: The object is to hear prefixes not countries, thus there is no discrimination between say MP4B and MP4K which count as one prefix.

5: The /P, /M and /MM suffixes create a new series; thus G3SWM, G3SWM/P, G3SWM/M and G3SWM/MM all count as prefixes, and where it is known to be legal, /AM also.

6: When the prefix is changed, both the old and the new may be counted; thus VQ4 and 5Z4 both count.

7: G2, G3, G4, etc., all count separately, as do GW2, GW3, etc., and in the same way K2, W2, WA2 all count separately even though they may be in the same street.

8: Send your HPX list, in alphabetical and numerical order showing the total claimed score.

With subsequent lists, it is sufficient to quote the last claimed score, the new list of prefixes, and the new total. Give your name and address on each sheet, and send to: LADDERS, Short Wave Magazine, Enefco House, The Quay, Poole, Dorset BH15 1PP. If possible to arrive before the deadline for that particular month.

9: Failure to report for two consecutive listings, i.e. four months, will result in deletion from the Table, although there is no objection to a "nil" report to hold your place.

10: 200 prefixes must be heard to gain entry onto the yearly table, and at 500 prefixes entry to the "all time" table is automatic. There is a c.w. only table, a phone only table and an AMTOR/RTTY table.

11: The prefix list is based on those shown in the current *Radio Amateur Prefix-Country-Zone List* published by Geoff Watts, 62 Belmore Road, Norwich NR7 OPU.

break — especially if there is any risk at all of the mast falling out of the garden onto a road or pathway. I have used an extra set which are never in tension unless the main guy breaks, for just this reason.

Finally, don't forget that most of the synthetics deteriorate badly

under ultra-violet light, so routine changing of terylene guys and halfyards is always a good idea — you can always use such “retired” stuff for less important work! And it goes without saying that the stretch in nylon rope makes it totally unuseable for guying; so ask what synthetic the rope is made from when you buy it!

## New Chums

Our first one is **S. Hill** (Port Talbot); he has a TRS-80 doing the log-keeping and similar work, plus a Howes direct-conversion receiver for 14MHz, and a scanner receiver for the 70, 144, 432MHz bands. Antennas are a discone for the scanner, plus three dipoles, one E-W, one N-S, and one inverted-V. He thinks that possibly other readers are “put off” by the need to keep a log, and he encloses a program which provides a Prefix List sort of the loggings. Turning to the signals of interest, during September the mid-afternoon activity of VK2EQ, twice blasting in to Port Talbot, and also that of SV2UA/SY, Mount Athos who appeared in the GW3CDP net.

Now to Southampton, where **P. McAllen** runs an FRG-7700 with an FRT-7700 a.t.u., into a vertical tribander by Jaybeam. In fact Peter seems to stick to 14MHz phone, and his listing covers all continents nicely.

**S. Burgess** (Stockport) has an end-fed wire half in the loft, half outside, fed to a home-brew a.t.u. and FRG-7700 receiver. Simon used to have a Drake R4C, and sadly misses the notch filter. Of course, to compare the two receivers is a bit unfair anyway, as the old Drake was made for a much more demanding application and its new price reflected that. Another possible approach would be to use a Datong audio filter unit.

**B. E. Woodcock** (Leeds) has sent in a first list; Basil has been at it a while now, with some 292 countries confirmed and nowadays he specialises in IOTA (Islands on the Air) in which he has 237 islands confirmed. Basil agrees with the comments recently by D. Hughes, that the standards of operating have deteriorated sadly in the last few years.

**P. J. Barnes** (Blackpool) uses a Trio 9R59D, and has 393 prefixes for his first entry in the c.w. section.

## Others

**E. W. Robinson** (Felixstowe) latched on to the Mount Athos group, and both 5L1H and 5L1AH/Portable 8, so the latter becomes a real rarity in HPX terms as 5L8.

**R. G. Williams** (Borehamwood) says he has, “made up my mind to like the new style *Short Wave Magazine*”. However, like us or no, he likes HPX and continues to

rise in the Ladder. Perhaps his Pet of the Month is TR8CW, with W87PAX as runner-up.

Next, **N. Melville** (London N) who was a bit puzzled by a Russian and an Italian. UZ4WHK/UH1B was something of a “special” from UH (Turkoman), while IL3/IK3CAZ was operating from IL — one of the assortment of offshore islands around Italy. The “reversed” form of callsign (IL3/IK3CAZ rather than IK3CAZ/IL3) is a new standard which is being adopted throughout the Common Market countries, and has a lot to commend it — with the old method you could turn up your nose, say, at a W1, and tune off him too quickly to realise he was in fact /7 in Colorado, whereas if the start of the call is the prefix for the place where he is actually located you would stay for a serious listen; so I hope this new system becomes universal.

What hopes of a 28MHz beacon list enquires **M. Ribton** (Gillingham, Kent), he being full of enthusiasm since he now has a fully-equipped shack half-way down the garden... wonder how the enthusiasm will hold up in February? Seriously, in answer to the first question, I haven't seen one lately, but doubtless there will be one soon; meantime, just tune around the beacon segment carefully each day, and since all beacons have callsigns, you will still know just where the band is opening too!

Now to an interesting letter from **N. Hembrey** (Northiam). Back in August, Norman was thinking about a change of receiver; now he has changed to the idea of an update to the antenna farm. There are, a TA31JR trap dipole, an 8-over-8 slot-fed Yagi for 144MHz all on a 10m Telomast, and a 48-element multibeam on the chimney for 432MHz. Feeders for the first two are fed by TV type coaxial, fed underground into the shack, and after ten years they could be, as Norman says “Pretty Awful?” The revision involves swapping the 8-over-8 with a ten-element Parabeam, and putting the multibeam also on to the Telomast. Then, each would be fed to a shed about 1/3 of the way along, into a coaxial switch, and then a single UR67 coaxial from there fed to the receivers. It all sounds like a good idea, although one would need to switch again back at the shack unless one is prepared to switch plugs around continually and accept the extra breakage rate, and it assumes the coaxial switch in the shed is switchable from the shack. On the other hand, there is always the

question of how far the old coaxial cable has really deteriorated. As far as the sheath is concerned, if the cable has lived in an underground duct for ten years it has been preserved from UV radiation, and if its sheath wasn't damaged by abrasion, and water hasn't got into the antenna end, then that coaxial may be as good as new! On the other hand, just buried, and left in the soil for worms, moles and other things to chew at, and it may be very sick indeed. The only safe answer is an s.w.r. check as already suggested. Ideally the s.w.r. without the antenna connected ought to be infinity, and practically MUST look higher than 10:1. Paradox: if the feeder deteriorates, it “improves” the s.w.r. Thus a very bad length might show an s.w.r. of 3:1 on this test.

**A. P. Lincoln** (Aldershot) is still using the Tono 550 and Wrasse SC-140 units as his prime interest is SSTV and RTTY, and of course he still collects computers. Pete says he likes particularly the review articles in *PW* and *SWM*.

## Prefixes

**D. Jones** (Liverpool L4) is a new reporter who has a Sony ICF600DS, with which he is very much feeling his way. First, David, the question of prefixes. The best way to get to know “which is which” is to get hold of a copy of Geoff Watts' Prefix List. Geoff Watts is at 62 Belmore Road, Norwich NR7 0PU, where he does various useful listings — for instance, a listing of the UAs by their oblasts in case this sort of thing is of interest for collecting the various awards put out from Box 88 Moscow, or to know where on the map your man is. As for USA, the number in the callsign represents the call area in which the station was first licensed; in rough, we could say W1, W2, W3, W4 are on the eastern side, nearest us, W6 is California, W7 and W0 cover the other parts of the West, while W5, W9 and W8 cover the more easterly inland areas, but to hear a W6 say he is in, for instance, Maine, is not unknown these days! Don't forget also that when we say W we could mean W, A, K, N, prefixes, and two-letter variations on them; while to complicate things further, two letter prefixes can also cover US territories.

**W. J. Prior** (Lochcarron) now has some 900-plus callsigns in his log on RTTY, so new ones are getting a little harder. Since the Lochcarron winds are QUITE determined that none of Bill's

antenna erections will survive for long, he is in any case handicapped, not to mention having a considerable problem from the surrounding terrain anyway as a glance at the map will show. Thus Bill was more than a little chuffed to read 8R1RPN solidly.

**D. A. Whitaker** (Harrogate) asks us to remind everyone about the White Rose ARS SWL Contest in January. For himself, David has been very pleased to find seven new countries, and on the other side, he now has an R820 receiver to replace the old JR310 he has used for the past 15 years. The extra filtering is perhaps the main advantage, plus the 20dB attenuator. One has to say that generally, the attenuator is rarely if ever unused on the lower bands, paradoxical though it may seem — simply because of the overload created by the big signals out of band that hit the input terminals.

**C. R. Eve** (Jersey), **Brendan McCartney G4DYO** and others have noted I slipped up over the TV7GLC. In fact it was in Rouen, celebrating 900 years since the death of William the Conqueror, and run by the Radio Club de Normandie, with QSLs via F6DLM, whose address is OK in any Call Book since 1975. That gives me the chance to mention that a sub to DX News Sheet, which G4DYO edits, each week is well worth while if you want to be alerted to all that is happening in the DX World, Write to RSGB HQ, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE for the details. On a different tack, Chris says that on the lower bands, he uses a loop antenna, as described in the May 1987 issue, and an audio notch filter to combat QRM. To that I would add that if you haven't got a loop, the attenuator is a help, as is discreet use of i.f. shift, variable audio bandwidth, and a tone control if available. If the “monkey-chatter” is mainly high-pitched, the latter can be spectacular — but DO remember to put everything back to normal when you switch off, or you may surprise yourself next time round!

What a difference a year makes, says **B. Patchett** (Sheffield). Brian is referring to the way in which conditions have picked up since we passed the sunspot minimum last September; not so much noticeable as on 21MHz, and to some degree on 28MHz too. Last October on 28MHz there was nothing but the odd European opening, this time, from work TJ1CH, KN9RN/M, K3PAQ, 9Q5DA, FR5DX, and from the mobile VU2NTA, ZS6UN, W2EZD, N9QX, W2RP, W2BAI, and UA9YX. Other signals accounted for included ZL4BO and, on 3.5MHz, OX3SG, W9RE, and K3WW. All of this of course reflects in the HPX Ladder up 55 on a previous 1206.

**Remember — post your reports early for Christmas — to arrive by December 11**

## DECODE

Mike Richards G4WNC

200 Christchurch Road, Ringwood, Hants BH24 3AS

How many of you spotted my deliberate mistake in the October Decode? **Brendan McCartney G4DYO** did, but then I suppose he should have as he's the editor of the *RSGB DX News Sheet!* What was this error you ask, well, I claimed that the amateur prefix **XX9** was Portugal when in reality it's Macao which is way out in the Far East near Hong Kong. My apologies for misleading you all, at least it proves I'm human (!). If you would like to try and catch me out I suggest you arm yourself with the Radio Amateur Prefix / Country / Zone List which is available from **Geoff Watts<sup>(1)</sup>** price £1.00. my thanks to **Brendan** for pointing out the error.

### RTTY

Some interesting reports received this month, but first a request from a few readers. Several people have asked for frequencies of weather stations that broadcast plain language reports. I expect most of you have already discovered the large number of stations transmitting 5-digit groups but the plain language stations are a little more elusive. One of the problems with the plain language stations is that they seem to send just test slips or steady carrier for quite long periods. How about writing to me with details of any stations that you have discovered. I'll publish the details in my name or anonymously if you would prefer!

Here is an extract from a RTTY log that was received recently:

- 14.777MHz RTTY 50 baud rev.
- 14.630MHz RTTY 50 baud rev. Cairo Aero.
- 6.795MHz RTTY 50 baud rev. Sophia Meteo.
- 13.526MHz RTTY 50 baud normal Gregel Met.
- 18.165MHz RTTY 50 baud rev. Khartoum Aero.
- 7.800MHz RTTY 50 baud rev. Iran.
- 14.638MHz RTTY 75 baud normal US Info.
- 10.298MHz RTTY 50 baud normal USSR.

The amateur bands have been very active this month with one or two very unusual calls about. On the 9th of October I logged **OF1WF** (Finland) working **ZL1AHA** (New Zealand) on 14MHz RTTY. The OF prefix is a little unusual and further listening revealed that the stations usual call is **OH1WF**, the special call being to celebrate Finland's 70th anniversary of Independence. It must be the season for Independence celebrations as **5N27ZNH** (Nigeria) was also logged in October the reason for the 27 in the call is that the Nigerian Independence Day is actually the 27th September.

The following list shows my best DX during this period: **JR3TMW** (Japan), **4K1PLK** (Antarctica), **9Q5BG** (Zaire),

**PY6SL** (Brazil), **LU2ALH** (Argentina), **CX9CA** (Uruguay), **D44BC** (Cape Verde), **YB5NQG** (Indonesia). One final unusual station was **YO4AVR/MM** (Romania) who I heard on 14MHz RTTY whilst he was maritime mobile off the south-east coast of Brazil.

**AMTOR** activity has also been quite good, I still find the poor use of callsigns rather frustrating, as you often have to monitor a QSO for a considerable time before the stations can be identified. If you want to receive **AMTOR** then the best frequencies to monitor are 3.59MHz, 7.035MHz and 14.075MHz all these are all  $\pm 5$ kHz.

Packet radio is still continuing to expand and monitoring around the centre of h.f. activity on 14.103MHz will very quickly reveal an amazing range of callsigns. The latest addition to my log is **6W1FJ** in Senegal, West Africa. The operators name is **Malick** and his QTH is **Dakar**. This station seems to be very active at the moment so it should be easy to find.

### Prestel

A response from **Prestel!** My offer of a fast response help clinic using my **Prestel** mailbox has been taken up by **G. Marazzi** who was the first to contact me and required advice on the development of his shack. I'm glad to say I was able to respond very quickly and all seemed to work very well. If any readers would like to take advantage of this service, my Mailbox number is: 425470071.

### FAX-1 RTTY

Regular readers who saw my review of the ICS Electronics **FAX-1** in the October *SWM* will no doubt remember that I mentioned the facility to receive **RTTY**. This option enables the **FAX-1** to decode and print out standard wide shift **RTTY** signals and is a useful addition. The software reviewed with the **FAX-1** was a development version which has now been enhanced and is included as standard with all new **FAX-1s**. I suggest you read the October review for the main details but I will mention the enhancements here.

The first improvement is that inverted **RTTY** can now be received without having to either alter switches on the rear of the **FAX-1** or change sideband. This is achieved by a simple press of the **IOC** button which, when in **RTTY** mode, acts as a toggle between inverted and normal **RTTY**. The second enhancement concerns the actual printing of the received **RTTY**. In the original software, printing only occurred when a complete line with carriage return and line feed had been received. With the new software the contents of the print buffer can be printed at any time by pressing the **PHASE** buttons. This facility is particularly useful for quickly checking that you have selected the correct parameters for decoding a signal.

For those of you who already own a **FAX-1**, an upgrade package is available by sending your existing **EPROM** to **ICS Elec-**

**tronics<sup>(2)</sup>** price £33 plus £1 P&P. One very important point concerns static protection. It is vital to use proper electro-static protection when removing or replacing the **EPROM**. If you are unsure about this I would recommend that you contact **ICS** first. The upgrade will apparently include a revised and expanded manual with all the original errors corrected.

### FAX

Lots of **FAX** this month starting with some v.h.f. activity. **Paul Yearsley G1UTM** and **Chris Vernal G4VCH** have both written to me with details of their v.h.f. **FAX** activity. The frequency most used by both **Chris** and **Paul** is 144.7MHz which is the designated **FAX** calling frequency, though you may find activity on an adjacent frequency. The standards commonly used are 120 r.p.m. and an **IOC** of 288. I have made a suggestion in my **RTTY** column in *Practical Wireless* that the first Monday in each month should be a **FAX** activity night. I am hoping that this will increase the amount of **FAX** activity and help to bring together a few people with common interests. I noticed recently that in the **DARC** (German Amateur Radio Club) **FAX** Contest, 14.232MHz was suggested as a **FAX** frequency as well as the normal 14.101MHz. This is significant as the 14.101MHz allocation suffers severe interference from amateur packet stations, so perhaps the **FAX** groups are going to declare a new frequency to get away from the packet frequencies!

Here is a selection of stations from the **FAX** log for this month:

- 3.555MHz 120/576 DDH3
- 4.053MHz 120/576 NGR
- 13.512MHz 120/576 CFH
- Halifax, Canada
- 8.083MHz 120/576 ROM5
- Tashkent
- 18.235MHz 120/576 BAF33
- Beijing
- 10.712MHz 90/576 RKA73
- Moscow

The figures after the frequency in the above list are speed in r.p.m./**IOC** (Index Of Co-operation).

**Esmond Aguilar F6GOV/G4KBJ** has written from France with details of his **FAX** station. **Esmond** uses the popular **FAX-1** decoder which drives a **Brother 1409** printer. The receiver used is the **Trio TS-940S** amateur radio transceiver which, judging by the pictures sent is performing very well. **Esmond** does ask the question, as do many of you, "What happens if I accidentally receive a Press photo?" The **Amateur Radio** licence contains a section covering the reception of signals that you are not authorised to receive. This basically states that the contents of any message



This is one of the pictures from **Computercations** — note the noisy picture.

# SEEN & HEARD

so received must not be divulged. This section has to be included in the amateur licence because when using bands that are shared with other services you are bound to occasionally receive a non-amateur signal. For the unlicensed listener things can be a little more complicated, as the Wireless Telegraphy Act simply states that you can only receive signals if you are authorised to do so. Consequently if you are not authorised to receive any FAX signals then you shouldn't be looking at all! This is perhaps a rather gloomy view of things, in practice if you are either a licensed amateur or licensed to receive weather stations then you should be covered for the accidental

reception of other FAX signals. The important point is that you are not allowed to pass the pictures to a third party. The reasons for the restrictions are fairly obvious and fall into two main categories. The first is national security. Military and other Government services need to use radio communication and the message content, in a lot of cases, is sensitive and needs legal protection. The second category is commercial transmissions, an example being

the Press Agencies. These Agencies gather news in various parts of the World and use radio to broadcast the news stories and pictures. Obviously, in this day and age, this service is not free and the Media pay the Press Agency for the information that they use. The Wireless Telegraphy Act in this case is protecting a commercial interest.

I think the most important asset for the short wave listener is common sense. If you intercept

private, confidential, or Military traffic then you are asking for trouble. If you then make this information public then you can expect a knock on the door!!

The views I have expressed here are only my own interpretation of the situation and your comments would be very welcome.

I am just off to the Computercations Exhibition in Brixham where I hope to run a live FAX demo on the PWW/SWM stand. Next month I will, if all goes well, publish some of the pictures.

(1) Geoff Watts, 62 Belmore Road, Norwich, Norfolk, NR7 0PU.

(2) ICS Electronics Ltd., P.O. Box 2, Arundel, West Sussex, BN18 0NX.

**Be mindful of the  
Christmast post, your reports  
must arrive by December 14**

Following our information last month on tracking and listening to the operations from the Soviet MIR space station, more details have come in on future space plans in the USSR, as a result of the October 2 to 4 Space Symposium held in Moscow, in celebration of thirty years of spaceflight. This was attended by 850 space scientists, and included shuttle operator Owen Garriott W5LFL and President Vern Riportella WA2LQQ, both representing AMSAT, with Leonid Labutin UA3CR, for the USSR AMSAT group. Since the September 1984 meeting when your author went to Moscow to discuss AMSAT phasing, some excellent further progress was made in the recent meetings toward using the advanced Soviet launch technology for future AMSAT satellites and payloads. In particular, plans are being further advanced for "MIR" to carry the "PACKSAT" and "VITA" packet radio transponders that were earlier due to fly on the aborted shuttle mission with Ron Parise WA4SIR.

MIR-2 is planned for 1992, a 100 metric tonne spaceship to be taken onto orbit by the massive new re-usable *Energia* launch vehicle which is said to be able to lift off 200 metric tonnes to low earth orbit. With the six planned launches per year, numerous modules will be taken and attached to the MIR docking ports, each having their own mass of some 20 metric tonnes. Each is as large in dimensions as the current MIR station. The eventual complete assembly will result in a very large and visible major space station in permanent earth orbit, probably to be used as a launch base for interplanetary and deep space missions. The USSR "shuttle", a fly-back re-usable space transport system is now in development, and has already undergone atmospheric take-off and landing flight tests by pilot Igor Volk, who flew in the 1984 SOYUZ T-14 mission. The first

space tests are planned for 1989, to complement the current automatic docking *Progress* supply and *Soyuz* man-ferry vehicles.

Several readers have enquired whether a repetition of the May and June 1986 cosmonaut hopping between MIR and Salyut-7 will come about again this year, and **John Branegan GM4IHJ**, who recently gave a lecture on this topic at the Soviet Astronautics Symposium at the British has provided the answers.

"It is most unlikely" states John, "as first, Salyut is orbiting at 480km altitude. Unassisted Soyuz ferry flights, even if stripped of two men and no extras could not safely make it to 480km without a *Cosmos 1986* or *Progress* type space tug, as there would be no safe fuel margin". "Secondly," says John, "the current 480km Salyut-7 orbit, where it was 'parked' following the last cosmonauts' visit in 1986, is far less perturbed than that of MIR. Whilst the two stations were in the same orbital track in 1986 playing 'follow my leader', they now intersect at nearly 90 degrees to one another. To manoeuvre from one to the other in this configuration would be very expensive on fuel".

John recommends that enthusiasts who would wish to follow this problem further should read *Fundamentals of Astrodynamics* by Bate, Muller and White, published by Dover in the USA and Constable in the UK, but warns that to follow they should have mathematics at least at "A" level! A comprehensive treatise by GM4IHJ on following MIR is to be found in the October *Journal of the British Interplanetary Society*, which describes the complex matter in terms that are easy to

follow by the non-expert.

It would appear that even without the inter-spaceship hopping, we are to see an increasing number of space events over the next few years, and regular observation of the frequencies supplied last month could be highly productive and informative to listeners.

Latest reports from keen space listener **Berger Lindholm** of Finland indicate that a new module called *Inertia* is now attached (or immediately adjacent) to MIR. A data transmission co-incident with computer calculated MIR passes (the same tracks as for *Inertia*) can now be heard on 166.140MHz, in addition to the 143.625MHz f.m. voice frequency we have been following.

## Elint

In addition to MIR, **John Branegan** follows many other satellites, and draws our attention to the Elint, Store and Dump family of satellites that are to be found with simultaneous transmissions on 153.420 and 204.560MHz (Elint), 153.480 and 204.640 (Elint) and 153.600 and 204.800MHz (Store & Dump). Faint signals are also to be heard on 153.300MHz, and at other times on 204.440MHz. The entire matrix could be from 153.300 to 158.600MHz, and from 204.400 to 204.800MHz, i.e. every 60 to 80kHz across the band. A study of the downlink format shows that the pair of frequencies are linked, each being the third and fourth harmonics of a 51 MHz fundamental, e.g. 153.420MHz and 204.560MHz are respectively the 3rd and 4th harmonic of 51.140MHz.

As these satellites gather

information, store it in memory and then dump it to ground link upon earth command to a specific point, John naturally early on assumed that this was a clever encryption technique, whereby both phase locked signals must be simultaneously demodulated in order to extract the total intelligence transmitted. Consultation with professionals suggest that this is not the case, but that the choice is a clever way to overcome the severe problems on complex signals that can be brought about by Faraday rotation and scintillation. The trick is that being phase-locked, one may cross-correlate (multiply) the pair of signals such that one obtains a minimum of 6dB signal to noise enhancement, plus the advantages of frequency diversity.

It is otherwise difficult at v.h.f. to avoid the loss of signal gathering problems caused by scintillation, plus the changing rotation of polarisation brought about by the passage of the downlinked signal through ionised layers in earths magnetic field. They are particularly noticeable with high Doppler shift and low elevation angles evidenced in low circular orbit satellites, when the angle of incidence to the ionised areas is low, a maximum slant range signal passage through the ionosphere is present.

All western traffic has shifted to microwave frequencies to help avoid these problems, but an even higher Doppler shift results at s.h.f. and an even poorer performance at low elevation angles due to high path losses. What is more, the cost of microwaves is some five to ten times greater, both at the satellite and at the ground station. It would appear that a cute answer has been found, both in technical and economic terms, and that v.h.f. satellites will be with us for some long time yet.

## Weathersats

**Howard Barnes** of Wivenhoe, Colchester, writes in to say that he

## INFO IN ORBIT

Pat Gowen G3IOR

17 Heath Crescent, Hellesdon, Norwich, Norfolk NR6 6XD

# SEEN & HEARD

faithfully followed our series of articles on the weather satellites, and really appreciated the help in getting started. He has now completed his Cirkit version, having successfully aligned it with no more than a home-made m.o.s.f.e.t. voltmeter and (quote) "... a certain amount of intuition ..."! The alignment of the r.f. stages was easily completed after this. He tried four different antennas before building the version given in *Practical Wireless* on page 46 in the November 1985 issue, which alone resulted in total success, and found the recommended pre-amp to be essential also.

Howard says, "It cost me only about £50 to £60 to start, so I would recommend anyone interested not to be put off by either the apparent expense or the complexity of the project". Howard wonders if any readers can provide for general publication further hints and kinks based on their own experience. For instance, the Cirkit receiver has an "uncommitted" squelch output, and he wonders how best to put this to use to provide a means of both muting the audio and to automatically switch on a recorder.

**Birger Lindholm** of Dalsbruck, Finland, tells us that the following USSR weather-satellites are currently active:

Meteor 1/3 is on 137.010MHz  
Meteor 2/14 is on 137.850MHz  
Meteor 2/15 is on 137.850MHz  
Meteor 2/16 is on 137.400MHz  
(Meteor 2/16 is the latest in the series, being object no. 1987-68A, launched on 18 August 1987).

Meteor's 2/8, 2/9, 2/10, 2/11, 2/12 and 2/13 have not now been heard for some long time, and therefore we must now assume that they are no longer in use. Cosmos-1602 is seldom in use, whilst Cosmos-1766 is on from time to time, being occasionally switched into activity by ground control. NOAA-9 is still going strong on 137.620MHz, as is NOAA-10 on

Literally anyone can be a Band II DXer. After all, now that the BBC and IBA cover the UK with their national and local networks, there are plenty of interesting stations to look for. When tropospheric conditions are right, a multitude of continental stations can also be heard.

This need not be an expensive business because most people have a portable of average sensitivity, which includes the v.h.f. broadcast band (88-108MHz). It is amazing what can be received with the set's own telescopic antenna. Obviously, receivers vary and the dedicated enthusiasts go looking for DX with



Fig. 1

137.500MHz. NOAA-11 is due for launch on October 29, and should be with us by the time you read this column.

## Tracking

Several readers have asked if we can publish equator crossings for the main satellites of interest, so as to be able to update their calculators and computer tracking programs. May we draw attention to *Practical Wireless*, which contains in the column devoted to space and satellites a regular two monthly uplisting of the latest available Keplerian elements for all the RS spacecraft, the OSCAR series, the NOAA and Meteor weather satellites, the manned orbiters, and all other satellites of interest. Every month, reference equator crossings, periods and increments are given for all of the main amateur and weather satellites on a fortnightly basis. We have a little more space (sic) available in *PW* than here!

## Simple Sat-pix

**Graham Smith G1JVZ**, sends in an infra-red METEOSAT-2 picture (Fig. 1) taken on August 11 that

he succeeded in producing on his ZX printer by a rather unusual route. He asked G1OZH to receive a Meteosat picture on his "S" Band equipment, which he then stored and displayed on a Wrasse SC-1 SSTV/FAX frame store and scan converter. This was then transmitted to a tape recorder in SSTV standard format, from whence there was no problem whatsoever in getting it on the Spectrum screen, adjusting the contrast and brightness for the best resultant image. In this way, the problem of synchronising the picture signal using a tape recorder and computer can be overcome.

256 x 256 pixel high resolution graphics are possible, but as the program has numbers along the border (trimmed off so as not to detract) one does not get the 256 pixel full width. Graham recognises that a full page printer with white paper would further improve the result, yet Spain and North Africa can clearly be seen on the standard small metallised paper used for the simple printer. Graham points out that in this way, using standard SSTV form, a picture could be sent over the air or down a telephone line without any synchronisation problems.

**Make sure your reports arrive by December 14**

## BAND II DX

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

expensive receivers coupled to outside rotatable beams. On the other hand the portable user soon recognises the stations that can be heard at the home QTH when conditions are normal and is quite happy to wait for a change in the troposphere to provide those additional signals.

## Tropospheric Openings

It is well known that the paths of v.h.f. signals are easier, and their ranges increased when the weather is fine and the atmospheric pressure is high. A more intense opening, which can further increase the range, often

**Brian Coupe G4RHZ**, writes to tell us that Cosmos-1871, a military recon-sat, which was launched on 1 August 1987, fell back to earth on August 10, this possibly indicating a motor failure. Brian quotes a report by Geoff Perry, who stated that his observations of Cosmos-1870 (Object 1987-64A) indicated a payload of 15-20 metric tonnes, with a visual magnitude of -1. He found transmissions on frequencies earlier used by the Meteor and Intercosmos series, using a modulation system like Kwant and the heavy Cosmos modules, although the frequencies were not supplied.

**Harry Johnsen LA4XC** tells us that now three modules are docked to MIR, these being called *Kvant*, *Progress* and *Inertia*, so it would be logical to assume that *Inertia*, the latest, is one and the same as Cosmos-1870. Quite separate Keplerian element sets are given for the set of three in the NASA listings, but when calculated out to passes, they all come to the same positions.

**Gordon Anderson SM4MOT** gave an interesting account of his observation of the Intelsat-5 satellite on the day of the massive hurricane force winds here in the UK, when such a deep low came across England bringing such unprecedented destruction of homes and trees. He found that whilst most signals were stable, as normal, transmissions emanating from the UK were subject to deep QSB. At first, this was thought to be due to movement of the microwave dishes due to the wind, altering the focus of the uplink. Such effect would have produced irregular and variable strengths, but Gordon's finding was that the signal was varying by a regular amount from minimum to maximum on a very regular half second fade rate. We have to conclude that the effect was propagational, due to sheer forces in the weather system producing gravity waves bringing about slanting of the signal path.

occurs and lasts for several hours while the prevailing high pressure is falling. A simple barometer is a good instrument to have near your set and when its pointer has risen above 30.0in (1015mb) the time has come to keep watch on Band II for broadcast signals from afar.

Daily weather maps, on television or in some national newspapers, can also be useful DX predictors because they show the movements of high and low pressure systems over large areas. These observations, coupled to v.h.f. DXing, often encourage an interest in the fascinating subject of meteorology. I was reminded of

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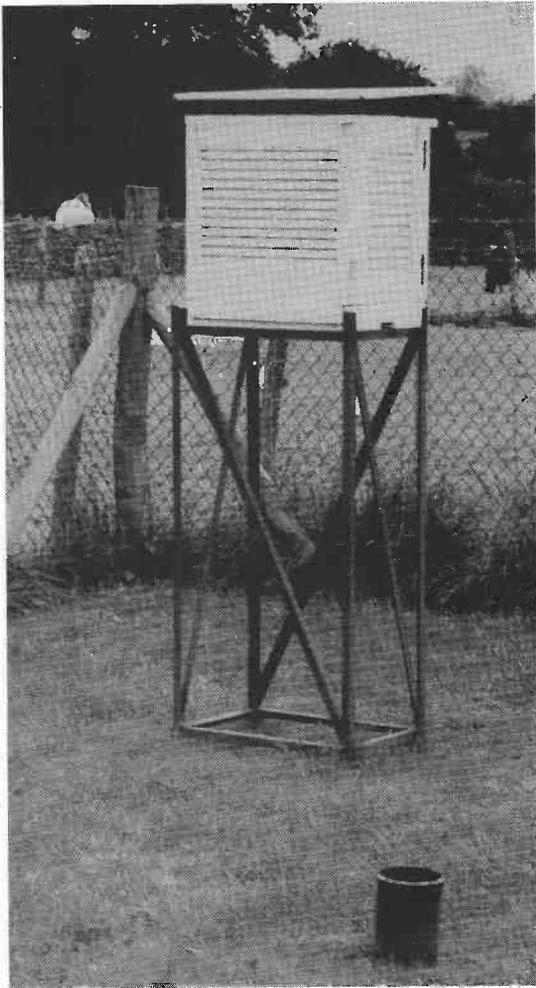
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◀ Fig. 1

this when I saw a typical weather station installed in the farming section of the Roman Palace at Fishborne, Sussex, Fig. 1.

## Hurricane

At midday on October 14, the already low pressure (29.6in) started to fall, by 1800 it was

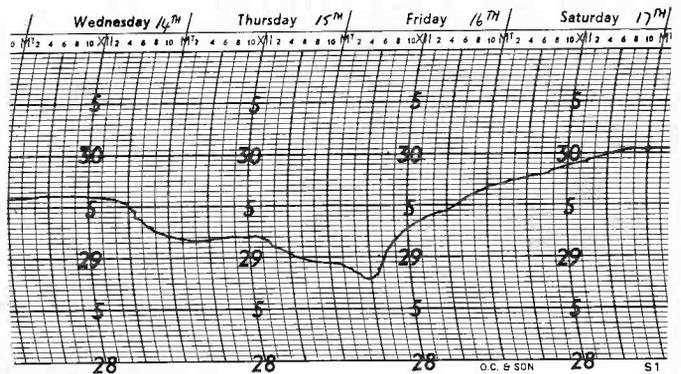


Fig. 2 ▶

29.5in and at midnight it stood at 29.2in. Around midday on the 15th, another fall began which reached 29.0in by 1800. The indicator on my Short and Mason Barograph was below 29.0in at midnight and by 0500 on the 16th it was reading 28.8in. Between 0100 and 0500, a hurricane crossed southern England causing considerable damage, and immediately after the pressure began to rise rapidly, Fig. 2, reaching 29.3in by noon and 29.7 at midnight.

I know that strange things also happen to v.h.f. radio signals under such extraordinary conditions, however, I could not check the bands on this occasion because, the electricity went off about 0200, my radio room window was blown in around 0245 and by 0500, the home QTH was damaged and the garden was a shambles with fallen trees. On the 21st I was still without electricity and little prospect of getting any because many poles and wires are down in the locality.

## Reports

At his QTH in London, **Phil Townsend** uses a Blaupunkt-Turin car radio, with the choice of north-south and east-west wire antennas, and an Armstrong 624 fed by a 2-element, south-facing, beam for DXing in Band II. Phil logged French language stations between 88-89MHz during the early evenings of September 12, 13, 18 and 28, around 99MHz on the 11th and 27th and at both ends of the Band at 1515 on the 8th. He heard idents for France Musique on the 18th and 28th and has logged signals from BBC Radios Bedfordshire, Cambridge, Essex, Kent, London and Sussex and the IBA stations Capital Radio, Chiltern Radio, Invicta Radio, LBC and Radio Mercury.

Although **Bill Kelly** (Belfast) had little to report this time, he did hear adverts from Westside Radio, Ayr at 0755 on September 19 and announcements and the local news from Radio Clyde at 0301 on October 2.

"I am very interested in DXTV," said **Bob Brooks** (Great Sutton). He identified signals from 15 countries, in Band I, during various Sporadic-E events between July 17 and September 6. Bob's station is equipped with a D100 converter, Telefunken 2920 video recorder, JVC CX610 receiver and a combined Band I/III antenna with a Labgear CM7065 pre-amplifier.

His log for the period includes idents, programmes and test cards from stations in Austria (ORF-FS1), Czechoslovakia (CST-Bratislava and RS-KH), Germany (ARD-1 WDR), Holland (PTT-NED1), Hungary (MTV-Budapest), Italy (RAI, TGI and Televideo), Norway, (Bagn, Gamlem, Gulen, Hemnes, Melhus, Steigen and Televerket), Poland (TVP and Warsaw), Portugal (RTP), Romania (TVR Bucaresti and Televista Romania), Spain (TVE, Teledario and Valencia), Sweden (TVI-Sverige), Switzerland (+PTT-SRG1), USSR (HOBOCTN) and Yugoslavia (RTV-1 Ljubljana).

## TELEVISION

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

Bob also sent 3 interesting pictures which he received from Italy (Fig. 1), Poland (Fig. 2) and Portugal (Fig. 3), during the summers of 1983, 4 and 5 respectively.

**Howard Barnett** (Northampton) recently installed a Salora 15L33 multi-standard receiver to start TVDXing and he tells me that the v.h.f. section of this set covers Channels E2-12 and F2-10.

## Band I

From his QTH in India, Lt. **Col. Rana Roy** noted Sporadic-E disturbances before 0800 on July 17, 19 and 25 and during the evenings on days 16, 24, 26 and 28. Although Rana identified a Chinese news reader for a few minutes at 1805 on the 16th, the signals he logged came mainly

from various parts of the USSR.

"At 0620 on the 17th, we saw a Russian test card on Ch. 3 and by 0625 there were 3 Russian stations fighting for predominance on the screen," said Rana. He added, "The pictures were not very clear due to overlapping, however, at 0725 we saw a fairly clear picture of a news-caster (Fig. 4), but by 0730 there were multiple images again and it was impossible to identify any signals". He also found a mixture of Russian pictures on the 16th, 26th and 28th. A Soviet news programme, received by Rana at 0920 on June 28, on Ch. 2, suffering from co-channel interference is shown in Fig. 5.

Although the recognised Sporadic-E season usually ends early in September, it is still worth

checking the band frequently for random short-life openings. For instance, Bob Brooks, logged news from Italy, test cards from Poland, the USSR and a new test card with Kanal-1 at the top from Sweden during the morning of the 10th, Czechoslovakia at 1047 on the 14th and programmes from Italy and Poland between 1222 and 1617 on the 15th.

"There was some Sporadic-E on the 17th," wrote TV columnist **Garry Smith** (Derby) after switching on at lunchtime and finding RAI (Italy) on Ch. 1b and a weak test pattern on Ch. 1a. "The best DX came shortly after 1800 when I logged TVE (Spain) on Chs. E2 and E4 and an Arab station on Ch. E3," said Garry.

Among the signals logged by **Noel Smythe** (Caerphilly) toward the end of the season was a clock from Austria (Fig. 6), the PRAHA logo (Fig. 7) from Czechoslovakia and a news-reader (Fig. 8) from Yugoslavia.

Garry Smith's camera is usually ready when DX is about and, late in the season, he caught the

# SEEN & HEARD



Fig. 1: Rome

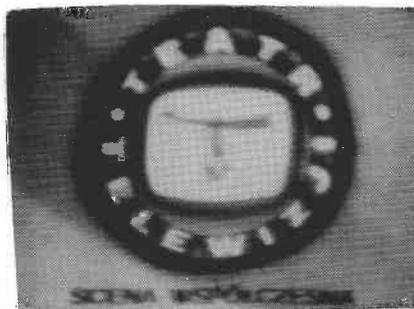


Fig. 2: Poland



Fig. 3: Portugal



Fig. 4: USSR

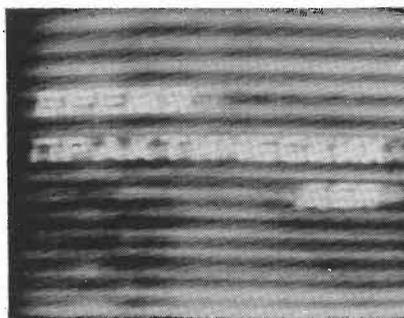


Fig. 5: Interference

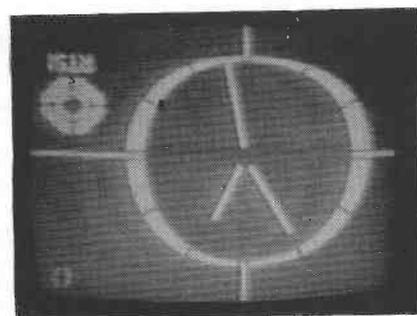


Fig. 6: Austria

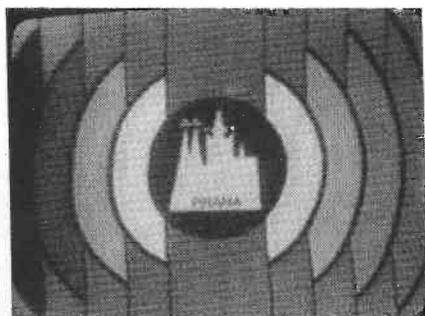


Fig. 7: Czechoslovakia



Fig. 8: Yugoslavia

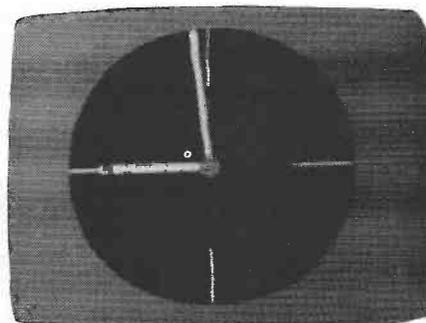


Fig. 9: Switzerland



Fig. 10: Switzerland



Fig. 11: Czechoslovakia



Fig. 12: Cyprus

Swiss-Italian clock (Fig. 9) and Vatican news (Fig. 10).

Between September 13 and October 12, **Edwina and Tony Mancini** (Belper) received pictures from 11 countries: Czechoslovakia, Denmark, East and West Germany, Holland, Norway, Poland, Portugal, Spain, Sweden and the USSR, which is good for the time of year. They logged the West German regionals, SWF/RBG (Raichburg) and SWF/BDN (Baden) and the Norwegian regionals Bagn, Bremanger, Gamlem and Kongs-

berg. On September 14, they noted a new Swedish test card with a larger than usual clock and Sverige with Kanal-1 in place of the old TV1. Later it changed back to the normal TV1 test card.

Among the idents they logged were Televideo (T/text) and TGI (news) from Italy, Jurnal de Tarde (news) from Portugal and HOBCTN (news) from the USSR.

In Bedford, **John Raleigh** received Italian pictures from September 18 to 21 and on days 24, 25 29 and 30 and October 1,

11 and 12. He also received signals from Portugal and Spain on the 18th and Holland (PTT-NED1) almost daily on Ch. E4 from September 17 to October 13 and again on the 17th and 18th.

## Tropospheric

During the opening at the end of August, Bob Brooks received pictures, in Band III, from Belgium (RTBF-1), France (Canal +), Germany (ARD-SFB news Berlin) and Ireland (RTE-1 and 2) and Belgium (BRT TV1). Between 0800 and 1059 on September 21

he received Germany (ARD-ZDF), Holland (PTT NED1) and Ireland. At midday on September 13, he also received amateur (fast scan) television pictures from GW8LIR/P.

The Mancini received pictures from Belgium (RTBF1) on September 13, 14 15 and 25; test cards from Finland (YLE-TV1) and Sweden on the 16th and France (Canal +), with cartoons, pop music and sport, on most days from September 13 to October 12. Signals from Ireland (RTE 1 and 2), with news, sport and

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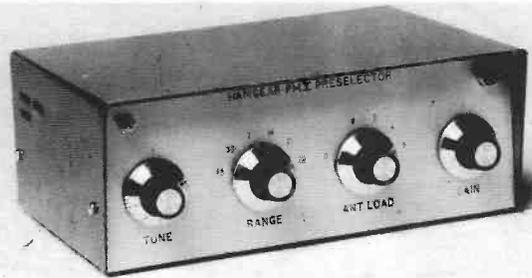
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# SEEN & HEARD

*Wogan*, reached them on September 18, 20, 21, 26, 28 and 29.

John Raleigh received BRT on September 19, 20, 22 and 27, RTBF-1 on most days between September 17 and October 6 and Canal + almost daily from September 17 to October 10.

**George Garden** (Edinburgh) observed closely the ridge of high atmospheric pressure which was predominant over the UK toward the end of September and early October. While staying in Laurencekirk, at 0944 on October

4, he checked the u.h.f. band with his JVC CX610 and found strong coloured pictures from Blackhill.

In Barbados, **Dale Jordan** can receive pictures from Colombia and Venezuela, on Chs. 3, 4 and 5 with a 9-element cross-phased antenna, when it is raining.

## SSTV

"SSTV signals have been few and far between, but on October 3 there was a lot of activity in this mode and most signals were very

strong." wrote **Peter Lincoln** from Aldershot. Peter copied CQ captions from HA5XY and SP4KM, a QSO between EA7JS and OK3CKW Fig. 11, and a photograph of SM5EEP in his shack.

"SSTV conditions have been very poor on 14 and 21MHz, although I did manage to work CT1, EA, HA, IS0, SP, SV and W1," said **Les Hobson GOCUI** (Rotherham). However on October 3, Les put out an SSTV CQ and could not believe his luck when a reply came from A4XJR in

the Sultanate of Oman. "This contact sent the adrenalin going and I left the shack rather pleased," remarked Les with his first-timer tally increased to 233.

In Millom, **Raymond Gilchrist** received SSTV signals, on 14MHz, from 5B4JE Cyprus (Fig. 12) at 1611 on September 3, C31SD Andorra at 1914 on the 13th, DL7AKF at 1910 on the 26th and Andorra, Bulgaria, Czechoslovakia, Finland, France, Greece, Hungary, Italy, Poland, Spain and the UK during the weekend of October 4 and 5.

## DX Report

(Note: LW & MW frequencies in kHz, SW in MHz: Time UTC) **Long Wave DX:**

With the approach of the shortest day, many DXers have been busy testing out new loop antenna designs in the hope of pulling in some of the weaker l.w. stations noted on certain frequencies after dark!

One of the DXers who sent along details of his latest loop was **David Edwardson** of Wallsend. It consists of a 0.23m by 0.27m frame around which is wound 55 turns of 22 s.w.g. wire to form the main loop. A 3.9mH inductor is wired in series with the main loop and a 500pF capacitor tunes the assembly to resonance. A 3 turn winding of 18 s.w.g. wire around the loop provides the coupling to the receiver. The tuning is sharp and covers the range 85 to 600kHz. David has been comparing the performance of the loop with his outdoor trap dipole tuned as a Marconi "T" antenna — although the strength of the received signals is about one 'S'-unit lower on the loop, the directional properties of the loop offer a great advantage over the non-directional "T" antenna.

Valved receivers are popular with many l.w. DXers. Writing from Cardiff, **John Berridge** says he finds that his old valved receiver is still the best because it provides a silent background when used with an outside long wire antenna — so important if the really weak signals are to be heard. **Jim Willett** uses an ex-USAAF BC348 valved communications receiver in Grimsby and tunes his "V" antenna to resonate on the l.w. band with a home made "Trombone" a.t.u. A new 1 valve receiver for the long and medium wave bands has been constructed by **Ron Pearce** in Bungay — it uses an ex-Army AR8 (HL23DD) valve. His list for the chart certainly shows what can be done with a few component and a little patience!

In London, **Phil Townsend** compiled his list for the chart while testing out a new Panasonic RF-1680L portable. He says that the

## LONG MEDIUM & SHORT

*Brian Oddy G3FEX  
Three Corners, Merryfield Way, Storrington.  
West Sussex RH204NS*

volume and other controls are operated by touch instead of the usual knobs or sliders, so assessing a signal rating is rather difficult since there is no indication of the setting of the volume control. **Colin Diffell** also used a portable with an internal ferrite rod antenna to compile his list in Corsham. He says that in addition to the stations noted he heard several weak and unreadable stations in the background — this is a common problem and the only answer may be to build a good loop antenna.

In an interesting letter from West Kilbride, **Roy Hill** says he has been using the broadcasts from Donebach, W. Germany on 153kHz as a language tutor for some years. The publicity material which he has received from Deutschlandfunk indicates that during the hours of darkness the transmitter power is reduced from 500kW to 250kW, so no doubt that explains the reduction in signal strength noted at night by **Philip Rambaut** in Macclesfield — see LMS October '87. Apparently the antenna system at Donebach is directional with the radiation curtailed to the South East so as to lessen interference with Brasov. A QSL card sent in by **Glen Glen-Davison** of Newcastle-upon-Tyne depicts the view from one of the masts at the Donebach — see Fig. 1.

Roy uses a battery powered Boots TR900 transistor portable receiver in conjunction with a loop antenna to receive Donebach — it enables him to "null-out" Brasov because their signals arrive 17 degrees to the north of those from Donebach. His interesting loop depicted in Fig. 2 uses an over coupled secondary to increase the bandwidth of the loop response.

Writing from "down under" in Southport, Queensland **John Ratcliffe** says he has been

monitoring 200kHz in the hope of hearing signals from the BBC Droitwich transmitter, but so far this year he has had no luck.

## MW Transatlantic DX.

Reception conditions are gradually improving as the hours of darkness increase. The earliest signals to cross the Atlantic just now appear to stem from CJYQ in St. John's, Newfoundland on 930 — they were logged in Glasgow by **Alexander Little** as early as 2145 during one night and rated SINPO 22332! The Caribbean Beacon, Anguilla on 1610 is a close runner up — their signals were logged as 22322 by Alexander at 2248. Both of these times are exceptional, but a check on those frequencies before going to bed may well be worthwhile. Checking them at the times quoted in the chart is more likely to result in an entry in your log!

In Redhill, **George Morley** used a home made 1m square loop with his new Trio R5000 receiver to prepare his list for the chart. The loop is wound around an "X" frame constructed from two lengths of 16mm square hardwood and short lengths of 20mm dowel. George says that when using the loop the received signals are only about one 'S'-unit down on his outdoor long wire antenna and it does a very good job directionally — however it is a bit cumbersome!

Jim Willett used his trusty RCA AR77 receiver with a "V" antenna to compile his interesting list of DX — it contains several stations not heard by other DXers. **Tim Shirley** has been burning the midnight oil in Bristol and logged several stations in North Carolina and one in Texas, USA. Since they have not been mentioned before in

this series, they are subject to confirmation by QSL.

Listening in Belfast, **Bill Kelly** also added a station in North Carolina to his extensive list of DX, namely WBT in Charlotte on 1110 — he listened to their bulletin of local news and rated their overall signal as 2. A bulletin of news from the Florida area attracted his attention at 0500 — this proved to be from another station new to him, namely WCRJ in Jacksonville on 1530. Reception of their signal was good with an overall rating of 2. Bill now awaits confirmation by QSL.

**Leo Gieske** has been checking the band in Randburg, S. Africa mainly between 0330 and 0430. His log included two stations which have not been previously mentioned in this series — WLAC in Nashville, Tennessee on 1510 and CBJ in Chicoutimi, Quebec on 1580.

## Other MW DX

Leo Gieske has once again been hearing ILR Capital Radio, London on 1548 in Randburg! Several more European stations were logged by him between 0330 and 0430, namely Nice, France 1350; Saarbrücken, W. Germany 1422; Marnach, Luxembourg 1440; Monte-Carlo, Monaco 1467; Wein-Bisamberg, Austria 1476; Mainflingen, W. Germany 1539; Sarnen, Switzerland 1566 and Langenberg, W. Germany 1593 — a remarkable list. However, Leo says that m.w. propagation conditions are generally less favourable than in previous years — there was an early start to the "static season" this year and high levels of thunderstorm activity now make reception difficult on the lower frequencies.

**John Nash** has been testing out his new Matsui MR4099 portable on this band during the evening in Brighton and logged two stations in Algeria — Ain Beida 531, which rated as SINPO 33443 at 1920 and Algiers 891, noted as 54555 at 1941. He also picked up a number of stations in Spain including Madrid on 585, 657,

# SEEN & HEARD

Freq kHz	Station	Country	Power (kW)	DXer
153	Brasov	Romania	1200	H*,J*
153	DLF Donebach	W.Germany	500	A,C,D*,F,G,I,J
153	Ufa	USSR	100	J*
162	Allouis	France	2000	A,B*,C,D*,E*,F, G,H,I,J
171	Kaliningrad	USSR	1000	C,J*
171	Medi 1 Nador	Morocco	1200	D*,F,G*,J*
177	Orianenburg	E.Germany	750	A,C,D*,F,G,I,J
180	Ankara	Turkey	1200	H*
182	Polati	Turkey	1200	F*,J*
183	Saarlouis	W.Germany	2000	A,B*,C,D*,E*,F,G,I,J
189	Motala	Sweden	300	C,F,G*,J
200	BBC Droitwich	UK	400	A,B,C,D,F,G,I
200	Warsaw 3	Poland	?	J*
209	DLF Munich	W.Germany	500	C,E,F,G
209	Azilal	Morocco	800	F*,G*,H*,J*
209	Kiev	Ukraine	500	H*
218	Roumoules	Monaco	1400	A,C,D*,E*,F,G,I,J
218	Oslo	Norway	200	F*,G*,J
227	Konstantinow	Poland	2000	C,D*,E*,G,J*
236	Junglinster	Luxembourg	2000	A,B*,C,D*,F,G,I,J
236	Kishinev	USSR	1000	F*,J*
245	Kalundborg	Denmark	300	A,B*,C,D*,E,F,G,I,J
245	Erzurum	Turkey	200	J*
254	Tipaza	Algeria	1500	A,B*,C,D*,E*,F,G,J
254	Lahti	Finland	200	C,F*
263	Burg	E.Germany	200	C,F,J*
263	Moscow	USSR	2000	D*,H*
272	Topolna	Czechoslovakia	1500	B*,C,F,G,I,J
281	Minsk	USSR	500	D*,F*,G*

Note: —  
Entries marked \* logged during darkness.  
All other entries were logged during daylight.

## DXers: —

- (A) John Berridge, Cardiff.
- (B) Colin Diffell, Corsham.
- (C) David Edwardson, Wallsend.
- (D) Paul O'Connor, Birmingham.
- (E) Ron Pearce, Bungay.
- (F) Philip Rambaut, Macclesfield.
- (G) John Sheridan, Mapperley.
- (H) Tim Shirley, Bristol.
- (I) Phil Townsend, London.
- (J) Jim Willett, Grimsby.

810, 918 and 954; La Coruna 639; Seville 684 and 792; Oviedo 729; Barcelona 738; San Sebastian 774 and Murcia 855 — all were logged between 1800 and 2030. At 0400, **Daniel Masterson** listened to the broadcasts from RNE-1 via Murcia on 855 in Stoke-on-Trent and rated their signal SIO 444.

Some interesting stations were logged during the night by Bill Kelly including Ain Beida, Algeria 531; Beromunster, Switzerland 531; Faro, Portugal 560; Riyadh, Saudi Arabia 585; Muge, Portugal 594; Lyon, France 603; Nineva, Iraq 603; Wavre-Overijse, Belgium 620; Batra, Egypt 621; Santah, Egypt 864; Alger, Algeria 891; Milan, Italy 900; Madrid, Spain 918; Azurara Portugal 1062; Krasnodar, USS R1089; Bratislava, Czechoslovakia 1098; Kaliningrad, USSR 1116; Zadar, Yugoslavia 1134; Strasbourg, France 1161; Vila Real, Portugal 1170; Minsk, USSR 1197; Bordeaux, France 1206; Wroclaw, Poland 1206; Lushnje, Albania 1215; Wolvertem, Belgium 1512.

Darran Taplin has been checking the band during the

evening in Tunbridge Wells and logged Radio Algiers, Algeria on 981 as SINPO 44444 at 1955 — this broadcast runs in parallel with their l.w. transmission on 254kHz. He also logged Radio Prague, Czechoslovakia 1287 as 54544 and DLF via Neumunster, W. Germany 1269 as 54544. Saarbrucken, W. Germany 1422 was heard for the first time by Tim Shirley. A bulletin of news, broadcast via Radio Moscow's World Service 1000kW transmitter in Leningrad, USSR on 1494 was received by Glen Glen-Davison at 2220 — SINPO 44444.

No doubt Radio Finland will welcome reports on the signals from their new transmitting station in Pori on 963 — David Edwardson rated their signal at SINPO 44544 at 1845 and noted a great improvement on their transmissions from Turku. The signals from Pori now compare well with Radio Sweden's broadcast via Solvesborg on 1179, which Paul O'Connor rated as SINPO 54555 at 2100 while using a car radio with a 6m wire antenna in Birmingham. The broadcasts from Radio Sweden are popular with many UK listeners — John Berridge says he listens every night to their news broadcast intended for listeners in Nordic countries and in Morden, **Sheila Hughes** has been following their "Beginners' Guide to DXing" series and is a regular listener to their famous "Sweden Calling DXers" programme.

The broadcasts from Radio Norway via Kvitsoy on 1314 are also well received at night in the UK and it is also possible to hear their broadcasts during the day in some areas of the UK — **Robert**

**Taylor** logged their signal in Edinburgh as SIO 555 at 1315! At night he has been listening to the BBC 648 programmes via Orfordness 648; BBC Radio Ulster via Lisnagarvey 1341 and to Manx Radio, Isle of Man 1368.

The BBC 648 broadcasts have also been attracting the attention of **Leslie Bliss** in Knaresborough — the signal is S3 during daylight and reception is good. Some slight co-channel interference exists after dark, but reception is generally good and the signal peaks S4. **Dave Fairhurst** of Enfield informs me that the BBC Information Centre and Shop at Bush House, Strand can supply BBC 648 broadcast schedules and many other books and items of interest to DXers, so if you are in London be sure to pay it a visit!

Writing from Thessaloniki, Greece, **George Efstratiades** says the BBC 648 broadcast peaks SIO 333 at 2220, but he has also noted co-channel interference. Some of the other broadcasts **George** has been hearing during the evening stem from Solvesborg, Sweden 1179; Novi-Sad, Yugoslavia 1269; Litomysl, Czechoslovakia 1287; Wien-Bisamberg, Austria 1476; Stargard, Poland 1503 and Cyclops, Malta 1557.

**Phil Townsend** has been exploring the band with his new Panasonic RF-1680L portable. During daylight he logged \*Waver Overijse, Belgium 540; RTE-1 Tullamore, S. Ireland 567; \*Stuttgart, W. Germany 576; \*Paris, France 585; BBC Orfordness 648; Lopik, Holland 675; Flevoland, Holland 747; Wolvertem, Belgium 927; Flevoland, Holland 1008 and \*Langenburg, W. Germany 1593 — those marked (\*) were new to him. At dusk some additional stations were logged, namely Beromunster, Switzerland 531; Bayreuth, W. Germany 549; Wien-Bisamberg, Austria 585; Frankfurt, W. Germany 594; RTE-2 Athlone, S. Ireland 612 and Praha, Czechoslovakia 639.

Using a Yaesu FRG-7700 receiver with a long wire antenna in Stockton-on-Tees, **Alan Curry** has been listening to a baseball commentary from AFN Frankfurt, W. Germany 873 and to country music broadcast by VOA via Munchen-Ismaning, W. Germany 1197 — he rated VOA as SINPO 44434 at 1630 and AFN as 54444 at 2035. The report from **Sheila Hughes** included four stations which were not mentioned by other DXers, namely Lushjne, Albania 1395; TWR Monte-Carlo, Monaco 1467; Stargard, Poland 1503 and

Vatican Radio, Rome 1530 — all were heard between 1830 and 2100 and rated as SINPO 43343.

## MW Local Radio DX

**Sheila Hughes** has been taking a first look at the local radio scene and says "I have really enjoyed seeking out the stations". **Sheila** discovered that she could only hear Radio Norfolk by sitting half way up the stairs with her Vega 206 portable! In sending along his first log for the chart from Chesterfield, **Martin Ellis** says "I usually listen in the mornings before TV's are put on, as I suffer very bad interference". **Martin** uses a Realistic DX302 in conjunction with a 13m random wire antenna. TVI is a very common problem, but a considerable improvement may result by using a good loop antenna to "null-out" the worst of the interference — it can also be used at other times to separate the stations operating on shared frequencies!

A "Soooper Loop" (PW July '86) was used with a Yaesu FRG-7700 receiver to compile the extensive list sent in by **John Sheridan** of Mapperley. In Forfar, **Stewart Russell** has been putting his "Soooper Loop" to good use too — he says "The loop has enabled me to receive ILR's Forth 1548, Tay 1584, NorthSound 1035, Moray Firth 1107 and Clyde 1152 much more clearly".

An impressive list was sent along by **Bill Eyre** of Stockport — he used his new Trio R5000 receiver with a long wire antenna. Writing from Chichester, **Peter Hall** says "I have added a Datong FL3 filter to the Eddystone receiver — this has made a vast difference to the listening quality of all the stations".

## Short Wave DX

Since we are now on the upward slope of the next solar sunspot cycle, it seems that two broadcasters have decided to make test transmissions on the 25MHz (11m) band. At the time of going to press, little is known about the tests or the exact beam headings. **Leslie Hollis** of Grantham sent along the first report to me on a transmission to Africa from Radio Norway International, Oslo on 25.730 at 1000 — their signal was rather poor, rating SINPO 25332, but at least it was possible to identify the station!

During the last few days I have been hearing transmissions from Radio Nederland on 25.970. The station announcements in English at 0830 refer to their Asian

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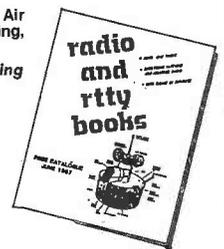
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# SEEN & HEARD

Freq MHz	Station	Location	Time (UTC)	DXer
850	WHDH	USA	0210	H
940	WFNC	Boston, Mass.	0230	G
990	KGTM	Fayetteville, NC.	2359	G
1010	WFGW	Wichita Falls, Tex.	0130	G
1010	WINS	New York, NY.	0045	E,G
1030	WBZ	Boston, Mass.	0515	E
1050	WHN	New York, NY.	0330	E
1100	WWWE	Cleveland, Ohio.	0120	C,G,H
1110	WBT	Charlotte, NC.	0205	C
1130	WNEW	New York, NY.	0400	E
1160	KSL	Saltlake City, Utah.	0230	G
1210	WCAU	Philadelphia, Pa.	0210	H
1440	WFTQ	Worcester, Mass.	0310	H
1510	WLAC	Nashville, Tenn.	0350	B
1520	WWKB	Buffalo, NY.	0345	B
1530	WCKY	Cincinnati, Ohio.	0330	B
1530	WCRJ	Jacksonville, Fla.	0500	C
1540	WPTR	Albany, NY.	0350	B
1540	KXEL	Waterloo, La.	0700	G
1560	WQXR	New York, NY.	0345	B
1600	WWRL	New York, NY.	0400	B
590	VOCM	CANADA	2330	A,E
930	CJYQ	St. John's, Nfld.	2330	A,C,D,E,H
950	CHER	Sydney, NS.	0330	E
1010	CFRB	Toronto.	0150	H
1110	CBD	St. John, NB.	0150	C
1200	CFGO	Ottawa, Ont.	0150	C
1220	KCKW	Moncton, NB	0150	E,H
1370	CFVD	Ville Degelia, Que.	0240	H
1570	CKLM	Lavel, Que.	0410	B,C,H
1580	CBJ	Chicoutimi, Que.	0400	B
1100	XEBV	C.AMERICA & CARIBBEAN	0330	G
1110	XERED	Mexico City, Mexico.	0136	G
1570	Atlantic Beacon	Turks & Caicos Is.	0325	B,C,E,F
1580	VOA	Antigua.	0345	B
1610	Caribbean Beacon	Anguilla.	0325	B,C,D,E,H
950	R. Vision	SOUTH AMERICA	0235	H
1220	R. Globo	Caracas, Venezuela.	0330	B
1260	R. Muhler	Rio, Brazil.	0335	B
1350	R. Buenos Aires	Sao Paulo, Brazil.	0340	B
		Argentina.		

## DXers

- (A) David Edwardson, Wallsend.
- (B) Leo Gieske, Randburg S. Africa.
- (C) Bill Kelly, Belfast.
- (D) Alexander Little, Glasgow.
- (E) George Morley, Redhill.
- (F) Ron Proudfoot, Newcastle-upon-Tyne.
- (G) Tim Shirley, Bristol.
- (H) Jim Willett, Grimsby.

Service, but the frequencies they quote do not include 25.970. An announcement at 0927 refers to their Indonesian Service and again omits this frequency.

Perhaps these transmissions are directed towards Madagascar, because the satellite communication centre there is undergoing repairs and normally feeds their relay transmitter in Talata Volon. Reception is very variable here and much fading and phase distortion exists. If you are hearing these transmissions, please send a report to Radio Nederland — also a copy to me for inclusion in LMS!

The reception conditions prevailing on the 21MHz (13m) band are generally unstable, but a number of broadcasters make use of the band during the day to reach listeners in selected target areas. One of the early morning transmissions stems from Radio Japan, Tokyo and reaches listeners via

Moyabi, Gabon on 21.695 — following their news bulletin, Alan Curry logged their signal as SINPO 22322 at 0715.

Commencing at 0700, RFI broadcasts to listeners in E. Africa via Allouis, France on 21.620 until 1800 — their programmes are mainly in French, but there are some items in English. The reception of their signal is often good in the UK — Robert Taylor noted SIO 444 in his log at 0805. UAE Radio Dubai also make an early start — they beam their programmes in Arabic to listeners in N. Africa on 21.605 from 0615. Although their programmes are mainly in Arabic, there are some segments in English — Leslie Biss has been listening to them and logged their signal as SINPO 35534 at 1350.

Using a JRC NRD 515 receiver with a random wire antenna and Mizuho KX-3 a.t.u., Glen Glen-Davison logged during the early afternoon Radio Nederlands via their relay in Talata Volon, Madagascar on 21.480 (SINPO 55544); Radio Prague, Czechoslovakia 21.505 (55435); REE via Noblejas, Spain 21.575 (45534) and Radio RSA Johannesburg, S. Africa 21.590 (55545).

The broadcasts from Radio RSA on 21.590 are intended for listeners in W. Africa and Europe — Their programmes cover a wide variety of interesting topics and may be heard from 1300 until 1556. Daniel Masterson mentioned their popular 'Mailbag' programme in his report and noted their signal as SIO 333 at 1525. In Sheffield, Cyril Kellam has been listening to some of the interesting topics broadcast by Radio Japan, Tokyo and relayed to Europe via Moyabi, Gabon on 21.700 from 1500. Using a Realistic DX-360 portable receiver, Cyril rated their signal as SIO 444, but sometimes reception is poor.

Writing from London, Bill Griffith says he took a very small Panasonic RF-9 battery receiver with him on a visit to Romania recently. While in Bucharest, he used it with its own little telescopic whip antenna and picked up REE Spain, broadcasting to the Middle East via Noblejas on 21.575 at 1745.

John Parry has been monitoring the band during the evening in Northwich and logged two broadcasts to W. Africa from the USA — these stemmed from the Christian Science Monitor station WCSN in Boston on 21.515 (SINPO 44554 at 1850) and from WYFR in Oakland, California via their transmitter in Okeechobee, Florida on 21.525 (34554 at 2040).

The reception conditions prevailing on the 17MHz (16m) band are also generally unstable, but there has been a marked improvement in long distance reception. Although the broadcasts from Radio Australia on 17.715 are beamed on S.E. Asia from 0100 until 0900, they also become audible in the UK around 0630, having travelled via the 'long path' across the Pacific to reach us. Ian Curry is one of the many UK listeners who follow their sporting events and other items around 0700 — he uses a Yaesu FRG 7700 receiver with a long wire antenna in Stockton-on-Tees.

The broadcasts to E. Asia from KYOI in Saipan, N. Mariana Islands on 17.780 have also been reaching the UK well in the morning — David Edwardson logged their signal as SINPO 34433 at 0745. Using a one valve (955) receiver, Ron Pearce picked up Radio Afghanistan via Moscow, USSR 17.655 at 1038 (Push-to/Dari to S. Asia 0500-1200); Radio Pakistan, Islamabad 17.660 at 1120 (Urdu/English 0715-1120) and WCSN Boston, USA 17.640 at 1144 (English/French/German to S. Africa 1000-1155)!

Some of the other interesting broadcasts noted by DXers during daylight include UAE Radio Dubai 17.775/17.865 (Arabic/English to Europe 0615 to 1500), logged

by David Edwardson at 1040 as SINPO 44544; Radio RSA Johannesburg, S. Africa 17.780 (French/English to W. Africa 1200-1656), rated as 44433 by Darran Taplin at 1300; RTV Tangier, Morocco 17.595 (Arabic to Middle East 1400-1700), rated by John Nash as 55555 at 1408; RFI via Allouis, France 17.620 (French/English to E. Africa 0700-1655), rated as 55555 by Alan Curry at 1617.

During the evening the broadcasts from S. America, the USA and Canada dominate the band — some of them were mentioned in the reports, namely Radio Surinam International 17.755 (Dutch/English to Europe via RNB Brazil 1700-1810), noted by Neil Dove in Lockerbie as 55544 at 1800; Radio HCJB Quito, Ecuador 17.790 (Czech/German/English/Norwegian/French/Spanish to Europe 1800-2230), logged by John Sadler in Bishops Stortford at 1900; RCI Montreal via Sackville, Canada 17.875 (Polish/French/English/Russian to Europe 1800-2100), logged by Bill Griffith while in Bucharest, Romania; VOA via Bethany, USA 17.780 (English to W. Africa 1600-2300), rated by Peter Hall as SIO 222 at 2130.

The 15MHz (19m) band is the hub of listening activity for many DXers because there are so many interesting broadcasts to choose from during the day! An improvement in the reception conditions prevailing on this band has enabled DXers to hear signals from all continents. Although there have been no reports of the broadcasts from Radio New Zealand reaching DXers in the UK, they have been heard recently on 15.150 in New York! Chris Arniotis heard their time signals for 0200 followed by a news bulletin in English intended for listeners in the Pacific area — he used a Sony ICF 7600D portable in conjunction with a vertical wire antenna 20m long and logged their signal as SIO 323.

The broadcasts from Radio Australia to the S. Pacific on 15.240 have been reaching the UK around 2200. Bill Reid logged them in Finchampstead and also noted their transmission to Asia on 15.395 at 2225 — both rated SIO 343. Most of the transmissions from Radio Australia are monitored from 0400 on a daily basis in Torquay by George Hewlett. His latest report indicates that the signals on 15.240 peak SIO 322 around 0545, but severe co-channel interference exists later and makes reception impossible.

Many interesting 19m stations were mentioned in the reports from DXers — in the early morning, Jim Willett logged the Voice of Nigeria, Lagos 15.120 at 0500 (English/French to Europe 0500-0657) and George Morley

# SEEN & HEARD

Freq kHz	Station	ILR or BBC	DXer
585	R.Solway	B	I
603	Invicta Sound	I	C,D,F*,H*,J,K*,N,O
630	R.Bedfordshire	B	B,E,H*,J,L,M*,N,O
630	R.Cornwall	B	F*,G
657	R.Ciwyd	B	B,C,J,K,O
657	R.Cornwall	B	G
666	DevonAir R.	I	D,G
666	R.York	B	B,C,J,M,O
729	BBC Essex	B	B,C,J,L,N,O
756	R.Cumbria	B	M,O
756	R.Shropshire	B	B,C,H*,J
765	BBC Essex	B	B,C,J,K,L,N,O
774	R.Kent	B	D,J,M,N
774	R.Leeds	B	A,B,C,J,K*,O
774	Severn Sound	I	H*,J
792	Chiltern R.	I	B,C,E*,G,J,L,N,O
801	R.Devon	B	B,C,D,J,K*,O
828	R.WM	B	H,J
828	R.Aire	I	A,B,C,J,O
828	Chiltern R.	I	E*,J,L,N,O
837	R.Cumbria	B	C,O
837	R.Furness	B	O
837	R.Leicester	B	B,C,J,M*,N,O
855	R.Devon	B	G
855	R.Norfolk	B	E,G,J,L,N,O
855	R.Lancashire	B	C,J
873	R.Norfolk	B	B,C,E,J,K*,L,M*,N,O
936	GWR	I	D,G,H*,J,O
945	R.Trent	I	B,C,G*,J,O
954	Devonair	I	I*
954	R.Wyvern	I	C,J,O
990	Beacon R.	I	C,H,J,O
990	Hallam R.	I	B,C,J,O
999	Red Rose R.	I	A,C,I*,O
999	R.Solent	B	D,K
999	R.Trent	I	B,J,O
1026	R.Cambridgeshire	B	B,C,E,J,N,O
1026	Downtown R.	I	O
1026	R.Jersey	B	G,K*
1035	R.Kent	B	G,K*,N,O
1035	NorthSound R.	I	I,O
1035	R.Sheffield	B	B,C,J,O
1107	Moray Firth R.	I	I,O
1107	R.Northampton	B	B,J,O
1116	R.Derby	B	A,B,C,F*,J,O
116	R.Guernsey	B	G,K
1152	BRMB	I	B,H,J
1152	R.Broadland	I	F*,I*,M*,O
1152	R.Clyde	I	I
1152	LBC	I	G,K,L,N
1152	Metro R.	I	K*,O

Freq kHz	Station	ILR or BBC	DXer
1152	Piccadilly R.	I	C,O
1161	R.Bedfordshire	B	J
1161	R.Sussex	B	L
1161	R.Tay	I	C,I
1161	Viking R.	I	B,C,J,O
1170	R.Orwell	I	L,O
1170	Signal Radio	I	B,C,J
1170	Swansea Sound	I	O
1170	Ocean Sound	I	E
1242	Invicta Sound	I	E,G,J,N,O
1251	Saxon R.	I	G,L,O
1260	GWR	I	G
1260	Marcher Sound	I	C
1260	Leicester Sound	I	B,J,O
1278	Pennine R.	I	C,O
1305	R.Hallam	I	B,C,J,O
1323	Southern Sound	I	D,E,L
1332	Hereward R.	I	B,C,I*,J,N,O
1359	Essex R.	I	C,E,G,L,N,O
1359	Mercia Sound	I	B,C,H*,J,M*
1359	R.Solent	B	D
1368	R.Lincolnshire	B	B,C,J,O
1368	R.Sussex	B	N
1431	Essex R.	I	G,L
1431	Radio 210	I	H*,O
1449	R.Cambridgeshire	B	H*,J,M*,O
1458	R.London	B	D,G,N
1458	R.Manchester	B	C
1458	R.WM	B	B,D,H*,J,K
1476	County Sound	I	C,E
1485	R.Humberside	B	C,M,O
1485	R.Merseyside	B	C
1485	R.Oxford	B	K*
1485	R.Sussex	B	D,K*
1503	R.Stoke-on-Trent	B	B,C,F*,J,O
1521	R.Mercury	I	C,E,F*
1521	R.Nottingham	B	B,J,O
1530	Pennine R.	I	C,I*,O
1548	Bristol	B	F*
1548	Capital R.	I	F*,G,H*,N
1548	R.City	I	O
1548	R.Forth	I	I
1548	R.Hallam	I	B,C,J
1557	Hereward R.	I	J
1557	R.Lancashire	B	C
1557	Northants 96	I	B
1557	Ocean Sound	I	D,F*
1584	R.Nottingham	B	B,C,F,J,O
1584	R.Shropshire	B	F
1584	R.Tay	I	F,I,M,O
1602	R.Kent	B	C,E,G,H*,J,N,O

Note:—  
Entries marked \* were logged during darkness.  
All other entries were logged during daylight.

## DXers

- (A) Alan Curry, Stockton-on-Tees.
- (B) Martin Ellis, Chesterfield.
- (C) Bill Eyre, Stockport.
- (D) Peter Hall, Chichester.
- (E) Sheila Hughes, Morden.
- (F) Bill Kelly, Belfast.
- (G) John Nash, Brighton.
- (H) Paul O'Connor, Birmingham.
- (I) Stewart Russell, Forfar.
- (J) John Sheridan, Mapperley.
- (K) Tim Shirley, Bristol.
- (L) Darran Taplin, Tunbridge Wells.
- (M) Robert Taylor, Edinburgh.
- (N) Phil Townsend, London.
- (O) Jim Willett, Grimsby.

heard their transmission to N. Africa on 15.120 at 0735 (English/Arabic, 0700-0957). During the day George logged Radio Bangladesh, Dhaka 15.525 at 1254 (English to Europe 1230-1300); Radio Beijing, China 15.165 at 1500 (English to S. Asia 1400-1555); BBC via Ascension Island 15.400 at 1510

(English to Africa 1500-1800) and VOA via Colombo, Sri Lanka 15.395 at 1535 (English to S. Asia 1300-1900). John Nash logged the Voice of Vietnam, Hanoi 15.010 at 1320 (French/English to Europe 1300-1400); Riyadh, S. Arabia 15.060 at 1556 (Arabic to N. Africa 1100-1700) and UAE Radio Dubai 15.320 at 1610 (Arabic/English to Europe 1500-2050).

The reports compiled during the evening included Africa No. 1, Gabon 15.475 at 2000 (French/English to W. Africa 1700-2300), noted by Bill Griffith; RNB Brasilia, Brazil 15.265 (English/German to Europe 1800-1950), rated as 44434 at 1835 by Alan Curry; Radio Sophia Bulgaria 15.310 at 1914 (English/Portuguese/French to Africa 1430-2030) and Radio Cairo, Egypt 15.335 at 1936 (Zulu/French to W. Africa 1930-2230), logged by Colin Diffell; RCI Montreal via Sackville, E. Canada 15.325 (French/English/Russian to Europe 1830-2200), rated by Peter Hall

as 333 at 2000. Three stations in the USA were also mentioned — WHRI South Bend, USA 15.105 (English to Europe 1700-2100), rated as 424 at 1945 by Bill Reid; WINB Red Lion, USA 15.185 (English to N. Africa 2003-2245), rated as 34333 by Sheila Hughes at 2030 and WRNO New Orleans, USA 15.420 (English to Europe 1900-2100), rated as 222 by Julian Wood in Buckle.

A station which is seldom mentioned, namely Radio Sistema Nacional, Chile on 15.140 (Spanish to S. America 2230-0400) was logged by two DXers — David Gover of Newton-le-Willows, who used a Realistic DX-302 receiver with a dipole antenna and Stephen Taylor of Gateshead, who used a Sony ICF 5900W receiver with a 10m outdoor wire antenna — he rated their signal as SIO 444 at 2300.

Although the 13MHz (22m) band is dominated by Radio Moscow, several other broadcasters use this band during the day. At 0800, Jim Willett heard

Radio Korea, Seoul, S. Korea on 13.670, broadcasting to Europe in German, English and Italian (0615-0830) — he also heard Radio

## DXers

- (A) Leslie Biss, Knaresborough.
- (B) Alan Curry, Stockton-on-Tees.
- (C) Neil Dove, Lockerbie.
- (D) David Edwardson, Wallsend.
- (E) Glen Glen-Davison, Newcastle-upon-Tyne.
- (F) David Glover, Newton-le-Willows.
- (G) Bill Griffith, (in Bucharest).
- (H) Bill Kelly, Belfast.
- (I) Alexander Little, Glasgow.
- (J) Dick Moon, George, S. Africa.
- (K) George Morley, Redhill.
- (L) John Nash, Brighton.
- (M) Fred Pallant, Storrington.
- (N) John Parry, Northwich.
- (O) Ron Pearce, Bungay.
- (P) Ron Proudfoot, Newcastle-upon-Tyne.
- (Q) Philip Rambaut, Macclesfield.
- (R) John Sadler, Bishops Stortford.
- (S) Leslie Sargent, Runcorn.
- (T) John Sheridan, Mapperley.
- (U) Tim Shirley, Bristol.
- (V) Stephen Taylor, Gateshead.
- (W) Robert Taylor, Edinburgh.
- (X) Keith Wakelin, Hull.
- (Y) Jim Willett, Grimsby.

# SEEN & HEARD

Freq MHz	Station	Country	UTC	DXer
2.380	R.Limeria	Brazil	2345	U
2.380	FBS	Falklands	0145	Y
2.390	RRI Cirebon	Indonesia	1628	J
2.420	R.Sao Carlos	Brazil	2158	J
2.485	ABC Katherine	Australia	2037	J
2.490	VOS.1 Fuzhou	China	1915	U
2.560	Xinjiang	China	2300	S
2.490	RRI Semarang	Indonesia	2040	J
3.200	TWR	Swaziland	2359	Y
3.205	R.Ribeirao	Brazil	0019	J
3.210	R.Mozambique	Mozambique	0125	Y
3.215	R.Orange	S.Africa	0420	H,U
3.220	T.Togo, Lome	Togo	0533	U
3.230	ELWA Monrovia	Liberia	2136	U
3.230	R.RSA	S.Africa	0324	U
3.235	R.Clube Marilia	Brazil	0335	P
3.270	SWABC 1	Namibia	0415	H
3.300	R.Cultural	Guatemala	0215	Y
3.305	R.Zimbabwe	Zimbabwe	0310	Y
3.320	R.Suid Africa	S.Africa	1945	L
3.325	R.Liberal	Brazil	0355	P
3.325	RRI Palangaraya	Indonesia	2100	U
3.325	FRCN Lagos	Nigeria	2030	D,L
3.340	R.Altura	Peru	0431	P
3.355	R.Nac.Luanda	Angola	2020	L
3.355	R.Botswana	Gaborone	2245	T
3.365	GBC Radio 2	Ghana	2130	Y
3.380	Austrian Army R.	Austria	2045	L
3.905	AIR Delhi	India	2300	J,S
3.910	AFRTS Tokyo	Japan	0500	U
3.915	BBC Kranji	Singapore	2205	K,S,T
3.940	PBS Hubei Wuhan	China	2158	V
3.950	PBS Ginhai Xining	China	2230	S
3.955	BBC Daventry	England	1915	B,W
3.955	R.Orion	S.Africa	2220	L,Y
3.965	RFI Paris	France	2316	E,S,T
3.970	RFE Munich	W.Germany	1955	F,N
3.975	RRI Surabaya	Indonesia	1658	J
3.975	BBC WS Skelton	UK	2100	R
3.985	SRI Berne	Switzerland	1829	B,G
3.995	DW Cologne	W.Germany	2015	N
4.000	R.Greenland	Greenland	1030	Y
4.035	PBS Xizang Lhasa	Tibet	2325	P
4.045	R.Moscow	USSR	1836	T
4.050	R.Frunze	USSR	2325	K
4.060	R.Moscow Kharkov	USSR	1846	L,T
4.065	R.Moscow Ryazan	USSR	1845	A
4.080	R.Ulan Bator	Mongolia	2200	U
4.220	Xinjiang	China	2255	K,P,T,V
4.500	Xinjiang	China	2255	F,S,T,U,V,Y
4.520	Khanty Mansiysk	USSR	1815	L
4.545	Alma Ata	USSR	2346	K,L,T
4.635	R.Dushanbe, Tadzhik	USSR	2310	F,T
4.650	R.Santa Ana	Bolivia	0200	Y
4.735	Xinjiang	China	2315	D,T,V
4.740	R.Afghanistan	via USSR	1833	A,C,H,M,S,T,Y
4.750	R.Bertoua	Cameroon	2100	Y
4.750	R.Lubumbashi	Zaire	1933	J
4.755	R.Educ CP Grande	Brazil	0108	J
4.755	Sani Radio	Honduras	0045	F,T,U
4.755	RRI Ujungpadang	Indonesia	1600	U
4.760	Yunnan Kuming	China	2321	T
4.760	ELWA Monrovia	Liberia	1932	C,S,T
4.760	R.Frontera	Venezuela	2345	U
4.765	R.Moscow	Via Cuba	2326	T
4.770	FRCN, Kaduna	Nigeria	2045	F,H,K,L,M,S,T,X,Y
4.775	AIR Gauhati	India	0148	T
4.775	RRI Jakarta	Indonesia	1545	I,P
4.785	R.Baku	USSR	2055	K,T
4.785	RTM Bamako	Mali	2203	C,H,K,T,X,Y
4.790	R.Atlantida	Peru	0145	F
4.790	Azad Kashmir R.	Pakistan	1712	D,K
4.795	R.Douala	Cameroon	2215	C,F,Y
4.800	R.Popular Cuenca	Ecuador	0450	P
4.800	LNBS Lesotho	Maseru	2101	D,K,L,T,U,Y
4.805	R.Nac Amazonas	Brazil	2352	S,T,Y
4.810	R.Yerevan	USSR	2112	F,K,T
4.815	R.diff TV Burkina	Ouagadougou	2045	D,F,M,S,T,Y
4.820	R.Botswana	Botswana	2055	D,M,S,Y
4.820	Khanty-Mansiysk	USSR	0136	T
4.825	R.Ashkhabad	USSR	1810	K,T

Freq MHz	Station	Country	UTC	DXer
4.830	Africa No. 1	Gabon	2045	A,B,C,F,L,M,O,S,T,W,Y
4.830	R.Reloj	Costa Rica	0119	C,D,T,Y
4.830	R.Tachira	Venezuela	0212	C,D,F,T,Y
4.835	R.Atalaia	Brazil	1915	A
4.835	RTM Bamako	Mali	2045	C,D,F,H,K,L,M,S,T,Y
4.840	R.Bukavu	Zaire	1827	A
4.845	R.Nacional, Manaus	Brazil	0020	C,F,H,T
4.845	ORTM Nouakchott	Mauritania	2045	D,F,L,M,S,T,Y
4.850	R.Tashkent	USSR	0116	T
4.850	R.Yaounde	Cameroon	1945	D,F,H,M,O,S,T,Y
4.850	R.Capital, Caracas	Venezuela	0200	C,F,T,Y
4.860	AIR New Delhi	India	1658	Q
4.865	PBS Lanzhou	China	2056	D,F,K,L,T,U,Y
4.870	R.Cotonou	Benin	2047	F,H,K,M,S,T,Y
4.870	Rio Amazonas	Ecuador	0251	P
4.870	Colombo	Sri Lanka	1722	D
4.880	SABC Radio 5	S.Africa	2105	D,F,K,L,M,S,T,Y
4.885	R.Clube do Para	Brazil	0346	K
4.885	R.Beijing	China	2211	T,V
4.885	Voice of Kenya	Kenya	1825	P
4.895	R.Bare, Manaus	Brazil	0030	P
4.900	R.diff Nat. Conakry	Guinea	2205	H,Y
4.905	N'djamena	Chad	2100	C,D,M,Y
4.905	R.Relegio, Rio	Brazil	0119	T
4.910	R.Maracaibo	Venezuela	0045	U
4.910	R.Zambia	Zambia	2100	M
4.915	R.Ghana, Accra	Ghana	2100	F,L,M,S,Y
4.915	R.Anhanguera	Brazil	0131	T
4.920	R.Quito	Ecuador	0212	T
4.925	R.Nacional, Bata	Eq. Guinea	1945	S
4.930	Ashkabad	USSR	2200	H,T
4.930	4VEH	Haiti	0200	Y
4.930	R.Tbilisi	USSR	2150	C
4.935	R.Monteagudo	Bolivia	0230	U
4.940	R.Abidjan	Ivory Coast	2231	K
4.940	Kiev	USSR	1925	A,K,L,T
4.945	Caracol, Neiva	Colombia	2215	K
4.945	R.Nat.Porto Velho	Brazil	0005	F,T
4.950	R.Mandre de Dios	Peru	0049	P
4.955	R.Baku	USSR	1930	A,K,T
4.970	R.Rumbos	Venezuela	0133	T,Y
4.975	R.Uganda	Uganda	2050	M,T,Y
4.975	Dushanbe	USSR	2311	T
4.980	Azar Kashnir R.	Pakistan	0155	H
4.980	R.Swaziland	Swaziland	1740	P
4.980	Ecos del Torbes	Venezuela	0225	C,D,F,T,Y
4.985	R.Brazil Central	Brazil	0215	D,H,T
4.990	AIR New Delhi	India	0040	T
4.990	FRCN, Lagos	Nigeria	2115	B,D,F,H,K,L,Y
4.990	Radio RSA	S.Africa	0430	H
4.990	R.Animas	Bolivia	0300	U
4.990	R.Ancash	Peru	0230	P
5.005	R.Nacional, Bata	Eq. Guinea	1958	C,F,K,L,M,T,Y
5.005	R.Nepal	Khumaltar	1630	P,Y
5.010	R.Garoua	Cameroon	2100	B,F,H,K,L,M,S,T,Y
5.010	R.Singapore	Singapore	0505	H
5.015	R.Vladivostok	USSR	0210	H
5.020	ORTN Niamey	Niger	2153	K,L
5.025	R.Rebelde Habana	Cuba	0030	U,Y
5.025	R.Uganda, Kampala	Uganda	1930	S
5.030	R.Los Andes	Peru	2120	L,P
5.035	Alma Ata	USSR	0210	H,L,T
5.035	R.Aparecida	Brazil	1954	J
5.035	R.Bangui	C.Africa	2130	C,F,K,Y
5.040	PBS Fujian	China	0225	H
5.040	V.del Upano	Ecuador	0007	P
5.040	Omdurman	Sudan	1731	D
5.040	R.Tbilisi	USSR	1946	D,L,T
5.045	R.Cultura do Para	Brazil	0100	Y
5.045	R.Togo Lome	Togo	2100	C,F,K,M,S,Y
5.050	Voz de Yopal	Columbia	0025	P
5.050	R.Tanzania	Tanzania	0540	H
5.055	RRI Nabire	Indonesia	2111	J
5.057	Gjirokaster	Albania	1951	H,L,M
5.060	PBS Xinjiang	China	2320	F,V
5.065	R.Candip	Zaire	0331	P
5.075	R.Beijing	China	2105	M
5.095	R.Sutatenza, Bogota	Colombia	2315	F,H,K,P,T,Y
5.275	WYFR	via Taiwan	1524	J
5.290	R.Krasnoyarsk	USSR	2254	K,T

# SEEN & HEARD

Bangladesh, Dhaka on 13.615 at 1400. Robert Taylor logged Radio Baghdad, Iraq on 13.650, beaming programmes in Spanish to S.W. Europe from 1800 until 1855 — he rated their signal as SIO 333.

The 11MHz (25m) band has a great deal to offer the DXer both during the day and at night. Some of the broadcasts noted in the early morning stem from Radio Australia via Shepparton, S.E. Australia 11.910 at 0625 (English to S. Pacific area 0400-0630); Radio HCJB Quito, Ecuador 11.925 at 0750 (English to Australia 0700-1130) — both logged by Bill Reid; KNLS Anchor Point, Alaska 11.860 (English to S.E. Asia 0800-0900), logged by Philip Rambaut at 0818; FEBC Manila, Philippines 11.850 (English/Czech to C. Asia 0830-1100) and WYFR via Okeechobee, Florida, USA — both noted by John Nash around 0840; TWR Guam, Pacific 11.805 (English to E. Asia 0835-0930) rated as 222 by Stephen Taylor at 0910.

The Voice of Israel, Jerusalem 11.585 (Hebrew to W. Europe 1100-1500); Radio Kuwait 11.990 (Arabic to Middle East 0615-2215); Radio Cairo, Egypt 12050 (Arabic to Europe 0700-2350) and Radio Damascus, Syria 12.085 (Arabic to Middle East 0600-1500) were all logged around 1330 by Leslie Biss. Radio Pakistan, Islamabad 11.615 (Urdu/English to N. Africa 1315-1630) was rated as 43444 by John Nash at 1534 and Radio Polonia, Warsaw 11.840 (English/French to W. Africa 1600-1700) was noted by Darran Taplin as 44433. An Extensive log from Philip Rambaut included BBC via Kranji, Singapore 11.750 at 1439 (English to Asia 0900-1615); VOA via Tinang, Philippines 11.965 at 1453 (Chinese to Asia 1000-1500) and VOA via Kavala, Greece 11.835 at 1600 (Hindi to Asia 1600-1700).

Some of the broadcasts noted during the evening include Radio Beijing, China 11.500 (German/English to Europe 1800-2155), noted by Ron Proudfoot in



◀ Fig. 1

Newcastle-upon-Tyne; AIR New Delhi, India 11.620 (English to Europe 1800-2230), rated as 43343 by John Nash at 1845; Radio Portugal, Lisbon 11.740 (German/English/French/Italian to S. Europe 1900-2100) and WCSN Boston, USA 11.695 (English to Europe 2100-2155) — both were logged by George Efstratiades. In Worcester, Edward Broadsmith has been listening to Radio RSA Johannesburg, S. Africa on 11.900 at 2100 (Portuguese/French/English to Europe 1900-2156). Bill Reid logged WRNO New Orleans, USA on 11.705 (English to N. America 2100-2230) and rated their signal as 323 and Jim Willett heard Radio Globo, Brazil on 11.805 at 2359 (Portuguese 0900-0300).

The 9MHz (31m) band offers plenty to interest DXers throughout the day and long distance reception is generally good. Keith Wakelin is one of the many regular listeners to the broadcasts to Europe from Radio Australia via Shepparton on 9.655 from 0700 until 1030 — he uses a DX302 receiver with a Global 1000 a.t.u. and 20m wire antenna in Hull and has found reception good. George Hewlett says peak reception conditions exist just now and their signal is generally SIO 444 from 0830 until 0915. Chris Arniotis says the

ABC domestic s.w. service from Perth on 9.610 has been reaching New York at SIO 454 at 1150.

Many of the stations detailed last month are still active during the day. In addition, George Morley picked up the Voice of Kampuchea, Phnom-Penh 9.695 at 1233 (SIO 132); FEBC Manila, Philippines on 9.800 at 1320 (333) and TWR Guam, Pacific 9.820 at 1410 (334). Tim Shirley heard the Voice of Vietnam, Hanoi 9.840 at 1313 (French/English to Europe 1300-1400) and at 1600 logged Abu Dubai on 9.630 (Arabic to Europe 1600-2130).

At night, some of the broadcasts from S. America are audible in the UK — Radio Bandeirant, Brazil 9.645 (Portuguese 0800-0300) was rated as 34443 at 2130 by Neil Dove; Radio Rumbos, Venezuela 9.660 (Spanish 0900-0600) was logged at 2215 by Stephen Taylor; Radio Nac. Paraguay 9.735 (Spanish/Guarani 2200-0200) was logged by David Glover at 2250 and RAE Buenos Aires, Argentina 9.690 (Portuguese/Spanish/English to S. America 2200-0500) was rated as 34432 at 0210 by Neil Dove.

Despite the overcrowding, signals have also been good on the 7MHz (41m) band. Two early morning religious broadcasts noted by DXers, stemmed from

WYFR via Okeechobee, Florida on 7.355 (Russian/German/English to Europe 0400-0745), rated as 44444 by John Nash at 0639 and also logged by Dick Moon in George, S. Africa and from TWR Monte Carlo, Monaco on 7.105 (English to Europe 0645-0840), rated as SIO 444 by Cryll Kallam at 0700.

Many interesting broadcasts were logged later in the day, including those from RBl via Nauen, GDR 7.295 (English to Europe 1515-1600), rated as 444 at 1550 by Peter Hall; Radio Australia via Carnarvon W. Australia 7.205 (English to Europe 1530-2040), logged by Stewart Russell; AIR New Delhi, India 7.410 (English to Europe 1845-2230), rated as 35543 by Neil Dove at 1957 and Radio Beijing, China 7.700 (Russian to Europe), rated as 44554 by John Parry at 2000.

Reception on the 6MHz (49m) band has also been good — Stewart Russell is a regular listener to Radio Australia via Carnarvon, W. Australia on 6.035 (English to Europe 1530-2040). Neil Dove heard Vatican Radio, Rome on 6.190 at 1950 — their broadcast to Europe from 1630 to 2100 is in 13 languages. Listening during the night, Bill Kelly logged King of Hope, S. Lebanon 6.280 at 0300.



Fig. 2 ▶

## RALLIES

**December 6:** The North Scotland Second Annual Computer and Electronics Show will be held in the Music Hall, Aberdeen. Admission is £1. The show is organised by SATRO North Scotland. SATRO (Science and Technology Regional Organisation) North Scotland is a non-profit making organisation, dedicated to supporting and enhancing science and technology education. Any profit from the show will be devoted to developing computer and electronics clubs.

Dr L. Glasser

Chemistry Department  
University of Aberdeen  
Aberdeen AB9 2UE  
Tel: (0224) 272952

★ SWM will be in attendance.

**\*December 6:** The Verulam Christmas Rally will be held at the St Albans City Hall. The rally is open from 11am to 5pm. There will be a bring and buy, raffle and a talk-in station.  
S.C.B. Dunning  
0923 52959

**March 13:** The Bury Radio Society will be holding their 1988 rally at a new venue. The bigger venue is the Castle Leisure Centre, Bolton Street, Bury. There will be the usual large number of stands, a bring and buy and

masses of radio and electronics traders. Talk in will be on S22.

M. L. Jamil G1VQE  
29 Harrow Close  
Blackford Bridge Bury

**March 20:** The Tiverton SW Radio Club are holding The Mid Devon Rally at the Pannier Market, Tiverton. There is easy access from junction 27 of the M5 and excellent parking facilities on site. There will be two halls of trade stands, a bring and buy and a mobile snack bar. Talk-in will be on S22.

G4TSW  
Mid Devon Rally  
PO Box 3  
Tiverton

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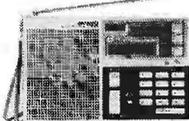
A major innovation in monitor receivers. Just think, a complete short wave and vhf monitoring system in your pocket! Memories, scanning, etc. Order today.



£329.00 Carriage Free.

### SONY ICF7600DS PORTABLE COMMUNICATIONS!

Not a toy, but a serious communications receiver. 150kHz-30MHz AM/SSB plus FM 76-108MHz. Digital readout, memories, clock and provision for external antenna. Listen to the DX at work! Mains or battery.



£169 FREE SECURICOR

### R537S AIR- BAND MONITOR 118-136MHz

This well known receiver is ideal for air-band monitoring. Pocket size and battery powered with whip antenna. Highly sensitive and used by many professionals.



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### ICOM R7000 VHF/UHF MONITOR COMPLETE COVERAGE TO 2GHz

The best VHF/UHF monitor on the market! 26-2000MHz and highly sensitive. It's not cheap but it really is a superb monitor for the serious user. Every possible facility you will ever need!



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### TRIO R2000 HF RECEIVER POPULAR BASE MONITOR

Well respected, it covers 150kHz-30MHz AM/SSB/CW plus memories, scanning, digital readout and optional VHF module 118-174MHz. Like all Trio equipment it has a super specification.



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### AOR 2002 SCANNER VHF/UHF MONITOR

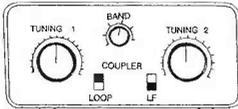
From AOR the famous VHF/UHF monitor that covers 26-1300MHz AM/FM. Highly compact. 230V or 12V DC with LCD, memories and scanning. Ideal for the serious user. A wide range of facilities and 230V AC or 12V DC.



£475 FREE SECURICOR

### GLOBAL AT1000 AERIAL TUNER

The AT1000 is a receiver aerial tuner designed to give you maximum performance from your receiver. Covering the frequency range 150kHz to 30MHz it matches all the modern receivers produced in recent years. Ideal for matching long wire, dipoles or balanced feeder.



£69.00 POST FREE

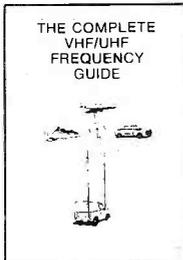
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PUBLISHED**

### THE SECRET OF LEARNING MORSE CODE By Mark Francis £4.95 + 90p p&p

Morse code is an essential requirement for those who aspire to a class "A" licence. But many other enthusiasts, including the thousands of listeners would improve the enjoyment of their hobby immeasurably if they were able to read Morse. This book sets out to take the myths and mysteries out of the subject. It takes you step by step through the whole process of learning the code and provides simple answers and solutions to all those familiar pitfalls so often encountered by students. Written in an easy to read style that will make your study enjoyable, it is packed with exercises, sample tests, etc., and runs to almost 100 pages. At last somebody has cracked the "secret" of learning Morse code quickly and easily.

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### COMPLETE VHF/UHF FREQUENCY GUIDE 26-2250MHz £4.95 + 80p p&p



This guide has sold over 4,000 copies since its publication last August and is still selling well. Mainly because it is recognised as being of tremendous value and unique in radio literature. If you are one of the many who are curious to know who transmits where, in the wide VHF/UHF spectrum, then this is a guide that you should not be without. This book gives comprehensive details of all the main users of this part of the radio spectrum. The frequency range is subdivided into sections under appropriate headings for the type of services using the particular sub-divisions. All kinds of service are covered including land, sea, air and space. Full details are included of duplex splits for bases and mobiles plus some useful editorial. If you are at all interested in this part of the radio spectrum, you will find this a most valuable and absorbing book.

### UK LISTENERS CONFIDENTIAL FREQUENCY LIST 1.6-30MHz £5.95 + 80p p&p



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**1987 EDITION** This famous listing is now in its fourth edition. Completely updated for 1987 and a lot thicker. Yet the price is the same as the 1986 edition! Many additional frequencies have been added and of course some have been deleted where the service is known to no longer exist. Packed full of information on all that happens between 1.6 and 30MHz, you will find this fascinating reading. Covering all aspects of the shortwave service, here is just a selection of the listings included: AVIATION, BROADCAST, MARINE, EMBASSY, MILITARY, RTTY, FAX, PRESS, and much more. Not only frequencies and stations, but in many cases times of transmissions as well. This is not an American import, but a UK printed manual specially for UK listeners. If you are one of the few people that haven't purchased one of these yet, then you really don't know what you have been missing. If on the other hand you have our previous editions, we know that you will want to get the latest edition. Order your copy today.

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Just published, this is the UK's foremost list of military and civil radio frequencies. Nearly three times as large as the 1986 edition and bang up-to-date. Every conceivable airfield is listed from the smallest grass field to the largest of our international airports. We have now included full airways listings plus helipads and off-shore rigs. In addition, there are listings of company frequencies, VOLMETS and miscellaneous air-to-air frequencies. Don't confuse this with other guides you may have seen. This one is REALLY comprehensive and packed with information. For the newcomer there is some interesting editorial plus photographs, and a very useful telephony designation list. Full colour semi-stiff covered in large format style makes this one of the best presented guides yet. Undoubtedly the best manual there is available to the enthusiast today. There is also a free up-date service to purchasers so you won't need to worry about the information becoming out of date. That's real service!

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# WATERS & STANTON

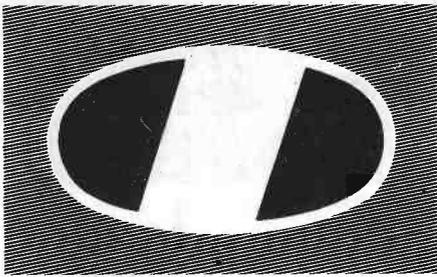
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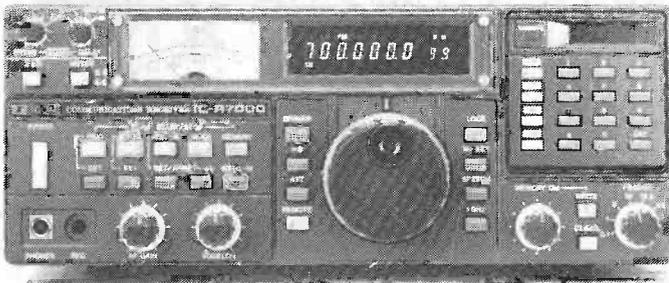
# ICOM

## Communications

### IC-R7000, 25-2000MHz.

### Commercial quality scanning receiver

ICOM introduces the IC-R7000, advanced technology, continuous coverage communications receiver. With 99 programmable memories the IC-R7000 covers aircraft, Marine, FM Broadcast, Amateur Radio, television and weather satellite bands. For simplified operation and quick tuning the IC-R7000 features direct keyboard entry. Precise frequencies can be selected by pushing the digit keys in sequence of the frequency or by turning the main tuning knob. FM wide/FM narrow/AM upper and lower SSB modes with six tuning speeds: 0.1, 1.0, 5, 10, 12.5, 25KHz. The IC-R7000 has 99 memories available to store your favourite frequencies including the operating mode. Memory channels can be called up by pressing the memory switch then rotating the memory channel knob, or by direct keyboard entry. A sophisticated scanning system provides instant access to the most used frequencies. By depressing the Auto M switch, the IC-R7000 automatically memorises frequencies that are in use whilst it is in the scan mode, this allows you to recall frequencies that were in use. The scanning speed is adjustable and the scanning system includes the memory selected frequency ranges or priority channels. All functions including the memory channel readout are clearly shown on a dual-colour fluorescent display. Other features include dial-lock, noise blanker, attenuator, display dimmer and S meter and optional RC-12 infra-red remote controller, voice synthesizer and HPI headphones.



### IC-R71E, General coverage receiver.



The ICOM IC-R71E 100KHz to 30MHz general coverage receiver features keyboard frequency entry and infra-red remote controller (optional) with 32 programmable memory channels, SSB, AM, RTTY, CW and optional FM. Twin VFO's scanning, selectable AGC, noise blanker, pass band tuning and a deep notch filter. With a direct entry keyboard frequencies can be selected by pushing the digit keys in sequence of frequency. The frequency is altered without changing the main tuning control.

Options include FM, voice synthesizer, RC-11 infra-red controller, CK70 DC adaptor for 12 volt operation, mobile mounting bracket, CW filters and a high stability crystal filter.

Telephone us free-of-charge on:  
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