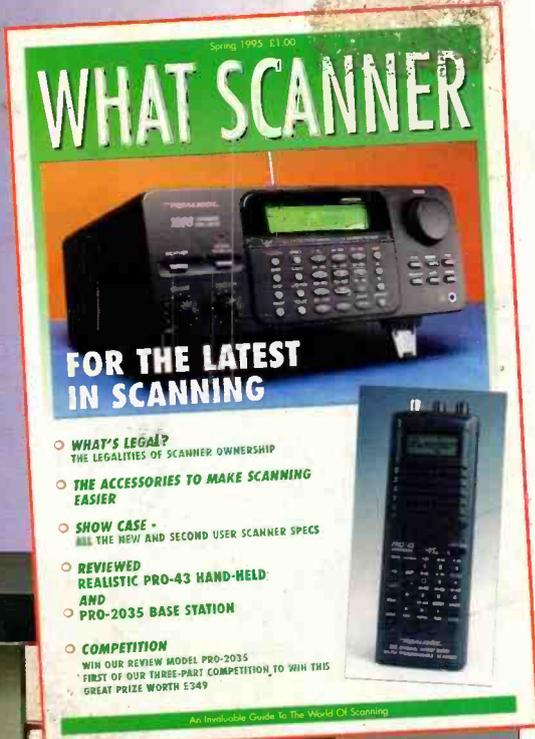


shortwave magazine

FOR THE RADIO LISTENER

FREE INSIDE WHAT SCANNER MAGAZINE

REVIEWS SPECIFICATIONS
COMPETITION



March 1995 £2.25 ISSN 0037 - 4261

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Cover Subject

What Scanner our free supplement is for the scanning enthusiast. It includes and invaluable guide to all the currently available scanning receivers. The MFJ 2 Metre kit is built and reviewed by Editor Dick Ganderton G8V FH.



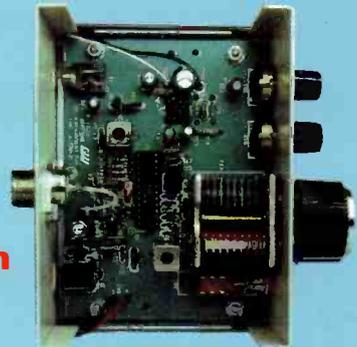
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The Publishers of *Short Wave Magazine* wish to point out that it is the responsibility of readers to ascertain the legality or otherwise of items offered for sale by advertisers in this magazine.

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SWM SERVICES

Subscriptions

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

Components for SWM Projects

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

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

Photocopies and Back Issues

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

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

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Technical Help

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

editorial



Dick Ganderton
G8VFH

This issue sees the publication of our popular annual *What Scanner* magazine. You will find this pull-out 24-page magazine in the centre of this issue. SRP Trading, who supplied the Realistic PRO-2035 featured in the review in *What Scanner*, have kindly agreed to donate the actual review receiver as the prize in a three-part competition. Our similar competition for the Lowe Europa receiver was extremely popular - I expect this to follow the same trend. The first part is in *What Scanner*, parts 2 & 3 will follow in the April and May issues of *Short Wave Magazine*.

CBer Makes President

This year the RSGB made history by installing as its President a radio amateur who unashamedly joined its ranks as a result of an interest in CB! Clive Trotman GW4YKL, the popular Welshman, was installed as President at a Bridgend hotel early in January. His installation was notable for its friendliness and the fact that Clive's CB past was openly referred to - but then, this was only to be expected of Clive. Rumour also has it that the Presidential Chain of Office, which carries the names of all the previous Presidents, had to be redesigned to prevent it tripping him up!

Clive is also the first true Welshman to hold this high office - the previous Presidents with GW callsigns not being born there.

In recent years the RSGB has had several 'members' Presidents' - Clive, with his great interest in the Novice and newcomer to the hobby, will undoubtedly be another of these. I look forward to his year of office - I'm sure that it will be a notable one.

Dick Ganderton G8VFH

letters

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

Dear Sir

Many thanks for publishing my letter in your January issue regarding the problems I was encountering finding software to connect up my Amiga computer to allow the output from an ERA Microreader to be saved to disk, etc.

It brought a response from Mr Prestow of Priory Software in Hungerford who was not only able to supply me with exactly the type of program I was looking for but had the added bonus of having a synoptic weather decoder package in his list of software as well. Both packages are extremely easy to use, very user friendly and very reasonably priced at under £10 each.

I enclose the address of Priory Software (7 The Priory, 137 Priory Road, Hungerford, Berks RG17 0AP) in the hope that if this letter is published, it may help other readers of your magazine who own Amigas to find suitable software to enhance their hobby as I did from Mr Prestow's list of software.

So, many thanks to you and many thanks to a very helpful Mr Prestow.

**I. M. Knox
Fareham
Hants**

Pleased to have helped. We always seem to get a very good response to readers requests for help - so don't forget if you're having trouble tracking down something obscure, or look for old information, or what ever. Just as long as it's related to radio and listening then just send a request to SWM for publication, it is very likely that you will get a result.

Dear Sir

From time to time you publish letters from readers who have received particularly good service from a SWM advertiser, and I would appreciate it if you would allow me to sing the praises of AOR (UK) Ltd.

I recently returned my AR3000 to them for servicing, the fault being caused by a mishap to me external analogue 'S' meter, which damaged the a.g.c. circuitry of the receiver.

Not only was the repair effected very quickly, but the charge for doing so was most reasonable, and the receiver was returned complete with a typed letter explaining what damage had been occurred, and listing all the components that had been replaced. The faulty items were returned in a small envelope.

I would like to thank Richard Hillier for his helpful advice over the last few years, and also Andrew Allen, the engineer, for his speedy repair. Not only are their receivers works of art, but the back-up provided is second to none

**Peter Rycraft
Wickham Market
Suffolk**

Are you happy with you're Radio Dealer? Tell us about you experiences you could pick up a £5 voucher if we publish your letter.

Dear Sir

I wish to convey a heartfelt thanks to Subscription Services Ltd. and to Jason Pearce in particular for their recent help.

I shall be flying out to Romania for Easter week to initiate the training of teacher-carers of children who have learning and physical disabilities. This will be a long term project with the education and eventual integration of these children (nursery age to young adults) into society at large. My husband Robin will be driving a truck in convey for the Biggin Hill Romania Relief group.

If I have the time and working conditions are favourable, I should like to transmit back from my base - an area west of Bacau, eastern Transylvania. I am trying to overcome problems both technical and non-technical, not least the realisation that my licence would need renewing. I envisaged a miracle was needed if I was to beat this particular deadline on which other deadlines depended.

Subscription Services Ltd. at the Radio Licensing Centre came to the rescue. On the Monday, Jason Pearce listened courteously to my problem. On the Tuesday, he received written confirmation of my trip and cheque. On the Saturday my new licence arrived.

This was an exceptional case, I know, but keep up the good work Subscription Services, and may your efficiency on this occasion pervade your execution of other licence renewals for radio amateurs nationwide.

I should like to hear from anyone who is interested in hearing more about my fact-finding mission and its consequences, anyone who has transmitted from Romania or who has contacts near where I am going. An s.a.e. would be appreciated.

Gloria Ackerley G3VUN, QTHR
Secretary of Medway Amateur Receiving & Transmitting Society

We seem to hear a fair mix of opinions regarding the performance of SSL. Having just passed my RAE, and being very keen to obtain my licence I was very pleased with the fast turnaround of my licence - two week inclusive from posting the application form to receiving the validation document! Not bad when you consider that with the publication of the RAE results things must hit quite a peak. - KN

Dear Sir

How my heart goes out to Mr C. Goodall, January SWM, in his trials and tribulations whilst attending rallies, the length and breadth of our (fair?) land! - Poor chap!

Might I therefore be allowed to rush his aid via this page of your magazine and offer the following solution?

1) That Mr Goodall purchase a pair of green wellies to cope with the unthoughtful/uncaring habit of the Lord Bath's delinquent sheep, (absolute rotters, the lot of them!)

2) That he pack his own lunchbox in future whilst attending Picketts Lock (cucumbers and pickle masticate well in the vertical/mobile position).

3) That he campaign for a replica of IKB's railway station to be built in Granby Halls - along the lines (broad gauge) which your fine self suggested.

Should all this of course

not be to Mr Goodall's liking, then, as a last resort, he might consider the following:

That approaches be made to the Dean of Salisbury Cathedral to transfer the Longleat Rally to the environs of that esteemed building.

Here he will find only Plastics sheep (some 12-15 in all), and should he wish, an unsurpassed ambience. At the 4.30pm evensongs service with the Dean and those other worthy and religious souls of Salisbury. (Mr E. R. Billiards of Nottingham is welcome to join him).

He would of course be well advised to bring his Datong MkII insect filter along to the service, as Scarlatti's *Aria in G* needs a bit of tidying up on the imitative counterpoint side.

T. B. Ellard
Chippenham
Wiltshire

Dear Sir

Thank you sending us a copy of the letter you have received from Matthew King, a *Short Wave Magazine* reader, who seeks clarification on the law relating to listening to unlicensed broadcasting stations and the use of radio scanners.

It is not the Agency's policy to comment on individual cases which have been before the Courts. However, the position under the Wireless Telegraphy Act 1949 (the 1949 Act) is as follows.

Radio receivers used solely for the reception of authorised broadcasting stations were first exempted from licensing on 1 April 1971. The exemption did not however extend to radio receivers used to receive unauthorised broadcasting stations.

On 27 February 1989 the use of all radio receiving equipment was exempted from licensing with the exception of television receivers and receivers used for the purpose of receiving unauthorised broadcasting stations. It has therefore always been the case that it is an offence to receive unlicensed broadcasting stations other than under the authority of a licence. Such licences are not issued.

In addition to the licensing aspect, members of the public may only lawfully use radio scanners to listen to radio messages sent for general reception or radio messages that the sender has given permission to be received. Messages for

general reception include, among other things, transmissions by authorised broadcasters, radio amateurs and Citizens' Band radio operators.

The unauthorised reception of other radio communications is an offence under section 5(b) of the 1949 Act. On conviction the maximum penalty is a fine of £5000 and forfeiture of the apparatus. The law relating to the use of radio scanners is fully explained in the Agency's Information Sheet RA 169, which can be obtained by telephoning the Agency's enquiry point: 0171-215 2150.

I am enclosing a copy of RA 169 for your information. You are welcome to publish the information sheet and the above paragraphs.

On a separate issue, the feature article by Peter Dowling on the Network-Q RAC Rally published in the November 1994 edition of *Short Wave Magazine* has been brought to the Agency's attention. I am surprised that the article carried such direct encouragement to people to listen to the private radio communications of those involved with the Rally.

As mentioned above, such activity constitutes an offence under the 1949 Act. I would have therefore thought the article should have been balanced by at least reminding readers of this fact. Publication of the Agency's response to Mr King will of course now achieve this.

D. S. J. German
Radiocommunications
Agency

Dear Sir

I have been trying to find where I could purchase a Vega Selena radio for some time now. Many different shops and companies have been tried, but I've drew a blank every time. I was wondering whether you might know of any stockists where I may be able to obtain one.

I've even gone to the extremes of writing to the Russian Embassy in London, but unfortunately, had no reply. It has intrigued me further, and I am determined to buy one eventually.

They say that good things are hard to come by, and this is proving true. I hope you can help me in this matter, my fingers are crossed.

R. Wilson, Middlesbrough
Cleveland

OK, who can help here then?

letters

Dear Sir

In response to Mr Evans' (February *SWM*) opinion regarding Michael Cannon's book *Eavesdropping on the British Military*. I thought he was too hasty and unfair in slating it the way he did. This book is not meant to be a 'mere' frequency list, as he seems to think, but more of a manual on the limited subject of monitoring the British Military Forces communications.

I purchased my copy of this publication last December and found that in spite of the odd, one or two 'stale' airband frequencies, the information held within it covers more than compensated for this minor discrepancy.

Indeed, this book set out to explain various systems of communication and the procedures as used by the British Forces, including detailed lists of callsigns, tables and graphs. It also demonstrated various examples of interpreting the transmitted signals. This book is a 'gold mine', because most

of the information in it is still classified.

Considering that Britain has the dubious reputation for being the most 'secretive' nation in the world, Michael Cannon should be congratulated for risking prosecution by presenting this information.

If I need an up-to-date frequency, I tend to consult the latest frequency lists, such as the ones regularly produced by Javiation or alternatively the latest *RAF En Route Supplement*. Or in Mr Evans' case *Airwaves 94*, which in my opinion isn't quite the Bees Knees what he seems to think it is.

In fact, a friend of mine purchased a copy of 'Airwaves 94' last May, during the 'Fighter Meet' which was stages at North Weald Airdrome, and guess what? North Weald wasn't listed in it!

**Mark Lewis
Widnes
Cheshire**

Isn't personal opinion a wonderful thing?

Dear Sir

The correspondence in the January '95 issue of *Short Wave Magazine* regarding the MVT-7100 in particular and h.f. reception on scanners in general, coincides with some experiments we have been carrying out here to find ways of improving the short wave reception on scanners and so offer our customers a more attractive package.

The reception of h.f. was originally added to scanners because it was easy to do and because it added that 'extra feature' that all manufacturers the world over look for in order to justify a new model. Your correspondents have rightly identified the problems that arise when scanners are used for listening to frequencies below 30MHz.

Using the whip supplied for short wave reception on a scanner is akin to using a 600mm long piece of wire in the back of a conventional short wave receiver! Hardly a workable set-up. However, put a 20m wire on the scanner and all you will hear is a wall of noise that pins the l.c.d. hard over.

It's a great shame, therefore, though hardly surprising, that the majority of owners quickly lose interest in the h.f. coverage on their scanners, regarding it as something of a gimmick. Yet the latest models have all the ingredients for worthwhile short wave reception from the mixer onwards. Our solution is simple and relatively cheap and we now have the system on demonstration at our Hockley showroom.

We erected a 20m wire (because gardens seem to average that length these days) and terminated it in one of our Watson long wire baluns. From this we took a shielded coaxial cable down into the 'shack'. This wire was then terminated in one of the new Global AT2000 a.t.u.s which has a Q switch to increase the front-end selectivity.

With this system we can operate any of the modern scanners on the h.f. bands and produce a quality of reception that matches many base station receivers. The difference is miraculous. Even we were surprised, and it takes

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

Dear Sir

Mr Walker's experiences of the Yupiteru MVT7100 (*SWM* December 1994) should have caused him no surprise. These hand-held scanners suffer from three major defects.

- 1) Wide open front-ends
- 2) Poor and noisy synthesisers
- 3) Relatively cheap and cheerful construction

Recently I needed a v.h.f. and u.h.f. general coverage receiver and was lucky to be able to locate a second-hand professional receiver for a little more than the price of a reasonable hand-held scanner.

It was the SR-209 made by Norlin Communications Inc of Gaithesburg, Maryland, USA. I don't suppose too many of your readers will be familiar with that manufacturer, but then, are they familiar with the similar products of Watkins-Johnson, REGGCO, Siemens or the like?

The Electronic Warfare section of *Jane's Weapons Systems* is a true gold mine of information for the technically curious to drool over. Suffice it to say that my SR-209 incorporates:

- 1) Four separate plug-in tuners to cover the range 30 to 1000MHz, further plug-ins extend the range to 12GHz!
- 2) A c.r.t. spectrum display
- 3) Superb pre-mixer selectivity comprising four permeably tuned circuits gives an image rejection of 80dB at 500MHz
- 4) Film strip scale
- 5) Solid construction including silver-plated screens, p.t.f.e. wiring and gold-plated connectors.

Of course there are disadvantages. All that front-end selectivity requires an old fashioned tuning knob, so it won't scan. The synthesised v.h.f./u.h.f. professional receivers, such as the Racal RA 1795 have tracking pre-selectors, but don't even think of the prices!

It's also quite large and deep and weighs around 30lb. For me, at home, size is unimportant and it is wonderful to be able to use equipment in superb condition that one must have cost NASA, the CAA or some other Government Department many thousands of dollars.

**M. O'Beirne G8MOB
Long Ditton
Surrey**

As you say, there is much value for money to be had with this kind of surplus product, in the '50s much war surplus equipment had enthusiasts extolling the virtues of ownership. However - try putting the SR-209 in your pocket!

a lot to do that these days! We also tried the MFJ-956 passive pre-selector which works almost as well.

Many scanner owners probably fail to realise that they are potentially in possession of a very good short wave receiver. It just needs a couple of relatively simple additions to fully unlock the true capabilities of their receivers.

**Peter Waters
Waters & Stanton**

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

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

junior listener

One of the most frequently asked questions I receive is, "which radio is best, which one should I buy?". The trouble is there is no magic answer. There isn't a radio that is better than any other, because different radios suit different people.

If you've decided to buy a radio, whether new or second-hand, what do you look for and what questions should you ask your self before you finally part with your money?

Well, I think that the first question to ask yourself is 'how much am I going to spend?'. Obviously, if you have a budget of, say, £150 then you have to decide are you wanting a brand new radio or a second-hand one. Many dealers have a wide range of second-hand sets available and you have the security of buying from a reliable, known source. I'm sure that the advert's you see in *Trading Post* are quite genuine, but why is it the set of your dreams is always on the other side of the country? Once you've set your price, this gives you a good idea of the radios in the price bracket. If you're buying new, contact the advertisers who sell the radios on your list and ask for brochures. Now you are armed with the facts.

The next question to ask yourself is, "what do I want the radio to do?" Are you only interested in local radio and medium wave or is short wave broadcast your main interest? By looking through the brochures you can get a good idea of which set has the best features in your main interest. You can also read other peoples evaluations in such publications as *WRTH Equipment Handbook*, *Passport to World Band Radio*, *WRTH* and, of course, *Short Wave Magazine*. You may be lucky and find that your local

library stocks the first book, which is helpful. Read as much as you can about the radios on your list. Have a look at the list of equipment used by the readers of 'LM&S', this can give you a good idea of the radios that these people find useful.

Next thing to think about is how complicated do you want it to be. Are you happy with lots of little buttons, do you want all the latest features? You don't need an all singing, all dancing radio to get results, check you the results in *LM&S* from some of the people using the 'simpler' radios. Also think about whether you want things like notch filters, b.f.o.s, noise blankers and the like. The you can go through the brochures you've got and narrow your choices down a little.

If it is at all possible, try and either get to a rally or to one of the advertisers with a large showroom, this way you can have a 'play' with a few different radios. You can't beat the 'hands-on' test. A radio that sounded brilliant in the brochure may turn out to be not for you when you try it as perhaps you can't read the writing on the front panel for example.

Short Wave Magazine is an excellent source of information as to what other people are using and the results they are achieving. Time taken reading before you make the decision will be well worth it in the end.

Finally, the choice is down to you, you are going to be the person using the radio - not me or any one else who passes on advice. The best advice I can give, is collect together as much information from as many different people as you can, try and get a look at as many sets as you can and then make **your** choice. Happy listening.

Liberation of Guernsey

In the Winter edition of *Datacom* (the journal of the British Amateur Radio Teledata Group - BARTG) is an interesting piece about the 50th Anniversary of the Liberation of Guernsey. On Tuesday May 9, the Guernsey Amateur Radio Society is to run a special event station from Castle Cornet in St. Peter Port, Guernsey. The station will run from Sunday May 7 until Saturday May 13, with full 24-hour operation on Liberation Day, Tuesday May 9.

They are hoping to run on all h.f. bands, 160m to 10m, with s.s.b., c.w. and RTTY. A QRP station will also run for periods during the week. They will also be running packet on the 144MHz band and 430MHz s.s.b. Apparently, satellite working is also a strong possibility!

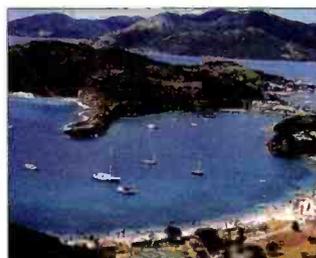
Another station for all beginners to keep a listen out for. With so many bands being worked you should be able to find this group.

Many thanks to *Datacom* for the information.

Another Anniversary

The Radio Society of Bermuda will be putting on a special event station to commemorate the 200th anniversary of the opening of the Royal Naval Dockyard on Bermuda. There will also be a yacht race from Nelson's Dockyard, Antigua to Bermuda to commemorate the occasion.

The Radio Society of Bermuda will operate VP9RND from 1300 on Saturday May 20 until 2100 on Sunday May 21.



English Harbour and Nelson's Dockyard, Antigua. Photo: Peggy Ganderton.

My Radio

I've had an interesting letter from **John Court**, he thought I'd be interested to hear how he's getting on with his radio. He's got a SoundLab ST912 12-band short wave radio that cost £19.95. It covers 6-26MHz and he thinks has a solid feel to it, is well made and he finds no images or unwanted frequencies when he's using it. Using the whip antenna he's heard Radio Australia at 1100UTC at SINPO 54555, Radio New Zealand at 0900UTC at 33333, Radio Japan at 0700 at 4444 and Radio Mexico at 0030 at 33323. Thanks, John for the report.

If any other beginners would like to tell me how well they're getting on with their radio, drop me a line, as usual to the address at the head of the column.

Novice & Beginners Corner

I've heard from the Yeovil Amateur Radio Club regarding their popular QRP Convention. This year, the date will be Sunday May 21. They are going to have a Novice and Beginners Corner where they'll have things like details on how to become a Novice, the sort of things you'll have to do as a Novice and someone to answer questions from newcomers.

The Convention also includes the usual formal talks on amateur radio topics, displays of equipment, a construction challenge and traders.

If you would like more details of the Convention, contact George Davis G3ICO, Broadview, East Lane, Mudford, Yeovil, Somerset BA21 5SP.

VE Day

With VE celebrations being planned I'm sure there will be lots of groups like the Radio Club of Thanet who are putting on special event station. GB5VE will be on the air during May to commemorate VE Day with special emphasis and all-day operation on May 6, 7 and 8. They hope to operate from Richnorough Power Station near Ramsgate as they did for GB5DD last June. The QSL Manager will be Buster G3OPL and I'm sure that he'll have his work cut out for this one. Keep a listen out for them.

Join the Lowe Information Superhighway!

For all those Lowe receiver users with access to the Internet, you may like to know that there is a mail list exclusively devoted to this subject. It is completely unconnected with Lowe Electronics, being run by a group of short wave enthusiasts in California. It does however carry lots of useful information, reviews, modification details and general help to enable you to get the best out of your receiver. Subscription is completely free, and it is open to anybody who is interested - you don't have to own a Lowe receiver to join!

If you want to subscribe, just Email Lowe Electronics at info@lowe.demon.co.uk and they will tell you how to join.

Project Jason

As an update to last month's piece the Jason Project has announced a change to frequencies and times of operation. Correct details are now as follows:

GB0JAS/GB6JAS at British Geological Survey, Nottingham
Location: HQ of British Geological Survey, at Keyworth Notts.
QRA IO92 WAB/UK National Grid Square SK64 Lat/Long 52°53'N 01°04'W

Organised by: Loughborough & Dist ARC, ARC Nottingham, Hucknall Rolls Royce ARC, GPT Comms ARC, Melton Mowbray ARS, South Notts ARC, Erewash Valley ARG, South Derbyshire & Ashby Woodlands ARG, and others too numerous to mention.

Dates: 5-11 March (public days are 6-11)

Times: 1300-2230 UTC daily. Some morning operations (0900-1300UTC) on Sunday 5 March and Saturday 11 March.

Frequencies: GB0JAS 3.77, 7.07, 14.27, 21.27MHz all s.s.b. or c.w. as appropriate and 28.47MHz if conditions allow.

GB6JAS 51.23, 144.23MHz s.s.b. 51.55, 145.55 and 433.55MHz f.m.

Additional Displays: Live weather images from NOAA/Meteost etc. by Remote Imaging Group, STELLAR & RSGB.

Contact: Alan Clayton, G&HZZ, (0115) 9363253 - day or (0115) 9212857 - evening, or the chairmen of the participating clubs.

GB2JAS at Merseyside Maritime Museum, Liverpool

Location: Merseyside Maritime Museum at Albert Dock on Liverpool's waterfront.

QRA IO83 WAB/UK National Grid Square SJ83 Lat/Long 52°25'N 03°00'W

Organised by: Liverpool and District Amateur Radio Society and friends.

Dates: 27 Feb - 11 March (excl 5 March)

Times: 1700 UTC onwards, earlier if possible.

Frequencies: close to those for GB0JAS. 6m may not be used.

Contact: Jim Anderson G0TDK, 104 Mablane, West Derby, Liverpool, L12 6RL.

Eddystone Shines On

We often receive letters and 'phone calls from owners of vintage radio sets, looking for help with a new acquisition or a trusty old friend that's a bit sick. One recent call made to the Editorial Offices was a request regarding an Eddystone EC10 (*nice set, too - Ass. Ed.*) and this reminded us of the Eddystone User Group. The Group operates from the Eddystone factory and publish a bi-monthly news letter, which is packed full of articles covering the use and maintenance of all of the Eddystone mark. We also recently received a letter from Ted Moore of the Group reminding us that they have a very active membership and provide their membership with unlimited technical help regarding their Eddystone receivers. They have access to

LynchLine

Martin Lynch has just announced the launch of the 'LynchLine', an on-line, 24 hours seven days a week BBS for providing information about new, used receiving and amateur

equipment and accessories. As the system matures, it is envisaged that the system will also feature special offers and 'reviews'. The system is available on 0181-566 0000, port speed of 2400 to 28800 baud, 8,1,n. If you require more information, then call, **The Radio Exchange Centre (voice) Tel: 0181-566 1120.**



manuals and circuits diagrams for models from the 1920s to present the day. The group has the full backing of the Eddystone Radio Ltd. even to the extent that the Managing Director, Chris Pettit will be at the National Vintage Communications Fair next May to promote the Uses Group.

For more information contact: **Eddystone User Group, c/o Eddystone Radio Ltd. Avlechurh Road, West Heath, Birmingham B31 3PP.**

RAE passes at PWP

Congratulations go to two of the editorial staff this month. Our Assistant Editor, Kevin and Donna Vincent from our sister magazine *Practical Wireless*, took the RAE in December and passed. They have adjacent B class callsigns, Donna - G7TZB and Kevin - G7TZC. Both have said they intend to work hard to get their Morse up to standard so that they can get their 'A' ticket! Well done both, good effort and keep bashing that key - *di dah di dah dit.*

£50 Book Draw

We are very pleased to announce the winner of this month's prize, £50 goes to the lucky *Book Service* customer, G. H. Huxley of Hants, who spent £26.90 on books. Not bad, eh? Free books and £23.10 left over. Who knows, next time it could be you!



National Radio & TV

Just one update to the national network this month.

Television Relay Stations

January 25 Allenheads, Northumberland a new relay station opened provided jointly by the BBC and the ITC. The station is located on a 17m mast near Kiln House, to the Northwest of Allenheads. It is designed to bring good television, teletext and NICAM stereo sound reception to around 260 people in the East Allen Dale, from Allenheads in the south through Dirt Pot and Spartlea to around Sipton Shield in the North.

Viewers who live outside these areas and currently use the Catton Beacon relay transmitter should **not** attempt to retune to the new relay.

Station Details

Channels:	
BBC 1 (North)	21
BBC 2	27
ITV (Tyne Tees)	31
Channel 4	24
Antenna Group:	A
Polarisation:	Vertical
Effective Radiated Power:	8W

Reception advice is available from either:

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

or

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

Prize Winners

Staying with a congratulatory theme, we are pleased to announce winners to two recent competitions. We received lots of entries to both competitions, in fact an overwhelming response.

First the winner of the **Lowe HF-225 Europa** is Mr M. Wooton of Staffs. Mike will be presented with his prize at Lowe Electronics headquarters in Matlock, see next month for photos. The two runners up are,

M. Casey, Manchester, and G. Singh, Berkshire they both win a years subscription to *SWM*. The Winners of the Five **Haydon Scanning**

Antennas are as follows;

S. Robertson, Essex
A. Edwards, Somerset
H. Thomson, Falkirk
S. Gildersleve, Essex
P. Smith, New Zealand

Well done to every one you will soon be receiving the antennas that you indicated on your entry form.

If you entered and were not lucky enough to win, don't worry. There will be more opportunities to win during this year. The first of these is in the free *What Scanner* supplement with this issue, where you can win a Realistic PRO-2035 base station scanner.

Internet

You may have noticed the increasing use of Internet addresses, in this magazine - for that matter you have probably noticed the ever increasing number of Internet related magazines on the magazine stands. There is no doubt aside from the hype, that the global access to electronic mail facilities and more can be a useful thing, *SWM* will have an address by the next issue. Watch these pages for details. In the meantime, however, we are currently accepting letters and contributions, via Kevin's address which is as follows kevin@brs95787.demon.co.uk, so if you want to beat the old fashioned post, feel free to Email us.

Radio and TVDX News

The definitive list of ALL TV transmitters in the European Broadcasting Region (which includes North Africa and the 'nearer' Middle East - 40 East and South to 30N latitude) is published by the European Broadcasting Union (EBU), Case Postale 67, CH-1218 Grand-Saconnex GE, Switzerland. Subscription to List no. 39 of TV Broadcasting Stations in the European Area which details the situation as of September 1, 1994 has just been invited. The list resembles a large telephone directory and includes transmitters from megawatts to milliwatts with two x 6 monthly updates throughout the year. Cost is 70 Swiss Francs including postage. For the first time ever, the list is available on a 1.44Mb 3.5" diskette for IBM PC DOS at the same price, a users guide costs another 15 Francs. Lists are also available for l.f./m.f. and for v.h.f. f.m. transmitters.

For the record, the 16:9 test card recently illustrated in this section in use by Belgium is called the Philips PM5644/85 designed for PAL-PLUS operations and compatible for conventional PAL 4:3 formats.

NICAM stereo update for France, Short Wave Magazine, March 1995

France 2 went into NICAM on the ch.E22 Paris Eiffel Tower transmitter December 22. TF1 is now adopting NICAM and an update on progress can be found on their teletext pages 260, 261. At this time - January - the following transmitters of the TF1 are stereo...Paris/Eiffel ch.L25; Lille/Bouvigny L27; Toulouse/Pic du Midi L27; Rouen L23; Lyon/Mt. Pilat L46; Clermont L22; Nantes L23; Bourges Neuvy L23; Tours L65. Up to November 1995 the following will NICAM - March - Marseille L23; Saint Raphael L25; April - Chartres L55; Niort L28; June - Le Mans L24; Dyon L59; August - Bordeaux L63; Rennes L39; Montpellier L56; Aies L27; November - Brest L27; Caen L22. These are main transmitters, numerous slave relays are also upgraded.

Czech Republic - The popular TV Nova is to introduce a 2nd channel called 'Supernova' and via the Liberec transmitter TV Premiera is now on air. Meanwhile in Slovenia TV stations operating in the OIRT VHF TV band have moved to UHF - Namestovo ch.R4 now to R26; Bardejov ex R4 now to ch.R40 and Kralova Hora ex R5 now to ch.R47. In Moscow the ch.R3 outlet on the Ostankino tower now radiates at 50kW erp the Telekanal 2x2 independent station 0600-1800; TV-

Contest Contest Contest

The EA RTTY contest organised by the Union de Radioaficionados Espanoles (URE) was created to promote activity in the RTTY mode and is open to Radio Amateurs world-wide. Advised rules are as follows:

The contest takes place on the weekend of 1/2 April 1995. commencing 1600 Saturday and finishing 1600 Sunday (times UTC).

Bands: 10, 15, 20, 40 and 80 metres, as per IARU band plans.

The contest and awards are split into four classes i.e. A) Single Operator all bands, B) Single operator single band, C) Multi-operator all band only, D) s.w.l.s.

Call: 'CQ EA TEST'

Message: RST and CQ Zone.

EA stations sent RST, 'PREFIJO PROVINCIAL' and CQ ZONE. Contacts between stations world wide are valid. It is not necessary to contact EA stations.

The Spanish 'Prefijos Provinciales' are: A, AB, AL, AV, B, BA, BI, BU, C, CA, CC, CE, CO, CR, CS, CU, GC, GE, GR, GU, H, HU, J, L, LE, LO, LU, M, MA, ML, MU, NA, O, OR, P, PM, PO, S, SA, SE, SG, SO, SS, T, TE, TF, TO, V, VA, VI, Z, ZA.

Points: 10, 15 and 20m bands, one for contacts within own continent, two for contacts outside own continent. On 40 and 80m bands, three for contacts within own continent, six for contacts outside own continent. Contacts between stations in the same DXCC country are valid for multiplier credits, but have zero points value.

Multipliers: CQ Zones and Spanish Provinces ('PREFIJO PROVINCIAL') on each band.

Final Score: total points in all bands times total multipliers in all bands.

Trophies: Award and plate to winner an class A. Award to winners in class B, C, and D.

Logs: Use separate log sheet for each band. Include a summary sheet showing scoring and other essential information. Official log forms are recommended. Mailing deadline for all entries is 15 May 1995. Entries to: **EA Contest Manager, Antonio Alcolado EA1MV, PO Box 240, 09400 Aranda de Duero, Burgos, Spain.**

Moskva 1800-2300; Telekanal 2x2 2300-0200 local time.

Gibraltar's GBC have committed a 2nd channel which will exclusively radiate the 24 hour entertainment channel 'BBC Prime' on a scrambled/subscription basis. Acting as agents for the BBC, the GBC would enjoy financial gain both from the sale of decoders and the commission on subscription fees. The GBC could 'sell the service successfully to ex-pats living up the coast' (the Costa del Sol) as comments the Gibraltar Chronicle. The new transmitter network would cost £850,000 to install - as yet no firm date has been given for commencement of the project.

In November over £100,000 worth of phone calls were made via private

exchanges by phone hackers. One Slough based supplier of datacomms and networking gear has 10,000 calls logged via their switching system to overseas between November 20 and December 2, mainly to Asia, Europe and North America. Hackers enter the phone system via 0800 numbers and route into voice mail systems - hacks can then sell black market calls via Orange PCN cellphones. Several firms ran up bills at +£20,000 and preventing the sophisticated and organised hacking is proving difficult! Technocom can offer a program for outgoing call monitoring - call them on (01753) 538415 ONLY if you work for a large company likely to experience this problem.

LISTENING TO

The NRD-535 With A Subtle Difference

The NRD-535 is a fine receiver, and fully confirms the JRC leadership in this particular field. However, even the best can be improved in specific areas; and after lengthy evaluation of the NRD-535 we decided that there were worthwhile improvements which we at Lowe, with our knowledge and specialist expertise, could introduce to the more discerning listener - for it is the true 'listener' who will appreciate what we have done.

First we thought that the audio from the NRD-535 was not totally easy on the ear, and detailed investigation showed that the audio response had been 'tailored' to suit the rather round shouldered response of the IF filtering. So, we went back to the IF filters and specified a higher performance SSB crystal filter with a 6dB bandwidth of 2.4kHz and a typical shape factor of 1.8:1; with less than 1dB passband ripple. For AM, we fit a more expensive filter with a 6dB passband of 5.7kHz and a shape factor of 1.5:1. The response of these new filters is very flat within the passband, with steep symmetrical sides giving excellent adjacent channel rejection. The use of these more expensive filters allowed us to flatten the audio response of the receiver giving a much clearer sound quality and a real improvement in intelligibility both on communications and broadcast stations.

We have noticed in the past that the audio output power from most modern receivers is barely adequate for driving a good loudspeaker, and since we now had top quality audio from the NRD-535, we designed and fitted a completely new audio power amplifier with enough power (3W at 5% distortion) to enable the user to sit back and enjoy that quality to the full.

The use of synchronous AM demodulation and/or ECSS is an established feature of many newer receivers, and fitting the optional CMF-78 ECSS board to the NRD-535 provides the user with the potential to recover good audio from signals which are subject to selective fading.

However, we noticed a tendency for the ECSS to unlock during deep fades and then fail to re-lock after the fade. We now have a series of detailed modifications to the ECSS unit which removes this tendency and also improves the recovered audio.

The Lowe Electronics modification pack definitely makes a good receiver into an outstanding receiver. When we sent a sample of our modified NRD-535 to Jonathan Marks at Radio Nederland, he confirmed that the results were quite remarkable and said so in no uncertain terms. We think that you will agree.

Naturally, these modifications cost a little more, but to complete the whole package we also pre-age the master reference oscillator in the receiver, check out the alignment and issue an individual test certificate with each one. And because we are proud of our work we add a discreet badge to the front panel to tell you that you own a receiver with a difference.

The 'Lowe' NRD-535. We make a good receiver into an outstanding receiver.

- New high specification IF crystal filter for SSB
- New high specification IF filter for AM
- New calculated audio bandwidth 'flattening'
- New higher power audio output system
- New tighter specification ECSS system
- Pre-ageing and 'burn-in' of master oscillator
- Individual test certificate for each receiver



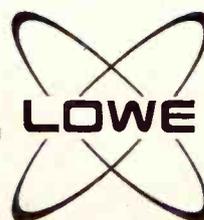
NRD-535	£1549
CMF78	£279
CFL243W	£415
Modifications (fitted at time of purchase)	£117

INTERNET ADDRESS:
order@lowe.demon.cc.uk.
info@lowe.demon.cc.uk.

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

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

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



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Chesterfield Road

THE WORLD



Decoding starts here . . .

Computers have changed the lives of almost everyone, particularly in the world of short wave and airband. Powerful software for decoding transmitted data is now readily available allowing short wave listeners access to wide ranging communications systems from RTTY news and weather transmission to detailed weatherfax images and our latest product, AIRMASTER, gives access to ACARS data sent from aircraft.

AIRMASTER

Decoding software and interface for ACARS - Aircraft Communications and Reporting System. Find out what's going on up in the skies! Works with any scanner as the signal source - just tune to 131.725MHz. AIRMASTER is the simplest and cheapest way to decode ACARS! **£89.00** plus P&P.

MODEMASTER2

Decodes FAX, RTTY, FEC, NAVTEX and Morse code. A truly comprehensive decoding package for IBM compatible PCs. Supplied complete with demodulator. MODEMASTER2 - just **£139.00** plus P&P.
MODEUP - Upgrade your original MODEMASTER to V2.0 - also adds NAVMAPS facility. **£49.00** plus P&P.

SYNOP

Decodes SYNOPTIC data to give text based weather information and real-time maps showing rainfall, temperature and pressure, etc. The data is collected by monitoring RTTY signals which report actual conditions and is collected from land based stations and ships at sea. In addition data is also transmitted by aircraft in flight. Data is updated on a three-hourly cycle. Be your own weather forecaster! SYNOP just **£149.00** plus P&P
SYNOPKAM adds SYNOP decoding to popular KAM or KAMPLUS TNCs **£89.00** plus P&P. WXMASTER adds SYNOP decoding facilities to MODEMASTER, increasing its versatility. **£89.00** plus P&P.

MULTISCAN

Control program for popular receivers including those from AOR, Yaesu, Kenwood, Icom and JRC. Allows scanning, searching and an excellent database is included, fully editable to configure for your own use. Demo disk available - just send six first class stamps and ask for 'Multiscan demo disk'. MULTISCAN just **£75.00** plus P&P.

SEARCHLIGHT

Control and recording software for AR3000A running under Windows. An excellent piece of software using the full potential of the AR3000 or AR3000A. A database is included and you can build on this to customise it for your own use. A rather nice feature for those with SoundBlaster cards in their PCs is that if it finds activity when scanning, it will digitally record what it hears for later playback. Demo disk available - just send six first class stamps and ask for 'Searchlight demo disk'. SEARCHLIGHT just **£99.00** plus P&P.

A little note regarding P&P - most of the above software packages are fairly lightweight and can be posted for £3.00. In the past this has resulted in delays and losses. A better service is to use our courier delivery which is just £5.00 for a 48 hour service.

You can pick these up from any Lowe branch or order by telephone or fax or E-mail via the Internet.

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

Please include your postal address and daytime telephone number.

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

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

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

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

Low Electronics

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

grassroots

rallies

1995

February 25: The 10th Rainham Radio Rally is to be held at the Rainham School for Girls, Derwent Way, Rainham, Gillingham, Kent ME8 0BX. It is very easy to find from Jn. 4 of the M2 motorway the A278 or from the A2 from Rainham. Doors open at 10am, 9.30am for disabled visitors. There will be many trade stands, plus a few new ones selling computers. Many special interest groups will be represented, ie. RAYNET, RNARS, Packet, KRGroup and Kent TV Group. There is also a talk-in on S22 by GB4RRR, a Bring & Buy, licensed bar, and snacks and refreshments also available with somewhere to sit and eat. Admission is £1, children under 14 free. Further information from **Martin G7JBO** on (01634) 365980 any reasonable time.

March 4: The Aberystwyth & DARS are holding their West Wales Amateur Radio and Computer Rally at The Aberaeron Comprehensive School, Aberaeron. Doors open at 10.30am to 4pm, with entrance fee being only 50p! There will be trade stands, special interest groups, a Bring & Buy, repeater group, computers, WFAX demo, h.f. and v.h.f. station on the air, packet radio and lots more for the amateur radio and computer hobbyist. There is a free raffle for a Venus DataPack, worth, £50. For more details contact **Katy GWOFFO** on (01545) 580675.

***March 11/12:** The London Amateur Radio & Computer Show will be held at Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London N9. Doors open at 10am to 5pm each day. There will be a trade show, lectures, Bring & Buy, on-demand Morse tests, facilities for the disabled, bars, restaurants, special interest groups and ample free parking. For further information you can contact **Steve White G3ZVW** on 0181-882 5125.

March 12: Wythall Radio Club will be holding their annual Radio Rally at Wythall Park, Silver Street, Wythall (near Birmingham), on the A435, just two miles from Junction 3 on the M42. Doors open at 10.30am to 4pm. There will be the usual traders in three halls, a marquee, a bar and refreshments and a Bring & Buy stall, run by the club. Talk-in on S22. Admission only £1. **Chris G0EYO** on 0121-430 7267.

***March 19:** The Norbreck Radio Rally, Amateur Radio, Electronics & Computing Exhibition is being held at Norbreck Castle Hotel, Exhibition Centre, Queens Promenade, North Shore, Blackpool. There will be extended free car parking and a free shuttle service. Novice Licence details and practical demonstrations, a Bring & Buy stall, talk-in on S22 and lots more. Admission is £1.50, over 65s £1 and under 14s free. Doors open at 11am to 5pm. Disabled entry through ramped entrance, 10.45am. More info from **Peter Denton G6CGF** on 0151-630 5790.

March 19: The Tiverton South West Radio Club are holding their 1995 Mid Devon Rally at the Pannier Market, Tiverton. Easy access, only minutes from junction 27 on the M5. Excellent free parking, two halls of trade stands, Bring & Buy stall and mobile snack bar. Further displays and full refreshments facilities in the club room bar, which is open throughout the day. Talk-in on S22. Doors open at 10am. Further details from **G4TSW, Mid Devon Rally, PO Box 3, Tiverton, Devon.**

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

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

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

April 9: Launceston's 9th Amateur Radio Rally is being held at Launceston College. There will be a Bring & Buy, Talk-in on S22 and Morse tests on demand (bring two passport photos). Hot snacks will be available from 7am. Doors open at 10.30am. Further information is available from **Roy G0KIC** on (01409) 22164 or **Rodney G8HDW** on (01566) 775167.

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

Editor

AVON

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

RSGB City of Bristol Group: last Tuesdays, 7pm. New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. February 28 - Talk on Portishead Radio. Dave Bailey G4NKT. 0117-967 2124.

South Bristol ARC: Wednesdays, 7.30pm. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. March 1 - 15m activity evening, 8th - Hand-held rigs, Rally and Bring & Buy, 15th - Model Railway magazine evening, 22nd - 10GHz activity evening. For more information ring (01275) 834282 on a Wednesday evening.

DERBYSHIRE

Derby & DARS: Wednesdays, 7.30pm. 119 Green Lane, Derby. March 1 - Junk sale, 8th - Railway signalling - then and now - an illustrated talk by John Jameson, 15th - Radio Link - an illustrated talk about Hospital radio, 22nd - AGM. Mrs Hayley Winfield, 2 Hilt Cottages, Crich, Matlock, Derbyshire DE4 5DD. (01773) 856904.

DEVON

Plymouth RC: Tuesdays, 7.30pm. The Royal Fleet Club, Devonport, Plymouth. February 28 - Talk by the RIS, March 7 - Business meeting and natter night. F. P. Russell on (01752) 563222.

EDINBURGH

Lothians RS: 2nd & 4th Wednesdays, 7.30pm. Orwell Lodge Hotel, Polworth Terrace, Edinburgh. March 8 - Junk sale, 22nd - Visit to Radio Forth. GM4DIJ, QTHR on 0131-337 7311.

ESSEX

Vange ARS: Thursdays 8pm, Barnstable Community Centre, Long Riding, Basildon, Essex. March 2 - Junk sale, 9th - Electric generators, 16th - Natter night, 23rd - Steam engines. Doris. (01268) 552606.

GRAMPIAN REGION

Aberdeen ARS: Fridays, 8pm. RC Hall, 70 Cairngorn Crescent, Kinloch. February 24 - Earnest Debate: 'This house believes that f.m. should be banned', March 10 - Junk sale, 17th - Talk on curing TVI and breakthrough. Martin GM0JCN. (01569) 731177.

GREATER LONDON

Edgeware & DRS: Thursdays, 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak. February 23 - Morse training evening, March 23 - Morse training evening. Rod Bishop. 0181-204 1868.

Southgate ARC: 2nd & 3rd Thursdays, 7.30pm. The Pavilion, Winchmore Hill Cricket Club, Firs Lane, Winchmore Hill, London N21 3ER. February 23 - Club radio on the air - a chance to improve your operating technique, March 9 - D-Day in Bletchley Park - regarding the Colossus computer, 10th - Southgate Amateur Radio Show setting up, 11/12th - 1995 Amateur Radio & Computer Show with the RSGB, 23rd - LAR&C Show debrief plus club on the air. M. E. Viney GOANN. (01707) 850146.

Club Secretaries:

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

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road SW19. February 24 - Desert island radio, March 10 - On air and general activity. Michael J. McCarthy G0AWQ. (01737) 351313.

HAMPSHIRE

Fareham & DARC: Wednesdays, 7.30pm. Portchester Community Centre, Portchester, Hants. March 1 - Get together and on the air, 8th - Talk, 15th - Get together and on the air, 22nd - Talk. Reg Griffiths G7NHN. (01730) 829206.

Horndean & DARC: 1st & 4th Tuesdays, 7.30pm. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. February 28 - Junk sale, March 7 - Club night. S. Swain (01705) 472846.

HEREFORD & WORCESTER

Bromsgrove ARS: 2nd & 4th Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. March 21 - Construction evening and contest. A Messenger G0TLK. 0181-777 0420

KENT

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. March 21 - Construction evening and contest. A Messenger G0TLK. 0181-777 0420

Medway AR & TS: Fridays, 7.30pm. Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham, Kent. February 24 - AGM, March 10 - Talk on Magnetism. G3VUN, 40 Linwood Avenue, Strood, Rochester, Kent ME2 3TR. (01634) 710023.

MERSEYSIDE

Wirral ARS: 1st & 3rd Wednesdays at Ivy Farm, Arrowe Park, Birkenhead, Wirral. Informal natter nights on each Tuesday. March 1 - R.A.R.E., 15th - Converting a PMR by Brian Jordan. A. Seed G3FOO on 0151-644 6094.

NORFOLK

Norfolk ARC: Wednesdays, 7.30pm. Formal and informal meetings at The Norman Centre, Bignold Road, Off Drayton Road between 'Asda' and Three Mile Cross Roundabout, Norwich. March 1 - Use of test equipment by Mike Lemin G4UUB, 8th - Night on the air, construction QRP, Morse practice and committee meeting, 12th - Trip to Picketts Lock Rally, 15th - CW National Field Day briefing, 22nd - Science for all by Arnold Tomalin G3PTB. Mike G4EOL. (01603) 789792.

NOTTINGHAMSHIRE

Mansfield ARS: 2nd Mondays, 7.30pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. March 13 - Junk sale, beer and chat night. **Mick G0UYD, QTHR.** (01623) 792243 or **Howard G1JGY, QTHR.** (01623) 423697.

South Notts ARC: Fridays, 7pm. Highbank Community Centre or Fairham Community College, Farnborough Road, Clifton Estate, Nottingham. February 24 - Basic first aid for the amateur radio shack by Mike Braidey - St John Ambulance Trainer. Julie Brown G0SOU. (01509) 672734.

OXFORD

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

SHROPSHIRE

Salop ARS: Thursdays, 8pm. Oak Hotel, Shrewsbury. February 23 - 23cms - the easy way - talk by G8DQI & G4EAB, March 9 - Eagle antennas by G4UDE, 16th - RAE tuition and workshop evening, 23rd - SARS open evening and on air event. Ian Davies G7SBD, QTHR. (01743) 463711.

SOMERSET

Yeovil ARC: Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. February 23 - First broadcasts in Britain by G3MYM (75th anniversary), March 2 - Committee meeting and club station on the air, 9th - Talk on the club archives by GOVFK & bring entries for constructors contest, 16th - Getting the best out of your aerial by G3GC, 23rd - Constructors contest adjudication by G3BPM. Cedric White, QTHR. (01258) 473845.

TAYSIDE

Dundee ARC: Tuesdays, 7pm. Dundee College, Graham Street, Dundee. February 28 - Question and answer forum, March 7 - Construction night, 14th - Power communications by Ron Payne GM4AWA, 21st - Construction night. Allan Martin GM70NJ, 11 Langlee Place, Broughty Ferry, Dundee, Tayside DD5 3RP.

WARWICKSHIRE

Stratford-upon-Avon & DRS: 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. February 27 - Test equipment evening with Terry G3MXH and Dave G6FEO. Martin Rhodes G3XZD. (01789) 740073.

WEST MIDLANDS

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

WEST YORKSHIRE

Denby Dale ARS: Wednesdays, 8.30pm. Pie Hall, Wakefield Road, Denby Dale, West Yorkshire. March 1 - Aspects of sky wave propagation by David G0EVA, 15th - Digital electronics and repeater controls by John G0PRF. Denby Dale ARS also provides RAE, Morse and Novice RAE classes and is a registered City & Guilds examinations centre for both the RAE and Novice RAE exams. Further details from the examinations secretary Brenda G4OTE on (01484) 424776 or secretary Kevin G1FYS on (01484) 547553 for club activities.

Keighley ARS: The Ingrow Cricket Club, Ingrow, Keighley. Thursdays, 8pm. February 23 - Quiz, March 2 - Natter night, 9th - Packet on the air G0KRS/G7KRC, 16th - Visit by Crime Prevention Officer, 23rd - Natter night. Kathy G0RLO. (01274) 496222.

WILTSHIRE

Trowbridge & DARC: 1st & 3rd Wednesdays, 8pm. The Southwick Village Hall, Southwick, Trowbridge. March 1 - Visit by Tim Walford of Walford Electronics, who will be talking and demonstrating The Somefset Range of Kits. Ian G0GRI. (01225) 864698.

New Products

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

Bust Your Scanner?

Scanner Busters is a Guide to the methodology of beating the electronic ban on Scanning. This book by D.C. Poole, deals quite comprehensively with the subject of scrambling and encryption systems. The author explains in simple terms how p.m.r. works, the new digital cellular radio telephone systems, spread spectrum, frequency hopping and emergency services communication. How to get more from your scanner and a list of frequencies to listen to are also covered. It is a great reference for both new scanner owners and veterans alike.

D.C. Poole is an Electronics Engineer and holder of an Amateur Radio Licence, he has built many radio projects. He has spent much time involved in scanning, digital systems and encryption in both the UK and the USA.

Scanner Busters costs **£4.95** and is available from the **SWM Book Service Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.**



FRG100 Keypad

The Electronic Hobbies Exchange Centre alias Martin Lynch, have just launched the MyDEL KP-100, an instant access keypad for the popular Yaesu FRG-100 h.f. receiver. In addition to frequency entry the KP-100 allows entry of memories and 'up and down' frequency shift.

The KP-100 is available at **£44.95 inc VAT plus £2.00 P&P** from **Martin Lynch, The Electronic Hobbies Exchange Centre, 140-142 Northfield Avenue, Ealing, London W13 9SB. Tel: 0181-566 1120; Fax: 0181-566 1207.**

COMINT Guide

Newly available from Lowe Electronics is *Hobbyists Guide to COMINT Collection and Analysis*, by Tom Roach

This book was written so that anyone with normal intelligence, and the inclination to do so, can engage in the esoteric and "hush hush" art of communications intelligence or COMINT. You will be surprised to discover the degree of success that a hobbyist can expect to achieve by a personal intercept and analysis operation of the sort described in this book.

At a minimum, you will be able to intercept an astonishing number of foreign communications, some broadcast, some administrative, some diplomatic. With the incredible computer power available today it is even possible to decode data transmissions sent by fax, RTTY, Morse and many other modes. This book will place in your hands the techniques required to routinely examine information that governments, corporations and even your next door neighbour would just as soon you didn't have!

Communications intelligence is considered by most governments as the most sensitive and secret of all their intelligence activities. Now you too can get in on the act! This book covers the equipment you need, including receivers, accessories and decoding equipment. It will also show you how to put it all together to form an intelligence gathering system. It then describes how you can analyse the material collected.

The author has many years of experience in COMINT and drew inspiration from the Kettering Group here in the UK. This group of amateur intelligence collectors was started at the height of the cold war by a school teacher who marshalled the talents of his high school students, and after a time, interested outsiders. During the 1950s through to the '70s the Kettering Group made astonishing discoveries about the Soviet space programme by listening to the easily accessible telemetry

from Soviet Sputniks. One of the Kettering Group's highlights was that they were able to pinpoint the Soviet launch facility at Plesetsk, which until then was a closely guarded secret.

The book's purpose is to expand the efforts of amateur listeners, and to make them read between the lines of everyday communications, opening their minds to all sorts of possibilities. Although the author's monitoring in early days was aimed at Soviet and Cuban intercepts (remember the Cuban Missile crisis?) he also broadened his knowledge of geography, current affairs

and accumulated endless details of soviet space tracking.

An excellent book that makes fascinating reading and a worthwhile addition to the thinking short-wave listener's bookshelf, **£19.95 plus £2.00 p&p**

Available only from: **Lowe Electronics Ltd, Chesterfield Road, Matlock, Derbyshire DE4 5LE. Tel: (01629) 580800, Fax: (01629) 580020** and by Email via the Internet at orders@lowe.demon.co.uk to place an order or info@lowe.demon.co.uk for other information.

Wide Temp 3.3V Quartz Oscillator

Wavelength Electronics have introduced a new range of Q-Tech military grade (MIL-0-55310) quartz crystal clock oscillators which they believe are the first wide temperature range devices for 3.3V circuits.

Q-Tech's MIL screened parts are designed to meet tough environmental conditions found in avionics. They can also be used in industrial applications such as rugged portable instruments and computers. For more information contact: **Wavelength Electronics Ltd. Tempest House, 15 Grosvenor Road, Broadstairs, Kent CT10 2BT. Tel: (01843) 602869, Fax: (01843) 862276.**



New AOR Scanner

The AR-2700 is a modern styled hand held wide band receiver, with optional voice recording and computer control. The AR-2700 will replace the extremely successful AR-2000 with the added facilities of auto power off, selectable 'automode' bandplan, digital recording and computer control.

The receiver features a large l.c.d. display which provides all required information, such as mode, frequency, memory channel number and battery condition. The display back lighting is switchable with a timer option.

The optional recording i.c. may be fitted to enable a 20 second recording to be made at the touch of a button. Once recording has been made it can be replayed an unlimited number of times. The message memory can, of course, be over-written as required.

The Data port is provided for computer control, and adaptation of the CU8232 interface is required for connection. The AR-2700 is due to be launched at the Pickets Lock show in March. RRP is expected to be around **£269.00 inc. VAT** Watch these pages for an exclusive review.

AOR (UK) Ltd. can be contacted at Adam Bede High Tech Centre, Derby Road, Wirksworth, Derbyshire DE4 4BG. Tel: (01629) 825926, Fax: (01629) 825927.





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ESSENTIALLY FOR YOU . . . IN MARCH 1995 HANDY HINTS ON CHOOING YOUR HF RECEIVER

Like last month we are dedicating this page to a particular topic of interest to all you scanner people. We are listing below a selection of 4 different HF receivers, from affordable to luxury. We hope that by giving a brief description founded on experimental use by qualified radio hams on our premises you will have a better idea of what facilities you want and which receiver will best suit you. Don't forget however, that our technical lines are always open and our staff will happily talk through any questions you have. Don't be shy because we all need to know something someone else knows and we don't, that's how we all learn.

LOWE HF-150 – ~~£389.00~~ Special offer – please call



This we recommend as being a very easy to use machine, and a very good buy for any beginner. The HF-150 is established as the best budget receiver in it's class. The front panel is simple, but the few controls do offer full flexibility. The HF-150 offers switched bandwidth synchronous detection on AM, auto-noise limiter and memory storage.

Studio rating the performance of the HF-150 is far above the retail price of £389.00.

LOWE HF-225 – ~~£475.00~~ Special offer – please call



The Lowe HF-225 known to be one of the easiest models to control with the most stunning of performances. This receiver offers you: 30 programmable memories, key pad, AM/FM detector, extension wharfdale speaker, carry case, internal nicad pad. On the reverse of this receiver there are multiple aerial inputs offering, coaxial and active whip suitability.

Studio rating not to be pre-judged by its looks but by what your hear, clear and defined excellence, at a cost of £475.00.

AOR 3030 – ~~£659.00~~ Special offer – please call



The AOR 3030 is a high quality receiver built to exacting standards with collins mechanical filter, 30kHz-30MHz, 7 receiving modes and frequency steps down to 5Hz. This receiver offers 100 memory channels, storing frequency, mode and filter.

Studio rating the 3030 receiver has an excellent sensitivity and superior build quality that puts it at the top of the value for money stakes at a mere £659.00.

ICOM IC-R72 £745.00 Special offer – please call

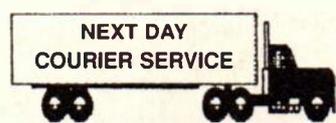


Although the most expensive of our selection, the Icom IC-R72 really gives versatility and sophistication, with a total of 99 memory channels and 2 additional scan edges the unit offers ample memory space, 30kHz - 30MHz frequency coverage. Built in clock, advanced DDS system for improved carrier to noise ratio, superb high sensitivity, built in 10dB pie amp, selectable noise blanker to name just a few features.

Studio rating this receiver would really suit someone who has had previous HF experience and would fully appreciate the facilities that the IC-R72 has to offer priced at £745.00.

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A Day In The Life of a Radio Inspector - Plastics Welder Interference

J. Edward Brown continues the
tales of the Radio Inspector.

Young Golly the radio inspector trainee had gone out alone to investigate a complaint of television interference. "I think it's a plastics welder, but there's so much traffic, it's difficult alone to drive and try to find it by intensity," said Young Golly.

Kilocycle Ken the senior radio inspector said, "I'll go with you."

"Do you want to see the complainant first?" Young Golly said.

"Sure."

"And you can too,"

Young Golly said lasciviously. "She's wearing a see-through blouse!"

Open All Hours

Young Golly parked the Post Office Ford Sierra estate outside the complainant's 'Open All Hours' type of shop. A row of posters for magazines and papers lined the outside wall of the Mini Mart, and a rack of paperback novels hung on the open door. But Ronnie Barker wasn't behind the counter. Young Golly leered at the young blonde.

"Golly," she said.

"This is my boss,"

Young Golly said. "What he doesn't know about television interference isn't worth knowing."

She smiled at Kilocycle Ken. "Come in."

It required some imagination to think that the blouse was transparent, but

Young Golly had the imagination of the young.

They walked through a flap in the counter, ducking under bagged sweets strung at head height, into the living accommodation behind, past crates of Fanta and Coca-Cola stacked in a corridor.

"She calls you Golly," Kilocycle Ken said softly.

"I was looking at her set and she said Golly and I turned round."

"A likely story," Kilocycle Ken muttered.

In the kitchen a big Maori in pyjamas sat on an old wooden table eating baked beans on toast and reading *Best Bets*, the *New Zealand Herald* was open at the racing page. Radio Pacific was broadcasting a race from Ellerslie through a large Japanese boom box with multiple knobs and speakers. Action TV, the u.h.f. racing channel was on the television set.

Great And Small

The blonde switched the television to TV One and *All Creatures Great And Small*.

"Hey," he said.

The television was a Philip's K9 chassis, once made in New Zealand, but not since import liberalisation had wiped out the NZ TV assembly business.

The programme disappeared in a moire patterning caused by a strong interfering signal. "There it is!" The old cry of every complainant sighting

the interference.

"When did it start?" Kilocycle Ken asked.

"A week ago," she said. "I like my television, when I get away from the shop, but every few seconds it's blotted out. And it's night and day, didn't stop on Sunday."

Outside, Young Golly said, "Why is that beautiful woman married to a layabout."

"It's hard work picking race horse winners," Kilocycle Ken said.

Kilocycle Ken drove slowly, Young Golly watched the output meter connected to the Sprague 610 receiver.

"Yeah it's a plastics welder, there's that deep booming sound which drifts through the receiver's passband," Kilocycle Ken said. "As the weld is made the dielectric alters and pulls the welder's frequency."

"I've got 60dB of attenuation in now and it's pinning the meter," Young Golly said. "We're on top of it."

It was an old area, a motor vehicle type retailer, a used car yard, a pub famous for its poetry readings, a Salvation Army Opportunity Shop, a Lebanese restaurant, and a 1900s wooden warehouse with a cart dock. "It's coming from there," Young Golly declared.

"That used to be a chewing gum factory," Kilocycle Ken said.

"You've been around a long time," Young Golly

muttered.

They went in past rolls of imitation leather, Young Golly carrying the portable Sprague.

"Yes?" the Indian woman in a sari said severely. She was arranging plastics watchstraps in a cardboard box.

"Post Office Radio Inspectors," Kilocycle Ken said.

Plastics belts, like gaudy deflated snakes were slung carelessly across a table. Heaps of plastics handbags required handles. A small woman at a plastics welder was making imitation leather wallets complete with imitation stitching.

Another operator was welding beachballs of variously coloured plastics segments. A brown Polynesian was welding seams on yellow plastics coats, she worked effortlessly, monotonously, positioning the material. Pull the lever and the cover closed, a click as the timer activated the welder and held it for the required period.

High Frequency

"So?" the Indian woman said.

"Have you got a permit for these high frequency welders?" Kilocycle Ken asked.

She said, almost incredulously, "I didn't know permission was wanted from the Post Office. I buy postage stamps from the Post Office."

"These machines are causing radio and television interference," Kilocycle Ken said severely. "Radiating out into the air."

The Sprague belched sound.

"It's that one." Young Golly said.

The sound coincided with the plastics wallet operator's movements.

"The person who installed this equipment would have told you that a permit was needed." Kilocycle Ken said.

"He didn't say anything," she said defiantly.

Kilocycle Ken sighed. "In particular, I've seen that machine before, know it from several other factories. It has caused trouble where ever it's been."

The woman had obviously been in this business for some time. She shrugged.

"Where did you get it?"

"From a bankrupt factory, long ago, it has been in storage."

The wallet-making machine was two 813 valves in a wire cage.

"The power transformer is from an old RCA ET4336 war time transmitter," Kilocycle Ken said. "It's just a half a kilowatt radio transmitter with the energy fed into the metal jaws instead of the antenna and the jaws weld shapes, bags, notebook covers, raincoats. But there's no way that it can be stabilised, it's not crystal controlled, just a self-excited oscillator."

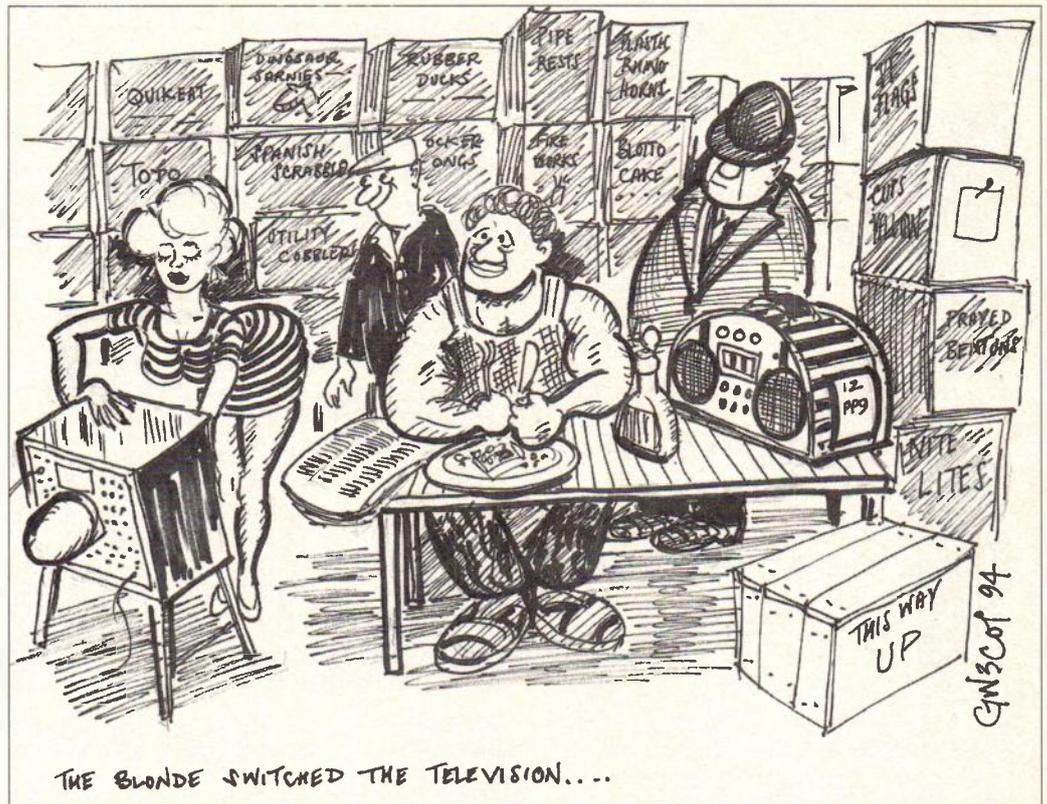
The Indian woman frowned.

"It is also not on an Industrial Scientific or Medical frequency," Ken turned to the woman. "Want to check the frequencies of all your welders?"

She just sighed.

Three were on the 27MHz ISM, but the offender was operating on 13MHz.

"Okay," Kilocycle Ken



said soothingly. "We'll issue you with a high frequency permit, which is the way we keep tabs on this sort of equipment, know where they are, in case of trouble. But it can't include this one.

The technician who built it did so when it was impossible to bring in h.f. welders, they were expensive and import licences were required and were difficult to get, and he filled a need of the times, but those times are over, this is a relic, a museum piece. The others, the Redifons are okay."

Night And Day

"It could be blotting out radio model control," Young Golly said.

There was an argument. "You want me to stop using it right now? You throw people out of work."

"You are interfering with television reception over a large area, and doing it night and day, seven days a week."

"I have a large contract. You tell me how to fix it so I

can use."

"It's impossible, even with mains filtering, screens on the machine. Maybe a completely screened room would stop it."

"How much it cost?"

"Thousands, has to be metal mesh. It would be cheaper to buy a new machine."

"They cost thousands of dollars."

"And this one looks as if it cost thirty bob." Kilocycle Ken was almost losing his temper. "If you don't stop using it I'll issue an order for you to cease. We could take you to court."

"Okay," she sighed. "We stop on this machine. I get another one."

"Thank you for your co-operation," Kilocycle Ken said.

"Here, have a beach ball," the Indian woman said.

"Thanks," Young Golly said.

Outside, Kilocycle Ken muttered, "Bribery."

"You wouldn't have enough puff to blow up one of these, at your age," Young Golly said.

"Don't you believe it."

"Let's go back to the complainant and tell her the good news," Young Golly said.

Kilocycle Ken said, "Luckyly this sort of problem is disappearing as most of the h.f. welders we see today are operating up to 2450MHz, but there are some applications which need the lower frequencies, and there has been talk that operators of these machines are exposed to radiation damage. Could be. Technicians working on radar transmitters are warned of the dangers of exposure. Radio waves can burn holes in your intestines."

"Those welders are not much different to diathermy machines," Young Golly said. "I've been treated with one after a football injury."

"It could be said the operators are getting free physiotherapy treatment while they work," Kilocycle Ken said.

"I know somebody I'd like to warm up." Young Golly sighed.

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Reviewed in January

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FRG-100



As new

£419

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MVT-7100



0.1 - 1650MHz

All mode (incl SSB).

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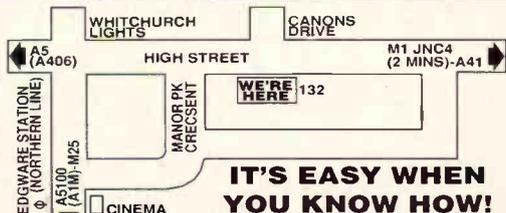
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MFJ-8400K 144MHz Receiver Kit



Building your own receiver is fun, as well as being educational.

Dick Ganderton has been looking at an American produced kit for a 2m amateur band receiver.

The 144MHz (2m) band is probably the most popular amateur band, world-wide. The UK allocation covers 144.000 up to 145.999MHz and is used for most types of amateur transmissions. Although the lower half of the band is set aside for such uses as s.s.b., c.w., RTTY and beacons, the most popular use for the other half is mobile and hand-held portable. At any radio rally you can see amateurs walking around with their 2m hand-held transceivers talking to each other. However, for an unlicensed listener, a transceiver is unnecessary - if not verging on the illegal. So, why not build a simple receiver to enable you to listen to what is going on on the 2m band?

Ultimate

Kits come in all sorts of disguises. Even some of the so-called complete kits often leave some items to be supplied by the builder.

The MFJ-8400K 144MHz Receiver Kit, made in the USA by MFJ Enterprises, Inc., however, really is complete - except for a battery and one other item that will be mentioned later in the review.

The ultimate in kits were, probably, those marketed by the well-known, but sadly now defunct, Heathkit organisation. Their kits really were complete, well thought out and had some interesting techniques to enable even the non-technical enthusiast to build a working piece of gear first time. MFJ Enterprises seem to have taken on board a lot of Heathkit ideas as to what a kit should be.

Unassuming

The MFJ-8400K comes in a fairly unassuming, but very strong, cardboard box, which turned out to be large enough to contain the completed receiver.

On opening the box the contents were well packaged. The Instruction

Manual was large and readable - but more practical than glamorous. A well produced and written set of instructions is vital to the success of any kit and these fitted the bill very well. The first part of the manual covered what the kit was setting out to achieve, what the 2m band is about, how repeaters operate - although this refers to the US '2-Meter' scene - and how the receiver works, all aimed at the beginner. Then comes a section for 'experienced hams and engineers'. This explains in more technical detail the workings of the set. Next comes sections on the receiver's controls, antennas, where to listen for signals - not really relevant to the UK since the US 2m band extends to 148MHz - a glossary of terms and then hints and tips on construction.

The actual instructions are well thought out with each step having two boxes in front of it. The first box you tick when you have completed the step. The second box you mark

as you inspect the completed p.c.b. Full marks for this as it enables you to keep track of where you are. The first step is to check off each component against the full parts list. Here I came up against the first problem. Being an American kit all the screw sizes are totally alien. Just what is a #4-40 machine screw? I took the easy way out and left all the screws until such time as I needed them and then picked the ones that seemed to fit best. However, I have compiled a comparison table to ease identification.

Screws

I usually have my own order for placing components on a p.c.b., starting with all the smallest ones first and then progressing upwards in size. However, this time I did follow the instructions to the letter and found no problems with making up the p.c.b., each stage being ticked off as it was completed. Component identification

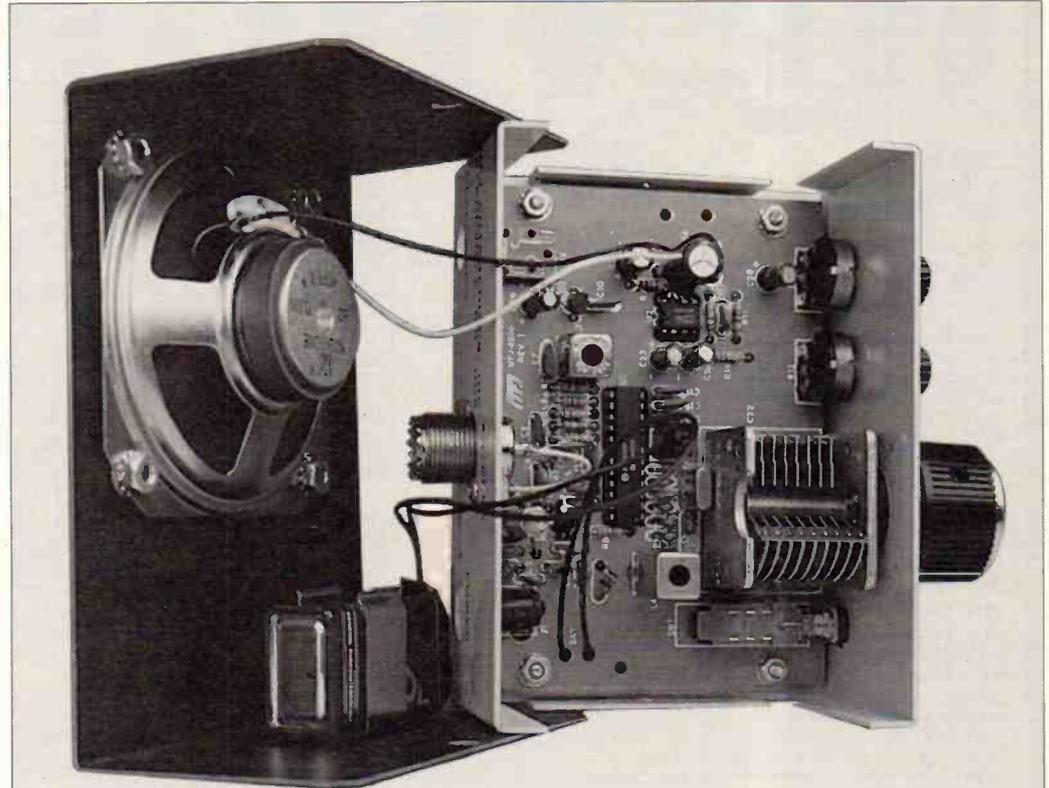
was easy as a reasonably accurate physical description was given with each stage.

I did, however, run into difficulties with the screws and other mechanical bits. Not just because of the strange screw sizes. The instructions used various bits, such as p.c.b. mounting spacers that bore no resemblance to anything in the kit! I ended up having to devise my own way of using what was in the kit to mount the p.c.b. into the case.

It Works!

I managed to complete the kit in a pleasant evening sat in an armchair in the lounge - thus helping to counteract Brown Owl's usual complaint of being left alone while I am down in the workshop making those little curly bits of metal that she always seems to find in the carpet! Power was applied from a bench power supply via a temporary pair of wires - no PP3 battery being available and no power plug being supplied to fit the coaxial power socket. The appropriate noises, as described in the initial testing section of the manual, emanated from the speaker - proving that

Continued on page 22



How the MFJ-8400K 144MHz Receiver Works

A two section bandpass filter in the antenna input rejects out-of-band signals and matches the 50Ω antenna line to a low noise pre-amplifier biased for minimum noise figure. This boosts incoming signals by approximately 20dB. The untuned output of the pre-amplifier is fed to a monolithic dual-conversion f.m. receiver i.c. The 1st mixer of this down-converts the 144MHz signals to the 10.7MHz 1st i.f. The 1st local oscillator is a tunable Colpitts oscillator running at around 130MHz. All the LC tank components are selected for temperature and mechanical stability and a voltage regulator ensures electrical stability. A 10.7MHz ceramic filter establishes a 100kHz bandpass window for the 10.7MHz 1st i.f.

Although some conversion gain is realised at 10.7MHz, most of the overall receiver gain is focused in the 455kHz 2nd i.f. to limit intermodulation distortion. The 2nd l.o. is crystal controlled and the 2nd mixer output is filtered for message channel bandwidth by a 20kHz f.m. data bandwidth ceramic filter. After amplification and limiting, the 455kHz signal is fed to a quadrature detector for audio recovery. The audio signal is then amplified to quasi-line level.

The unscquelched audio output from the f.m. receiver i.c. is fed to the packet monitor jack and also to the a.f. amplifier i.c. via the volume control. The a.f. amplifier i.c. is a gated device and boosts the audio output to drive the speaker and provide a squelch gate for voice signal monitoring.

The remote signal sensing indicator (RSSI) output from the f.m. receiver i.c. drives the squelch circuit. This level is sampled across the squelch sensitivity control and fed to a comparator. Any time the sampled RSSI level drops below the fixed reference level, the comparator triggers the receiver i.c. into its low-current standby mode, shutting off the speaker and reducing receiver power drain. When an incoming signal, or a change in the squelch setting, causes a rise in RSSI voltage, the receiver is triggered on. This Tailfree™ squelch circuit responds instantaneously to the presence or absence of signals, eliminating squelch lag and annoying noise bursts, characteristic of hysteresis squelch.

Screw Thread Comparison Chart

US		Nearest BA		
Size (#-t.p.i.)	OD (in)	Size	OD (in)	t.p.i.
#4-40	0.112	6BA	0.110	47.9
#6-32	0.138	4BA	0.142	38.5
#8-32	0.164	3BA	0.161	34.8
#10-32	0.190	2BA	0.185	31.4
#10-24	0.190	2BA	0.185	31.4

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MVT-8000...Mobile, with PSU.....	£369
VT-225...Civil/Military Airband.....	£249
VT-125...Civil Airband.....	£189

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VT125...Original Handbook.....	£7.95
VT225...Original Handbook.....	£7.95
MVT7000...Original Handbook.....	£8.95
MVT7100...Original Handbook.....	£8.95
MVT8000...Original Handbook.....	£9.95
VT125...Original Replacement Ant.	£12.95
VT225...Original Replacement Ant.	£29.95
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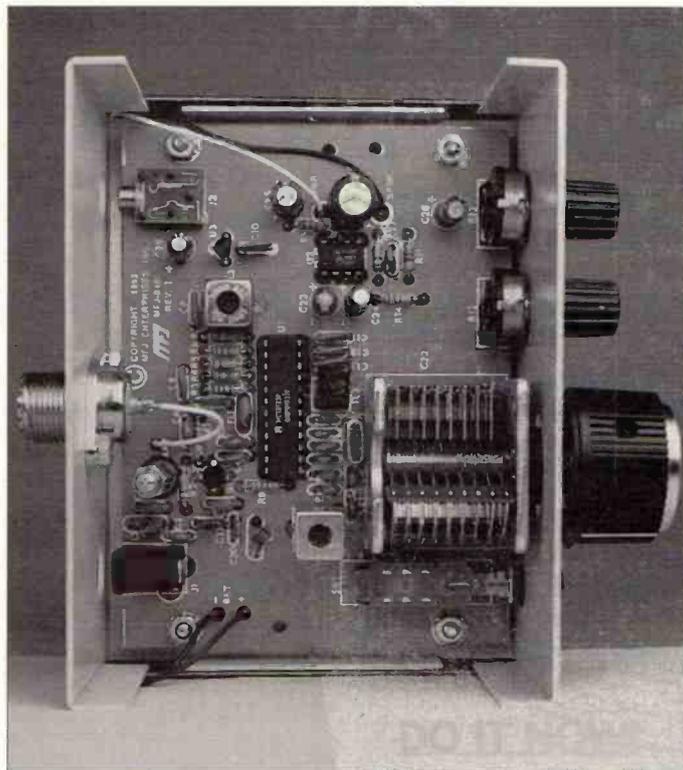
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all was well. The only tools needed are a 15W soldering iron, resin-cored solder, a small pair of side cutters, small snipe-nose pliers and a small screwdriver set. With just these you can enjoy yourself and build a radio!

Calibration

Having checked that the set worked, albeit while installed in the case contrary to the instructions - well, it was such a struggle getting it into the case that I didn't feel like prising it all out again only to have to shoe-horn it back in - it was time to perform the final v.f.o. calibration. This entails adjusting the ferrite core of one of the inductors. This requires the use of the correct plastics hexagonal tuning tool. This really held up proceedings, as I couldn't find a suitable trimming tool anywhere in my toolbox. Why, oh why, cannot kit manufacturers supply a suitable tool with the kit? I had to ask around my friends until I found one who could lend me a



The completed 2m receiver kit.

suitable impliment.

A choice of four methods of calibrating the set is provided. From these you should be able to find one method that fits the test equipment you have - or don't have!

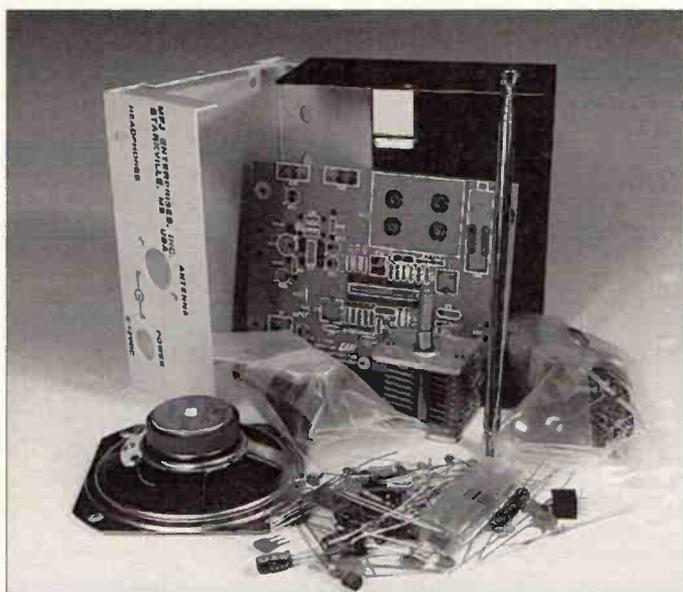
Adjusting the v.f.o. proved to be a very delicate operation as the position of the ferrite core

was critical. However, it was achieved and the set performs commendably and with reasonable sensitivity. The telescopic whip antenna is simply screwed onto the p.c.b. through a plastics bushed hole in the top of the case. If required an external antenna can be plugged in to the SO-238 coaxial

socket on the back panel. This is not quite the same as the SO-239 socket normally used in the UK, although it is possible to get a PL-259 plug into it with some firm, but gentle, persuasion.

Price

I thoroughly enjoyed building the MFJ-8400K 144MHz Receiver Kit, which costs £79.95 inc. VAT and postage from **Waters & Stanton, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835.** My thanks to them for supplying the kit for review. My only gripes concern the lack provision of a suitable tuning tool, the lack of any explanation of the change in the p.c.b. mounting details, and no matching plug for the power socket. Other problems would be best addressed by the UK importers supplying a suitable leaflet with each kit explaining the US screw system and the differences between the UK and US 2m amateur bands. ■



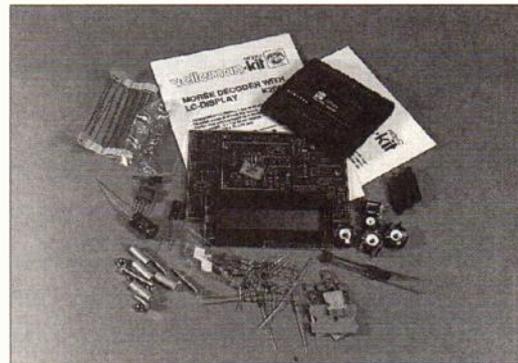
The MFJ-8400K kit really is complete.

Specification

Frequency Coverage:	144 - 148MHz.
Mode:	FM only.
1st i.f.:	10.7MHz.
2nd i.f.:	455kHz.
Controls:	Tuning, continuous. 8:1 reduction drive. Squelch. Volume. Power on/off.
Packet Monitor:	3.5mm jack socket on rear panel. Constant level, unsquelched.
Antenna:	Built-in telescopic whip. 50Ω SO-238 socket.
Power:	9V PP3 battery. 6.5 - 15V d.c.

Velleman Morse Decoder Kit

Dick Ganderton tries out a Morse decoder kit to overcome his inability to read Morse.



If you can read Morse code you will have very little interest in this kit.

It is aimed at those of us who seem unable to get to grips with this form of communication. Morse is still used by radio amateurs, particularly those interested in QRP - low power. So a simple piece of equipment to enable such transmissions to be decoded and displayed should be welcome. The Velleman K2569 Morse Decoder kit is such an item.

Bandoleer

This kit is packaged in a transparent plastics 'lunch box' which is big enough to hold the completed unit. However, the box is obviously not intended as the final housing for the decoder, although, with a bit of ingenuity it could be pressed into service. No housing is supplied nor is anything suggested.

The instructions come in the form of a small multi-lingual booklet - Dutch, French, English and German being the languages catered for. No

checklist of the components is provided and neither the circuit diagram or the component placement drawing gives any indication of component values. Each stage of assembling the components onto the p.c.b., however, has a description of the component involved and if you really get stuck, a separate little booklet offers help in the form of drawings of different components.

I found the first instruction, 'Fit jumper J', a bit unusual, as I am used to using the bits of wire, clipped off of components after soldering, as wire links - and as I hadn't soldered any components in place I had no wire off cuts for links! However, all the axial lead components were supplied on a 'bandoleer' and at the ends of the bandoleer were several lengths of plain tinned copper wire. So I used one of these. Then the penny dropped. The first component on the bandoleer was Jumper J! The bandoleer had been assembled with the components in the order in

which the instructions told you to place them. A brilliant idea - but why wasn't this explained?

Assembling the kit took about an hour and was fairly straightforward. The only components that I had any trouble with were the three large trimmers - and all I had to do to these was to straighten one of the leads and bend it to fit.

I decided to fit the microphone directly onto the pins on the p.c.b. rather than on a length of screened cable, but this can make it difficult to place the microphone in the right position relative to the radio while still being able to read the display. With hindsight it would be better to connect the microphone via a reasonable length of screened lead.

Acoustic Connection

The only connection to the radio is an acoustic one - the microphone picking up the receiver's audio from its loudspeaker. While this enables the decoder to be used with any radio, even one without any monitoring output facilities, it does make it a bit more difficult to get the set up right. Receivers without a monitoring facility generally have filters that are far too wide for c.w. use. One solution would be to use an audio filter to narrow the bandwidth.

Narrow Bandwidth

A receiver designed for Morse reception will have a very narrow bandwidth to allow individual signals to be tuned in whilst filtering out unwanted ones close by. I found that the unit didn't like noisy signals or signals composed of more than one QSO.

By persevering, however, I was able to get it to decode some amateur signals. The alphanumeric liquid crystal display shows one line of 16 characters and the messages 'move' along the display from right to left. Once a character has dropped off the left hand edge of the display it has gone for ever, so a means of writing down the messages is needed. At the 'standard' 12w.p.m. of amateur c.w. a character is going to drop off the end every 0.8s, so you need to write quite fast to keep up. The instructions suggest that the decoder can 'keep up with the quickest signallers' and 'neatly notes everything on a display'.

The Velleman K2695 Morse Decoder with LC-Display offers a simple, reasonably priced, introduction to Morse listening and costs £58.75 inc. VAT from **Cirkit Distribution Ltd., Park Lane, Broxbourne, Herts EN10 7NQ. Tel: (01992) 448899.** My thanks to Cirkit for supplying the review kit. ■

Specifications

Display:	Liquid crystal 1 line of 16 alphanumeric characters.
Controls:	Sensitivity Centre frequency Lock range Display contrast
Power:	8-0-8V a.c. at 150mA or 9 - 12V d.c. at 100mA
Dimensions:	105 x 70 x 28mm



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Restoring a Hallicrafters Model S38D

Chas E Miller recounts how he acquired and subsequently restored this four-band model.

The best policy when buying goods at auction is to examine the items well to ascertain their condition and worth before making bids. However, very occasionally sheer instinct may pay off, as happened to my wife and myself at a small country auction while we were on holiday last Summer. This regular weekly event is held in an open market place with the items for sale being stacked both on and under a series of trestle tables arranged to form a hollow square of approximately twelve-foot sides, with the auctioneer imprisoned in the centre.

We arrived just as the sale was about to commence, by which time a crowd of punters had gathered two and three deep around the tables, making it impossible to do more than cast an roving eye over the lots in the hope of spotting something of interest. Nothing on the table tops appealed to us particularly and little could be seen of what lay beneath them except the outsides of cardboard boxes that were rapidly disintegrating under the heavy rain that had been falling since daybreak.

We were about to turn away with a mixture of disappointment and relief when we noticed under a table opposite to where we stood the end of what

looked like a grey steel box, just visible under a miscellany of old junk. Something about this steel box told me that it might well be worth investigation, but that was exactly what we could not do. It would have been quite impossible to attempt to wriggle between the legs of the punters opposite to get at it and all we could do was to move our position a little in the hope of getting a slightly better view. We were rewarded by a glimpse of chrome strip and of glass, suggesting that here was either a small piece of radio test equipment or an actual receiver. On that slight hope we resigned ourselves to waiting in the pouring rain until such time as it was put up for sale, but the soaking we received proved to have been worthwhile. When held up by the auctioneer, the steel box was revealed as the case of a small communications receiver about the size and the appearance of the well-known Eddystone EC10.

Sorry State

Someone else in the crowd must have recognised it as well, for I had to bid up to seven pounds - a good sum by the standards of that particular auction - before it was knocked down to me. When it was handed over I did no more



The actual S38D referred to in the text, complete with warts and all!

than glance at it long enough to find that it was a four-band Hallicrafters model in a sorry state of sogginess. The fibre-board back and bottom were almost falling to pieces and the dial had become vertically corrugated along its entire length, making the markings indecipherable. There was nothing to be done at that time other than to leave the set to dry out, so it was stored away in our caravan until we returned home.

A week later I took the set into the workshop for examination and attention, where I found it to be a Hallicrafters model S38D covering 550kHz to 31MHz in four bands, 550kHz - 1.6MHz, 1.7 - 5MHz, 5 - 14MHz and 13 - 31MHz. In addition to the main tuning control a band spreading device was provided. The circuitry was not, on the face of it, particularly impressive, being just that of a conventional four-plus-one superhet for 105 - 125V a.c./d.c. mains. The valve line up was, or should have been, a 12SA7 mixer, 12SG7 i.f. amplifier, 12SQ7 detector and a.f. amplifier, 50L6 output and 35Z5 rectifier, but someone had fitted a mains transformer, wired two

small silicon diodes across the empty rectifier valve holder to provide the h.t., changed the first three valves to their 6.3V heater equivalent types (6SA7, 6SG7, 6SQ7) and the output valve to a 6V6G, and had butchered the under-chassis wiring to convert the heaters to parallel operation. In short, it looked a mess. The sole hopeful sign was that the dial had dried out perfectly and, almost incredibly, looked none the worse for its misadventure.

For anyone wishing to restore a receiver in this kind of condition to something like originality there is really only one sensible way to tackle the job, that being first to strip out all the obvious non-standard bits and pieces that have been fitted. Even in the absence of a circuit diagram there should be no great difficulty in distinguishing newer components from those used by the manufacturer. This process usually leaves disconnected wires all over the place, but finding out where they should go is still likely to be a lot easier than trying to get inside the mind of the previous owner.

Colour Coding

In the case of the S38D, colour coding is used for the various connecting wires, e.g., pink for h.t.+, light brown for valve heaters, yellow for grids, blue for anodes and black for h.t.-. Generally speaking only the h.t.+, h.t.- and heater leads had to be re-located, and the loose ends left were still long enough to be put back where they belonged once these positions could be traced. This was done empirically by relating the base pins on the valve holders to their likely connections to surrounding components. At this point it is possible to reassure nervous readers who may have misgivings about an a.c./d.c. receiver in a metal cabinet. Whilst it was normal practice to connect one pole of the mains input to the chassis it is by no means essential. The alternative to using the metalwork as an h.t. negative rail is to fit a distinct line isolated from chassis as regards d.c. but decoupled to it as regards r.f. currents by a number of small capacitors at various strategic points along its length. This was the method used in the S38D. The metal case was further isolated from the chassis on the belt-and-braces principle by having it attached via rubber bushes. The previous owner had by-passed the decoupling condensers with a shorting link taking the h.t.- to chassis, which I immediately removed.

Correct Valves

With their heater wiring having been restored to its original series arrangement, the correct valves were installed. The combined heater voltages

of these add up 122.8V, enabling them to be powered directly from 110/120V American mains supplies without the need for a ballast resistor. The h.t. voltage also being derived directly from the mains, its smoothed value is seldom much more than 100V. However, the valves are designed from the start to work with this nominal voltage and there is little to be gained - and maybe something to be lost - if it should be increased. Thus, rather than anglicise American receivers to operate on 240V mains, it is my practice to operate them from a step-down mains transformer giving a nominal 120V. I am fortunate in having acquired some time ago a large double-wound transformer which was at one time used to power an American computer and appears to be of about 500W rating. It is housed in a metal case fitted with an American type mains socket and thus is ideal for the job. However, a normal 240/120V auto-transformer is perfectly suitable provided that non-reversible plugs and sockets are used to ensure that the receiver is placed across the 'bottom' of the winding with its chassis connected to the neutral side of the 240V input. It is worth remembering that imported photo-copiers, now appearing at your local friendly rubbish tip, usually contain an excellent auto-transformer with a rating of up to 1.5kW.

It has to be confessed that in one small respect the heater wiring was not restored to originality, this being the position of the dial lamp in the chain. Following common US practice, it was originally shunted across a section of the 35Z5 heater, which is tapped especially for that purpose. Since the 35Z5 is

not as easily obtained as the 35Z4, which has the same ratings except for the tapped heater, the latter type was fitted and the lamp transferred, shunted with a 50Ω resistor, to the neutral mains return lead. This position has two advantages, the first being that in a.c./d.c. receivers it enables the lamp to be operated at low potential with respect to chassis, the second that since the h.t. current also flows through the lamp it tends to counteract the dimming effect that takes place as the valve heaters warm up and change their resistance. As regards the rest of the valves, these are plug-in replacements with no circuit changes being required other than the fitting of the correct value bias resistor for the output valve, which had been changed to suit the 6V6G.

On the h.t.+ line, all the original smoothing components and wiring had been removed by the previous owner when the mains transformer had been installed and thus this section of the receiver was rebuilt to absolutely typical American standards. For the reservoir and smoothing capacitors a compact 32 + 32μF unit was installed in what was clearly the correct position, which was complete with soldering tag for the common negative that was isolated from chassis. The h.t.+ supply to the output valve anode was taken directly from the rectifier cathode, with a smoothing resistor from this point to supply the rest of the set including the output valve screen grid. The typical value of 2.2kΩ, 1W rating, was employed. As remarked earlier, since

American a.c./d.c. valves are designed to work from a 100V h.t. line, there is no need for dropping resistors and, to a large extent

decoupling capacitors for the screen grids of the earlier valves. This reduces the number of components used in the set and simplifies the layout.

First Tests

The stage had now been reached where the S38D could be powered up for its first tests. These revealed it to be lacking badly in sensitivity, with only a few very powerful local m.w. stations receivable. The cause of this was traced to the secondary of the second i.f. transformer being open circuit. The i.f. transformers in this set are diminutive and require considerable care in being removed and dismantled for inspection. The actual windings are contained inside small iron-dust pots and are of such fine wire that, had a break occurred within the secondary, re-winding by hand would have been virtually impossible. In the event the break was clearly visible in one of the lead-outs down to the base tags and it was possible to effect a rapid repair with the aid of a short length of 5A fuse wire.

Following reassembly the i.f. transformers were aligned carefully to the American standard 455kHz, and demonstrated the impressive amount of gain provided by the 12SG7 i.f. amplifier. The mutual conductance of this valve is 4.1mA/V when operated with 100V on anode and screen grid, giving it a sensitivity nearly twice that of the more familiar 12SK7. Since it appeared that the r.f. alignment too may have been disturbed this was next in line to receive attention. The antenna and

Continued on Page 28

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local oscillator coils in the S38D are air-cored with four windings on each and with compression trimmers fitted across them on thin but rigid steel strips. As its relative trimmer is mounted directly above each of the windings it was easy to deduce the alignment sequence. In the absence of specific instructions the alignment points for each band were taken as 150kHz for band 1, 4.5MHz for band 2, 13MHz for band 3 and 28MHz for band 4. Fixed padders are used for the three higher frequency bands, leaving just one adjustable type for band 1 which was set at 600kHz. These adjustments resulted in another significant improvement in gain.

Vintage Cossor Wobbulator

For the record, when giving communications receivers the complete re-alignment treatment, I use a 1936 vintage Cossor wobbulator in conjunction with a c1948 Hartley oscilloscope for the i.f. transformers, and a Marconi TF86 for the r.f.

sections. From time to time the two signal generators are checked with the aid of a Hewlett-Packard frequency counter; as yet their accuracy remains extremely good. Even with the use of a general purpose generator such as the popular Advance E2, very acceptable results may be obtained, my example showing an accuracy which more than matches that obtainable on relatively simple dials like that of the S38D.

A contemporary advertisement for the lower-priced Hallicrafters receivers claimed that engineers and owners alike were surprised by the performance of these sets; and going on the next antenna test this was a fair assertion. Certainly I was amazed by the sensitivity and selectivity of the S38D, the credit for which much belong in part to the 12SA7 pentagrid frequency-changer, which has a conversion conductance that is more than 20% better than that of the perhaps more popular 12K8 triode-hexode. Large numbers of stations were receivable on all bands except (not

unexpectedly) the highest and although the a.v.c. system is of the 'simple' type, derived from the detector load and not delayed, it appears to function satisfactorily. From a technical point of view I would rather see a better system with a separate a.v.c. rectifier and several volts of delay, but I have managed to resist the temptation to carry out modifications.

The Hallicrafters has a b.f.o. facility which is nothing if not ingenious. A thick piece of well-insulated wire is looped around the grid pin of the i.f. amplifier valve holder but not actually connected to it. The wire then snakes along the under chassis, around the lead from the second i.f. transformer to the detector diodes, and on to a small front-mounted single-pole two position slide switch. The centre, moving, contact is connected to the common h.t.-line whilst the other fixed contact is taken to the a.v.c. line via a 47k Ω resistor. In the normal position the thick wire is joined to the common h.t.-line and the one end of 47k Ω resistor left unconnected. When the switch is in the 'CW' position the thick wire is simply left floating, to induce sufficient instability by its small capacity coupling effect to make the i.f. amplifier oscillate at close to its operating frequency. At the same time the 47k Ω resistor is connected to the h.t.-line, thereby disabling the a.v.c. Despite the simplicity of this arrangement, the S38D will resolve s.s.b. very well indeed. The standard test here is to use the RAF Volmet transmissions, which may be expected to be of high stability and will soon reveal any deficiencies in this respect in receivers. It is thus pleasing to be able to record that tuning drift was only very slight and could be rectified instantly by means of the band-spreading capacitor. This, incidentally, takes the form of two extra vanes mounted on a spindle alongside the main tuning condenser and arrange to mesh in and out of its fixed vanes. To permit this, its own moving vanes have one segment

removed close to their outer ends. There is a small bandsread dial below the main one, calibrated arbitrarily from 0 - 100. A legend to the left of this commands the operator to set it to zero before starting to use the main tuning control, which seems rather odd. One feels that it might be better to commence with the bandsread vanes at the half way mark to give adjustment either side of the frequency selected on the main tuning, but presumably Hallicrafters knew best.

Ample Volume

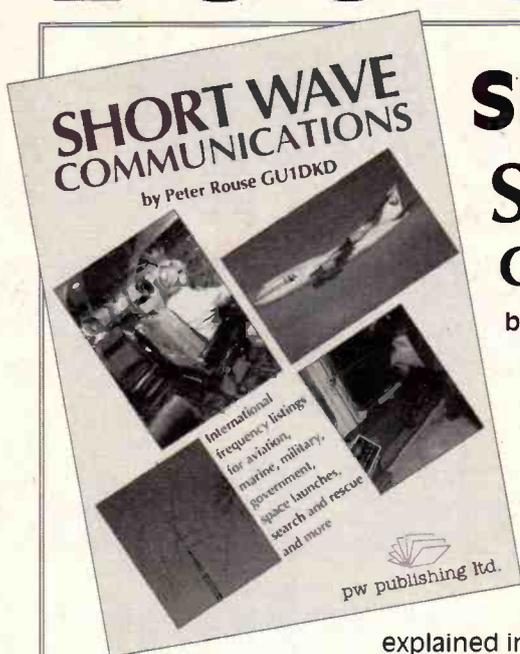
Regarding the quality of reproduction, on conventional speech or music stations it is clear and crisp, and with the 50L6GT able to deliver in excess of 2W it is of more than ample volume for normal purposes. It is delivered by a 5in loudspeaker mounted horizontally at the top of the cabinet, but the output can be switched to earphone terminals provided at the rear of the chassis. There is also another small front-mounted control, matching that for the b.f.o., which mutes the set if desired by disconnecting the cathode resistor of the i.f. amplifier from the h.t.-line.

Obviously, a receiver with such a modest specification as the S38D cannot match the performance of large, multi-valved sets, but the fact that it does perform so well in relation to its size endows it with a high satisfaction factor, which may well be more important to some people. It has certainly been a great pleasure to restore it to this condition.

Abbreviations

A	amperes
a.c.	alternating current
a.f.	audio frequency
a.v.c.	automatic volume control
b.f.o.	beat frequency oscillator
d.c.	direct current
h.t.	high tension
i.f.	intermediate frequency
kHz	kilohertz
kW	kilowatts
mA	milliamperes
MHz	megahertz
mW	milliwatts
r.f.	radio frequency
s.s.b.	single sideband
V	volts
W	watts
μ F	microfarads
Ω	ohms

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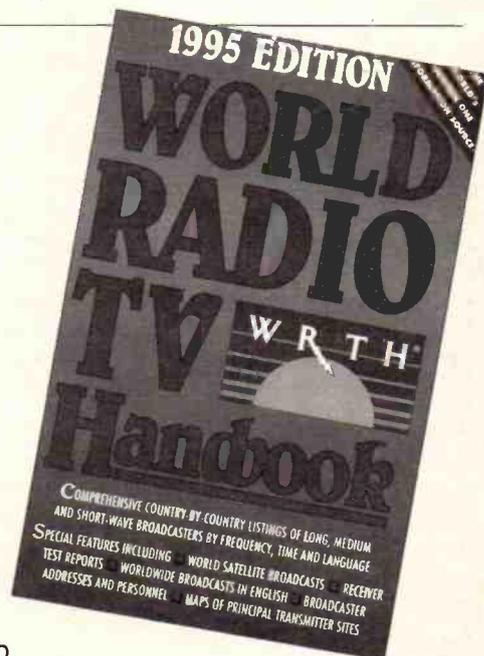
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Damp Finger

A Solid State Alternative

Bill Wilson, tired of tracing elusive faults, comes up with an up-to-date solution for the problem of dead gear in the form of a signal injector/tracer combo.

So your radio or amplifier goes phut, or the one you've just built plays dead. How do you find out easily and quickly exactly where the fault lies? The traditional unrefined low-tech 'damp finger' test is OK, but it doesn't give much idea of the actual amplification taking place, or where any distortion may be originating. (This 'test' is a leftover from valve days,

when, to prove that an amplifying stage was indeed working, a moistened finger dabbed on to the easily accessible top cap (grid) of a valve would act as an antenna and all kinds of induced noise - r.f., 50Hz, the lot - would be amplified and, provided all following stages of the equipment were functioning, all this noise would appear at the speaker as audible proof of this).

The signal tracer and signal injector described

here should put an end to these uncertainties; one can use the tracer with a receiver to listen for a signal right at the antenna and then trace the same signal at subsequent stages until the faulty stage is reached (denoted by no output from the tracer) - or the signal injector can be used as a signal source to inject its a.f./r.f. source into the audio stages of the equipment, and then, by working backwards towards its input, the faulty stage is quickly identified by its lack of response to the treatment. By using the tracer/injector, one can usually quickly identify the faulty stage in the equipment provided that the signal path is reasonably apparent.

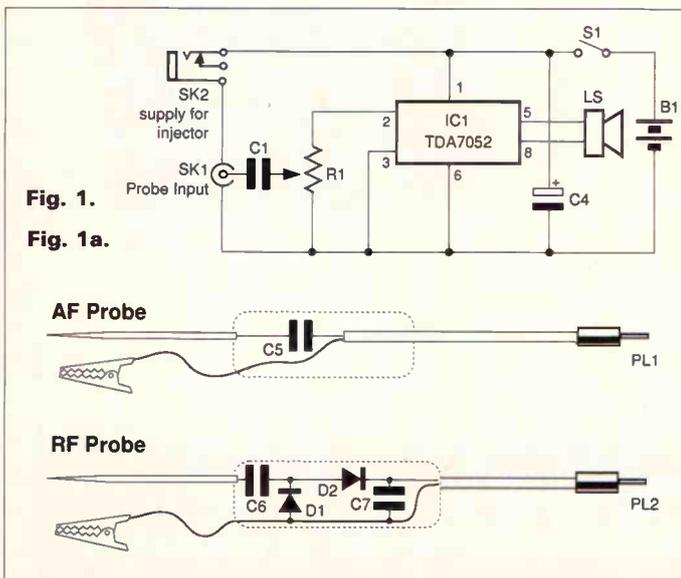
The signal tracer, **Fig. 1**, is nothing more than a good quality audio amplifier and speaker mounted in a small box provided with an input socket to accept either of the two probes, shown in **Fig. 1a**, one for a.f., the other for detecting r.f. signals. (Stick a tuned circuit with antenna across the r.f. probe and,

Hey Presto! you have a radio). A second socket is provided so that the signal injector can steal its power from the tracer.

The injector circuit, **Fig. 3** itself is just the old boring basic square wave multivibrator operating around 1kHz, but its harmonics are still quite evident up to almost 100MHz, so it can be used for 'brute-testing' all kinds of amplifiers and receivers. A small microswitch provides 'press-to-test' operation.

Construction

I employed a scrap pocket 'trannie' as the basis of the tracer, but any small plastics box which will accommodate a small speaker, volume control and two sockets will do the trick. There is nothing magical about the specified i.c., there are various other suitable low standby current i.c.s available, but the specified one is dead easy to use. **Fig. 2** shows the tracer circuit using the equally



You Will Need

Resistors

Carbon film, 5%, 0.25W

5.6k Ω 2 R1,4
100k Ω 2 R2,3

Potentiometers

Carbon track

100k Ω 1 R5

Capacitors

Ceramic (see text)

1nF 3 C6,7,8
10nF 3 C9,10,11
0.1 μ F 2 C1,5

Electrolytic 16V

100 μ F 3 C2,3,4

Semiconductors

Diodes

OA91 2 D1,2

Transistors

BC108 2 Tr1,2

Integrated circuits

ULN2283B (see text) 1 IC1

Miscellaneous

Phono socket; 3.5mm Jack socket; 3.5mm Jack plug;
Phono plugs; Min. toggle switch 1p 2w; 1p 2w
Microswitch; Battery 9V PP3; Speaker 8 Ω , 75mm dia.

suitable TDA7052 amplifier. The two probes are built into empty felt pen barrels, using screened cable to make the leads that plug into the tracer.

Referring to **Fig. 4**, you will see one method used to build the injector, the case consisting of a discarded 'Highlighter' pen, the probe tip being made from 14 or 16s.w.g. hard copper wire filed to a sharp point and sleeved for most of its length. A piece of extra flexible insulated wire terminated with a crocodile clip is used to make the 'earthy' connection to the device being tested and an old Walkman type headphone lead provides a nice flexible 9V d.c. lead.

It is hardly worth showing a layout for the amplifier and probes, they will go on to scraps of stripboard, there being nothing critical about

the construction.

One final point – if you are likely to be working on any valved gear, do make sure that C1, C5, C6 and C8 are at least 300V (or two 160V in series) working types! – things are likely to be less spectacular this way, but it makes life duller and safer... ■

Fig. 4. Suggested construction of the injector probe.

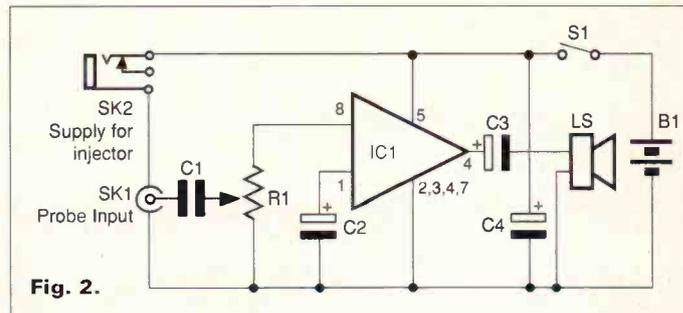
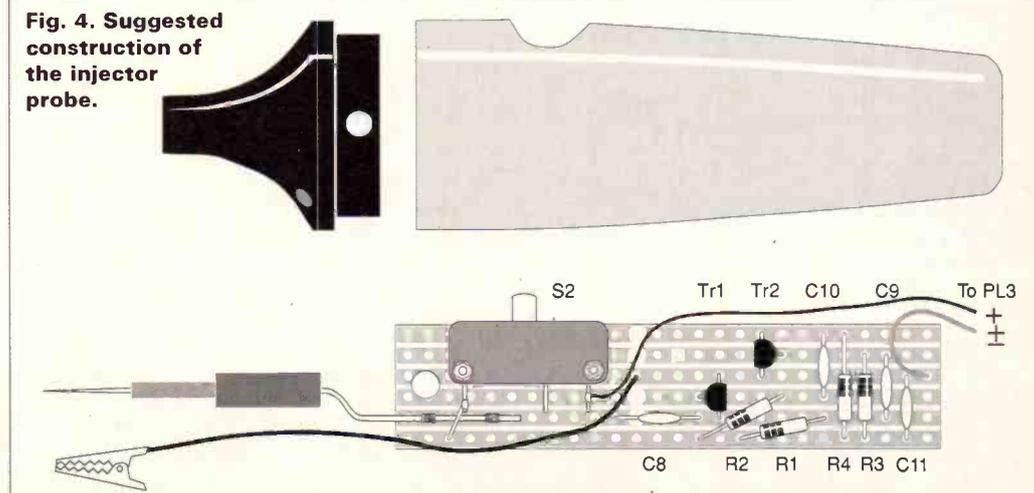
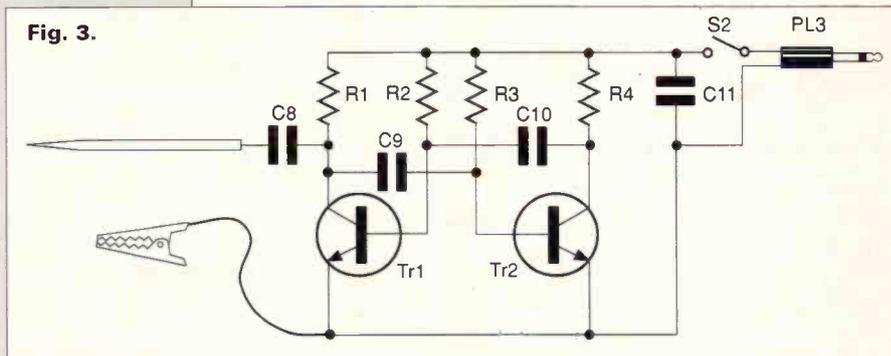


Fig. 2.

Fig. 3.



Abbreviations

a.c.	alternating current
a.f.	audio frequency
a.m.	amplitude modulation
d.c.	direct current
dB	decibel
Hz	hertz
i.f.	Intermediate frequency
kHz	kilohertz
k Ω	kilohm
MHz	megahertz
mV	millivolt
mW	milliwatt
n.b.f.m.	narrow band frequency modulation
r.f.	radio frequency
V	volts
W	watts
w.b.f.m.	wide band frequency modulation
Ω	ohms

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08.00-136.995	12.5kHz	a.m.
37.000-224.995	5.0kHz	n.f.m.
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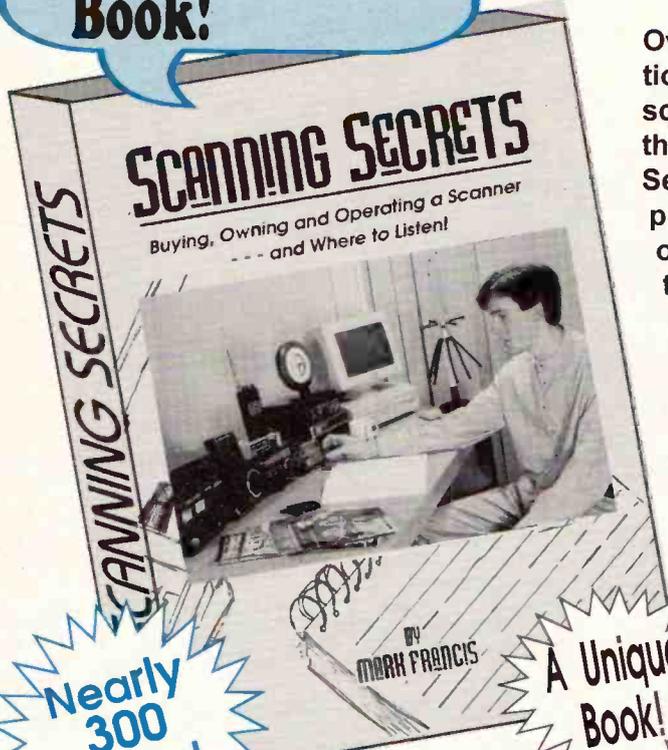
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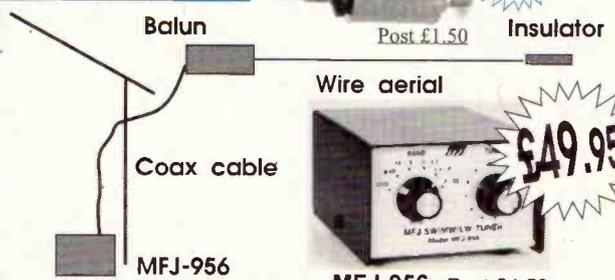
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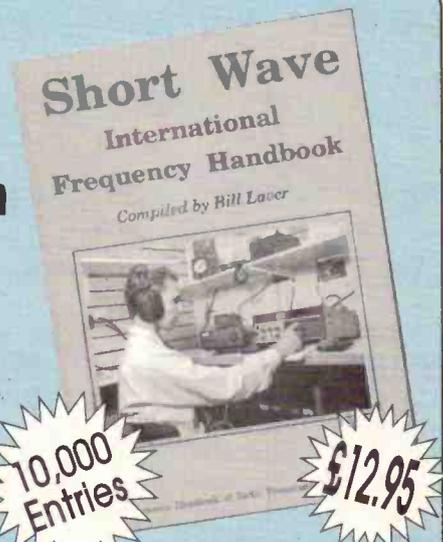
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Angling The Ether

- With Two Hooks

Don Phillips MSc. describes a simple project to enable owners of more than one receiver to simultaneously monitor both.

Things always seem to happen at the same time for the short wave listener. You can spend a quarter of an hour patiently sitting out a strident recital of the Beijing Opera waiting for a positive identification, knowing that you could be listening to what sounds like a news broadcast in a minor dialect on a previously unrecorded frequency. At the top of the hour, however, you are sure you will hear an identification. 'If only', you find yourself saying, 'I could listen to my other receiver at the same time, I could listen out on both frequencies, and maybe make two catches'.

Two Solutions

One solution is to switch both receivers on, turn up each volume control to about half way, and sit facing loudspeakers, and try to make some sense of the jumbled sound that emerges. The other solution is to construct the small project described in this article.

The diagram, **Fig. 1**, shows the wiring and suggested layout of a small unit which allows the normal output from each receiver to be heard in each ear of stereo headphones. With 'one station in each ear' it's possible, with very little practice, to listen to two broadcasts

simultaneously.

By utilising the switching facility on standard quarter inch jack sockets, the circuit has been configured in such a way that when the input to the box from one receiver is withdrawn, (ie. unplugged), the other receiver delivers its output to both earphone channels in the normal way.

Simple Construction

The layout and construction quality need be only as good as the constructor wishes. All components are easily available, many readers will be able to complete the project by drawing on the contents of the inevitable electrical junk box that accrues with time.

The project could be constructed in a small sandwich box, or by using one of the many commercially available project boxes. Because the audio signals entering the unit are of a relatively high level and impedances are low, there is no need for the construction to be electrically screened, nor need the connecting cables be shielded.

Screening would, however, be a wise precaution if the receivers are to be used near a computer or other electrically noisy source, to reduce the likelihood of unwanted signals entering the receivers.

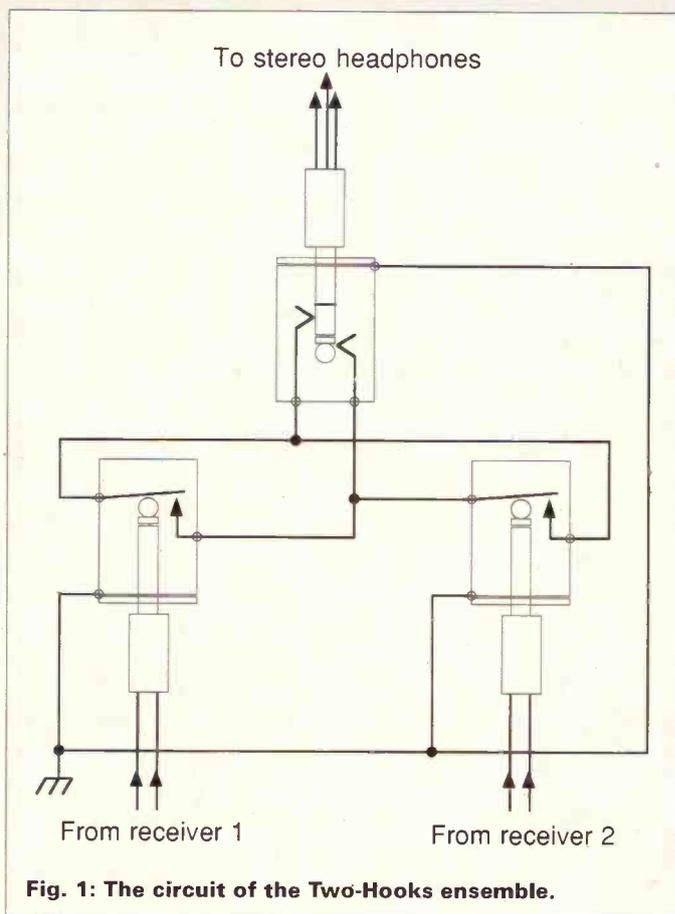


Fig. 1: The circuit of the Two-Hooks ensemble.

Easy To Use

Connect up the two receivers as shown. Their own loudspeaker output should then be muted. For testing purposes, tune each receiver into a different known station and turn the volume up just a little until each appears to be about the same level in each ear.

It's advisable to reduce the receiver volume right down before inserting or removing its connecting lead from the box. This is because as the jack plug is removed its tip will be momentarily earthed, at a high volume level this could damage the receiver

output stages.

As well as allowing the user to monitor two stations simultaneously, this unit offers more specialised options, particularly to the broadcast band listener.

I found the unit very helpful when monitoring two outlets of the same station, namely 'The Voice of the Broad Masses of Eritrea' at the time of that country's independence. Frequencies of 7.020, 7.380MHz were called up on different receivers, but both channels suffered a moderate degree of interference.

However, with a

different outlet at each ear, a central comprehensible image was perceived leaving different interference at the left and right of the sound stage. ECSS listeners (Exalted Carrier Single Sideband - treating an a.m. signal as if it were s.s.b.) can adjust each receiver to receive each sideband of a single amplitude modulation station, thereby achieving the same effect.

It's also possible to hear the delay between primary transmitters and their more distant relays. By tuning

into each, a strange echo is perceived, indicating the real time delay as the programme is fed, probably by satellite. ■

You Will Need

The following items are needed to construct the unit:

For the switching box:

- 2 x 1/4in mono jack sockets (switching type).
- 1 x 1/4in stereo jack socket (switching not necessary).
- 1 suitable box, suggested size approximately 100 x 100 x 50mm (plastics or metal - see text).
- 4 self-adhesive feet.
- connecting wire, solder.

For the connecting leads:

- 2 lengths of audio cable (preferably screened) to run from each receiver to the switching box.
- 4 x 1/4in jack plugs (for each end of the connecting cables).

Also required:

- 1 pair of stereo headphones terminating in a 1/4in stereo jack plug (or use a suitable adapter).

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Jack Ballard Hum G5UM 1910 - 1995



The archives of Amateur Radio are stacked with the contributions and achievements of many individuals. However, Jack Ballard Hum G5UM, who died in January 1995, must surely rank as one of the leading v.h.f./u.h.f. amateur radio pioneers in the United Kingdom.

Jack Hum's connection with *Short Wave Magazine* goes back to just after the Second World War - May 1946 to be precise with an article on 'Tidy Paperwork'. But he will probably be best remembered for his famous receiver design using the versatile Mullard EF50 valve, published in August 1946.

First licensed in 1927, Jack worked on some 'self oscillating crystal' experiments in conjunction with Louis Varney G5RV of antenna fame. Jack said in later years that he often thought - with benefit of hindsight - that they had probably stumbled on the transistor without ever realising it!

The 1930s was a time of great discoveries and developments on v.h.f. and u.h.f. Jack was kept busy in his chosen career as a specialist technical journalist and like many others, Jack was drawn to experimental work on 5 and later 2.5 metres, having first been attracted by the mysterious goings on from the BBC's Alexandra Palace on 7 metres.

Valve Based

Of course, all v.h.f. operation in the 1930s was valve based. In fact, Jack often said that there was a conflict of terms because the valves didn't have bases.

When Jack G5UM was featured in the *Practical Wireless* 'Radio Personality' in October 1993, he frankly admitted that the valves had to be de-based to get them to work at v.h.f. De-basing was difficult, requiring the connecting pins to be de-

soldered and the Bakelite end caps worked loose before removal. The delicate lead-in wires were then connected directly into the circuit.

In the early days Jack recalled that self-excited oscillators were the norm. They were often modulated by a carbon microphone, while the receiving side was provided by a super-regenerative 'swoosh box' receiver.

Airborne Radar

During the Second World War Jack Hum took his amateur radio experience with him to his new work on Royal Air Force Coastal Command airborne radar. Jack said that "The advances that had been made by secret development work in industry to produce, on a quantity basis, transmitter-receivers operating on hitherto 'impossible' frequencies around 200MHz made much pre-war experiment look, well, amateurish!"

The wonder valve used in that equipment was the EF50 r.f. pentode. This remarkable 'baseless' valve was employed as r.f. amplifier, mixer, signal and time-base generator.

After the War, fascinated by the potential of the EF50, Jack designed the now famous 'All EF50 TRF Receiver'. This set used a simple three-valve circuit of r.f. stage, regenerative detector and an audio amplifier working into headphones.

Short Wave Magazine

After its publication in *Short Wave Magazine* in August 1946, the 'All EF50' receiver

was widely built by readers. It was also copied by sundry other journals around the world, often with no acknowledgement as to the source or author!

After the War, the amateur movement gradually received its frequency allocations back - slightly amended. Of these, in a v.h.f. context, the new 144MHz band was the most important.

There were no repeaters in those days and most people used home-built equipment using crystal control. There were few variable frequency drive sources available. With crystal controlled transmitters, operators had to call and then announce they were tuning. Those were the days of 'tuning from high to low'!

Then came an ingenious suggestion from the late Austin Forsyth G6FO, Editor of *Short Wave Magazine*. "Divide the realm into geographic frequency segments so that operators need to tune only to the segments into which they wish to communicate." Thus was the born the first bandplan.

The G6FO idea immediately caught on and was duly recognised by the RSGB. And in subsequent years it has been honed to its present degree of efficiency and acceptability.

High Frequency Orientated

During the late 1950s, the RSGB's thinking was h.f. orientated. Suddenly, as the result of an annual council election the RSGB found itself with six or so new council members keen to promote

v.h.f. - and among them was G5UM.

From the new thinking, there sprang many ideas. These included v.h.f. contests, and a new VHF Field Day to complement the traditional HF Field day, introduced in 1932.

A v.h.f. feature was started in the RSGB's *Bulletin* magazine, and proficiency awards introduced. The now familiar annual VHF Convention was also introduced.

In all of the new enterprises G5UM found himself increasingly involved. He was Committee Secretary, writer of the v.h.f. feature and VHF/UHF Awards Manager. However, in the 1970s the onset of heart problems compelled him to pass these duties on to his successors.

Vice President

Both Jack 'Uncle Mike' and his wife Grace took particular pleasure when in 1974 he was created a Vice President of the RSGB. This was in recognition for services to v.h.f.

But, now that the v.h.f. 'voice on the hill' from the delightfully named Leicestershire Wolds village of Houghton-on-the Hill has been silenced, we can remember his last words in the *Practical Wireless* 'Radio Personality' feature of October 1993.

Rounding off the page Jack G5UM advised that we should "Relax from the pleasures of life, go into your shack and indulge in a little radiotherapy. It'll do you the world of good!"

Rob Mannion G3XFD



Scouting Around The Optoelectronics Scout

Kevin Nice looks at an intriguing counter come data-logger from the company that, for the past twenty years has been producing innovative products such as the Interceptor. Their latest offering is the Scout, a small pocket sized unit.

The ability to monitor a wide range of frequencies and record them for later is an invaluable possibility for the scanning enthusiast. There are some potential users of this equipment that would insist on this capability - they are not necessarily current or potential readers of *SWM* though as their activities and motives are questionable.

Not a Frequency Counter

The manual supplied with the Scout tells us that the unit is not a frequency counter in the traditional sense, because it is not intended as a measurement tool, instead, the device is designed to be used with an antenna - the one supplied is a highly flexible helical affair - to receive radio transmissions, and record their frequencies, it is then is a frequency recorder. The

memory configuration is such that 250 captures can be stored in each of the 50 locations.

Use of signal processing techniques provided by the embedded microprocessor allows the unit to evaluate the incoming signal and statistically to determine when a specific frequency is dominant, i.e. when a signal is 10-20dB stronger than any other signal or the r.f. noise floor. The counter circuitry then produces a stable count.

Computer Control

Those of you with an Icom IC-R7100 receiver will

probably be familiar with the CI-V interface. This interface is a serial bi-directional system that uses two wire connections. Signal levels are t.t.l. There is a 2.5mm jack socket on the top panel to facilitate interconnection to other equipment. Optoelectronics have provided four possible address combinations, which are selected by two internal jumpers, this facility is provided so that the user can connect up to **four** separate Scouts to one receiver or host computer! When the Scout is operating in FILTER, CAPTURE or RECALL mode it automatically transmits

tuning commands to the CI-V interface equipped receiver, as the incoming signals are captured or as memories on the Scout are recalled.

In order to connect the Scout to a personal computer an external interface is required to convert the t.t.l. levels to RS-232C. Once connected the Scout responds to a variety of interrogation commands. Optoelectronics produce such an interface, the CX12 which is supplied with logging software. We hope to cover the use of this next month as it wasn't available for this issue.

Power Supply

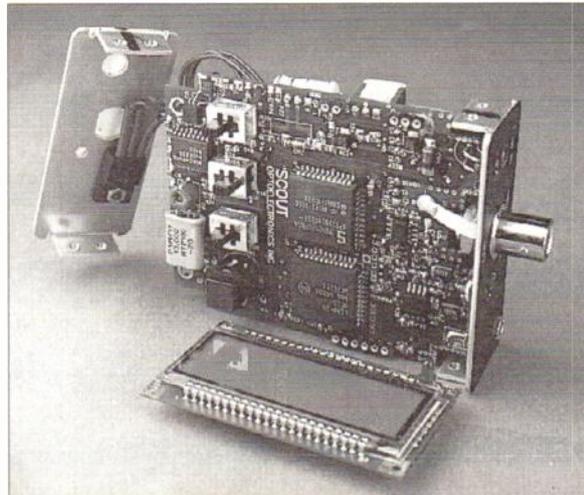
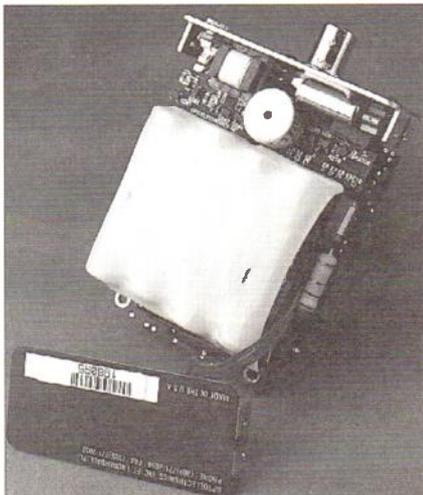
The Scout contains a high capacity NiCad pack, and comes complete with an external charger/p.s.u. The unit has a rapid charge facility which allows full power in two hours, this facility is intelligent as the cell voltage is monitored. If the NiCad pack is totally exhausted it is first trickled charged until the battery voltage is up to the minimum, then the charge rate is increased. When fully charged, the rate resumes to trickle, where it remains until the charge voltage is removed and re-applied.

In Use

There are four modes of operation, these are NORMAL, FILTER, CAPTURE and RECALL. Looking briefly at the mode, firstly NORMAL mode,

Specifications

Frequency Range:	1MHz-2.8GHz
Antenna/Input Impedance:	50Ω BNC
Power Supply:	Internal NiCads or 9-12Vd.c. 1.2A max. (Supplied)
Display:	10-digit l.c.d. backlit
Warning Device	Audible beep or vibrator
Dimensions:	67 x 45 x 97 (w x d x h)
Weight:	250g



frequency measurements are made continuously. Captured frequencies are displayed on the l.c.d. display. On capture of a new frequency one of two warning devices are activated, either the beeper, or for a more discrete warning the vibrator. If the beep is selected then the display backlight is also illuminated for ten seconds.

Selecting FILTER mode reduces random counting, noise and false signal detection. A digital filtering algorithm is applied to incoming signals, only those signals which pass

the algorithm are stored and displayed. Gate settings are selected as in the NORMAL mode of operation.

CAPTURE automatically selects the 1kHz gate setting. Incoming signals are displayed and stored in up to 50 unique memories, then up to 255 occurrences of each are also recorded by the Scout. The count is incremented each time the unit registers a transition of a carrier. When capture mode is selected and a receiver is connected via the CI-V interface the Scout will tune the receiver to the captured frequency.

RECALL mode, is self explanatory, it disables the frequency measurements but does not prevent the signal strength meter from operating. Memories are integrated, this is done by depressing the Gate button, the frequency captured is displayed as is the number of captures, a zero displayed for the number of captures indicates that a memory location is unused.

The overall performance of the scout is dependant on tuning of the front end, due to its wideband input. This means that the addition of some pre-

selector circuitry will be beneficial when using the unit for specific bands.

Many thanks to **Waters and Stanton, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835, Fax: (01702) 205843** for the loan of the Scout. The Scout costs **£399.00** inc. VAT.



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Tuning is performed by direct entry, rotary control autoscans, manual scan or memory. The receiver has 45 memory presets in total, nine on f.m, l.w. and m.w. with a further eighteen on s.w.

Modes available are s.s.b., c.w., a.m. (wide and narrow) and f.m. stereo when used with headphones (v.h.f. only).

The Sangean 818 features an alarm clock with dual time facility, sleep and snooze are also included.

The receiver requires four 'D' cells, and three 'AA' cells for the clock. An optional mains power supply is available.

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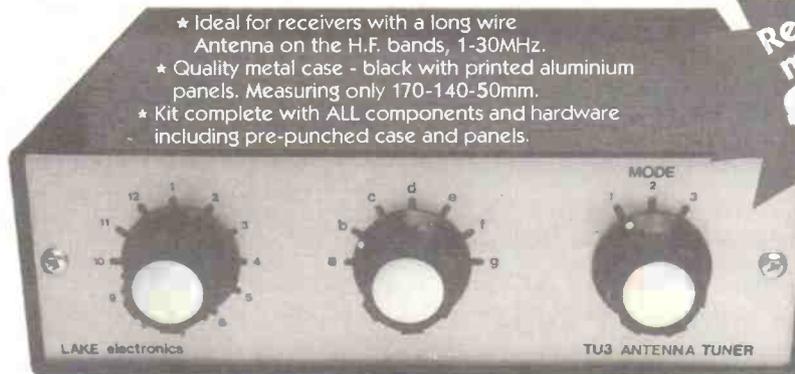
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NEW!!

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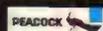
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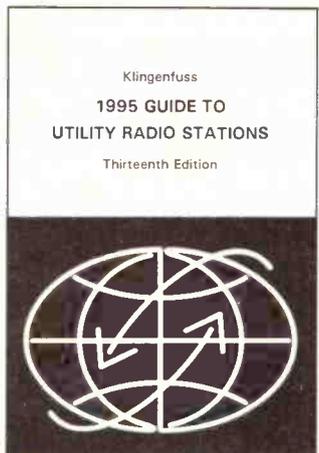
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Radio Secrets of the War - Part 1

The Wartime

Radio Operators

In the first part of this new series, David White takes an interesting look back at the invaluable aid provided by the use of radio, during the Second World War.

In the immediate years leading to the outbreak of war in 1939, a few far sighted individuals almost on their own, practically ensured that we were not caught with our pants down. The decision to build the Spitfire in sufficient quantities to ensure that we had at least a decent chance of holding our own in any eventualities, and along with the deployment of the newly invented Radar was seen to be one of the better decisions of the British authorities.

Early Warning Radar

This also applied to radio communications where v.h.f. radio experimental contacts between aircraft by radio amateurs in 1933 was seen to be an essential requirement in the use of early warning radar and short range ground to aircraft radio. During the First World War, it had been realised that listening in to enemy radio communications had given us a great deal of intelligence, so naturally

great priority was given to expanding the existing radio monitoring services.

This was known as the Y service, which was set up to intercept all enemy radio transmissions. In 1938 it was decided to locate the

massive expansion of the radio services of all types was undertaken. As America had not yet entered the war they supplied the British with vast quantities of radio communications equipment

Cheadle near Manchester, Forest Moor near Harrogate and Irton Moor near Scarborough.

Stations in Scotland were located at Brora, Montrose and Cupar. As the war progressed, the RAF Y stations were generally expanded, covering the low, medium, high and v.h.f. bands and feeder stations going under the disguised name of Home Defence Units (HDU) were set up at Gorleston, Hawkinge, Beachy Head and Strete in Devon and a small van at Fairlight in Hastings. All of these stations were monitoring Radio Telephony (R/T) from the German fighter and bomber pilots as the Germans swept towards France and prepared for the invasion of Britain.

Plain German

As more plain language German transmissions were heard, it was soon realised that hardly anyone could understand German, so a hasty programme of getting German speaking WAAF girls sent to these stations was instigated. When



A very good example of the trusty AR88D from RCA. This one, however, features a digital frequency display definitely not from WWII!

Government Code and Cypher School (GCCS) out of London to Bletchley Park, a country mansion located in north Buckinghamshire.

The Army, Navy and Airforce Y intercept stations throughout the country were fitted up with a landline teleprinter system which all fed into Bletchley Park so that all intercepted messages could be passed to GCCS without any delay for decryption.

During 1939 and 1940 a

of all types, which as of yet they had no need.

The largest quantity was of the American HRO, a high frequency receiver of quality and performance and v.h.f. receiver made by Hallicrafters called the S27. Initially, Radio Y stations were set up at Shaftesbury in Dorset, Flowerdown near Winchester, Hawkinge near Folkestone, Chicksands near Bedford, Beaumanor Park in Leicestershire, Waddington in Lincolnshire,

The Wartime Radio Operators

daylight attacks on Kent in the summer of 1940 increased, the main Y station at Hawkinge was moved to West Kingsdown on the north Kentish Downs and still concentrated on listening to voice transmissions on medium, high and v.h.f. frequencies, but the main Y stations at Cheadle and Chicksands concentrated on Wireless Telegraphy (W/T or Morse). Cheadle was the RAF headquarters of the Y Service.

The Navy Y stations at Flowerdown and Scarborough were mainly concerned with Naval military W/T, but other smaller stations around the coast were listening in to the fast German E-boat messages. A typical example of operations would be at Fairlight where two of the Hallicrafter S27 receivers would be used for listening to the German pilots talking to each other or to their base stations with the operators having one or two German speaking WAAFs to translate what the pilots were saying and everytime one of the pilots said that another British fighter was shot down, we would inform our own rescue services immediately to try and pick up the pilot before the German rescue services got him.

Every day, logs of the day's events were sent by despatch rider to the Air Ministry Intelligence where they were quickly passed onto station X at Bletchley Park. Much of the monitored traffic gave valuable information on the location of German army and air force units as well as our own lost units which had become detached from the main body of troops in the retreat through France.

As more and more enemy transmissions came on the air, many extra radio direction finding stations were set up in order to locate

The ubiquitous HRO, with its removable coil bank band change, a true classic amongst its peers!

them. A large medium frequency radio direction finding station had been set up at Sutton Valence in Kent using the Adcock system of four vertical antennas, these were useful for listening to the German aircraft navigation system of radio beacons which were used to guide their aircraft back home after a raid.

They used a Lorenz system of navigation as well as the homing beacons, but seemed singularly untrained in astro navigation unlike all British pilots. Later on h.f. direction finding was added with quite a large reception section taking German air traffic and finally v.h.f. direction finding was added.

This station was also linked to Cheadle which had many teleprinter lines running into Bletchley Park. In fact, as the height of the war, Bletchley had well over 100 teleprinter lines running into it from all the Y stations located around the country.

The smaller units used despatch riders and at times, up to 40 riders an hour were going through the gates at Bletchley Park. The German speaking WAAFs at Sutton Valence not only took a d.f. fix on the German fighters, but at times would speak back to them giving misleading information.

The receivers here were mainly HRO and a few Marconi and Eddystone receivers, later in the war these were supplemented by the large RCA AR88 receivers. All the information was passed to Cheadle by Post Office sounder over the teleprinter lines, as it was quicker and did not interfere with the receivers.

The Army had a huge Y station at Beaumanor Park and along with Forest Moor was listening to all the Wermacht Wireless Telegraphy and again everything the Army girls heard was passed straight away to the teleprinter room and immediately passed to station X at Bletchley Park, which had at its peak of operation employed 12000 people working on decryption of coded messages.

Although the Y stations were performing as a joint service organisation, they were mainly concerned with listening to the German navy army and air force traffic, but the German intelligence network expanded as more countries were occupied, so it was decided to set up a special unit to deal with this and in October 1941, Special Communications Unit Nr 3 was set up at Forfar in Scotland and Hanslope Park

in North Buckinghamshire using almost exclusively radio amateurs who were already skilled in listening into weak signals using Morse code.

Wrong Hand Salute

They were all civilians who were told to put on army uniforms but they were all easily recognisable by the fact that they wore their equipment incorrectly or saluted with the wrong hand!

These also used small direction finding units located nearby using the Adcock system and all the W/T bay were connected by a microphone to these d.f. stations. The main d.f. stations were located in Cornwall at St Erth, Belfast, at Gilnahirk and at Thurso in Scotland, and using the Adcock system were spaced so far apart to ensure the maximum of accuracy on triangulation when locating ground and sky-wave transmissions.

The Bellini-Tosi system of medium frequency crossed loops as seen at most civil airports before the war was really only effective during the day because at night the signals were reflected from the ionosphere thus causing great inaccuracy.



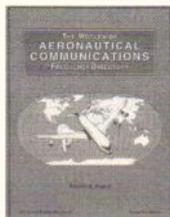
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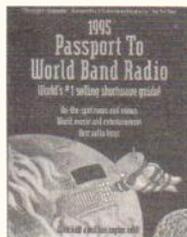
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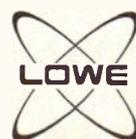
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Long before the war started, there was already in place systems of radio d.f. in the UK, Germany and other countries. These were run by the Post Office, but in 1939 great importance was attached to finding enemy transmission, not only from Germany, but also from within the UK itself, in case they were used to guide in enemy bombers. These d.f. stations were supplemented by mobile direction finding vehicles which ensured that every part of the UK was covered, even to within a few yards.

Three Hundred Receivers

The German d.f. system was set up in France in 1942 and the HQ for this was located in Avenue Foch in Paris. This consisted of 300 Telefunken receivers connected to 300 cathode ray viewing screens which were graduated with an accurate frequency read out. Each screen had its own operator, and as soon as radio transmission took place, it was immediately detected and a display was seen on the face of the c.r.t. screen.

The frequency was quickly read off and a telephone alert would go out to the main direction finding stations which were located at Brest in western France and Nuremberg and Augsburg in Germany. Where all three angles of direction crossed each other, gave an accuracy of eight to ten miles in a triangular formation. The main d.f. station would then alert three of the nearest mobile direction finding vehicles who would aim at the area located by the main d.f. stations.

The mobile d.f. stations would then take their own position fixes of the unidentified transmission, which would then be



The R1155/T1154 combination. The receiver is on top, along with the 'J' aerial switch (round object on top) and 'bathtub' Morse key. This was complete with locking ring that would hold set on transmit while aircrew bailed out of a stricken aircraft.

located to within 1500 metres or less. The Germans of course had their own Y service and this was known as HORCHDIENST and their main training centre was at Halle-an-der-Salle and at their own monitoring centres the receivers that were mainly in use were made by Telefunken, but they also used a fairly good copy of the HRO as well.

The German Y service was also very efficient and they made good use of listening to the Allied signals, but were never quite in the happy position of having one of our own code enciphering machines to assist them in breaking our codes. At all the Luftwaffe message encoding centres there was a large notice for all to see which read DER FEIND HOERT MIT which translates to THE ENEMY IS LISTENING - not that either side needed reminding of this!

Navigation Beacons

Before and during the war, the Germans had in place an extensive system of medium and low frequency radio navigation beacons.

These beacons had their own call signs and transmitted Morse code identification which was essential to their military and civil aircraft. In fact, it was an essential item of navigation for the German bombers when they were returning from a raid over England.

By the beginning on 1940, there were 46 radio navigation beacons located at various places in Germany and another 38 of them in the occupied countries and all of them operated in the 176 to 580kHz band. It was soon realised that something ought to be done about these beacons and other strange secret transmissions which were starting to come to light.

Accordingly, a Wireless Intelligence Development Unit (WIDU) was hastily formed on June 18 1940 and along with the Special Nr 80 Wing which had been formed to listen for some suspected beam transmissions was amalgamated on October 14 1940. It was found that short of actually trying to bomb these beacons, which was impractical, the best way of rendering them useless was to listen to

them and re-radiate the beacon signal.

A system of fake beacons was set up throughout the UK and these were known as Meacons (short for Masking Beacon) and Nr 80 wing of the RAF in conjunction with the Post Office radio transmitters would re-radiate the German beacon using the same call sign, but of course, it was much stronger in the UK and would mask the original beacon in France or Germany.

In the middle of August 1940, we had nine of these masking beacons transmitting and the success of this jamming system really became apparent on the night of November 5-6 1940 when a raiding Heinkel bomber of KG26 group was attempting to locate his position by taking a fix on the St Malo beacon in France.

In fact he was listening to the fake beacon in Britain, so that when the aircraft passed right over the top of the beacon it rightly assumed they were well into southern Brittany, but when they broke out of the cloud base found they were still over the sea and thought the aircraft was actually over the Bay of Biscay but running short of petrol decided to land on the beach of the coastline ahead. The crew were mortified to find they had landed on a Dorset beach.

Another Dornier bomber had earlier followed one of the beacons and had landed safely at what he thought was his home aerodrome only to find British soldiers greeting them with pointed rifles. Much to their consternation, they had actually landed at Lydd aerodrome in Kent! This was the beginning of undermining the confidence of the German pilots in their electronic navigation systems. ■

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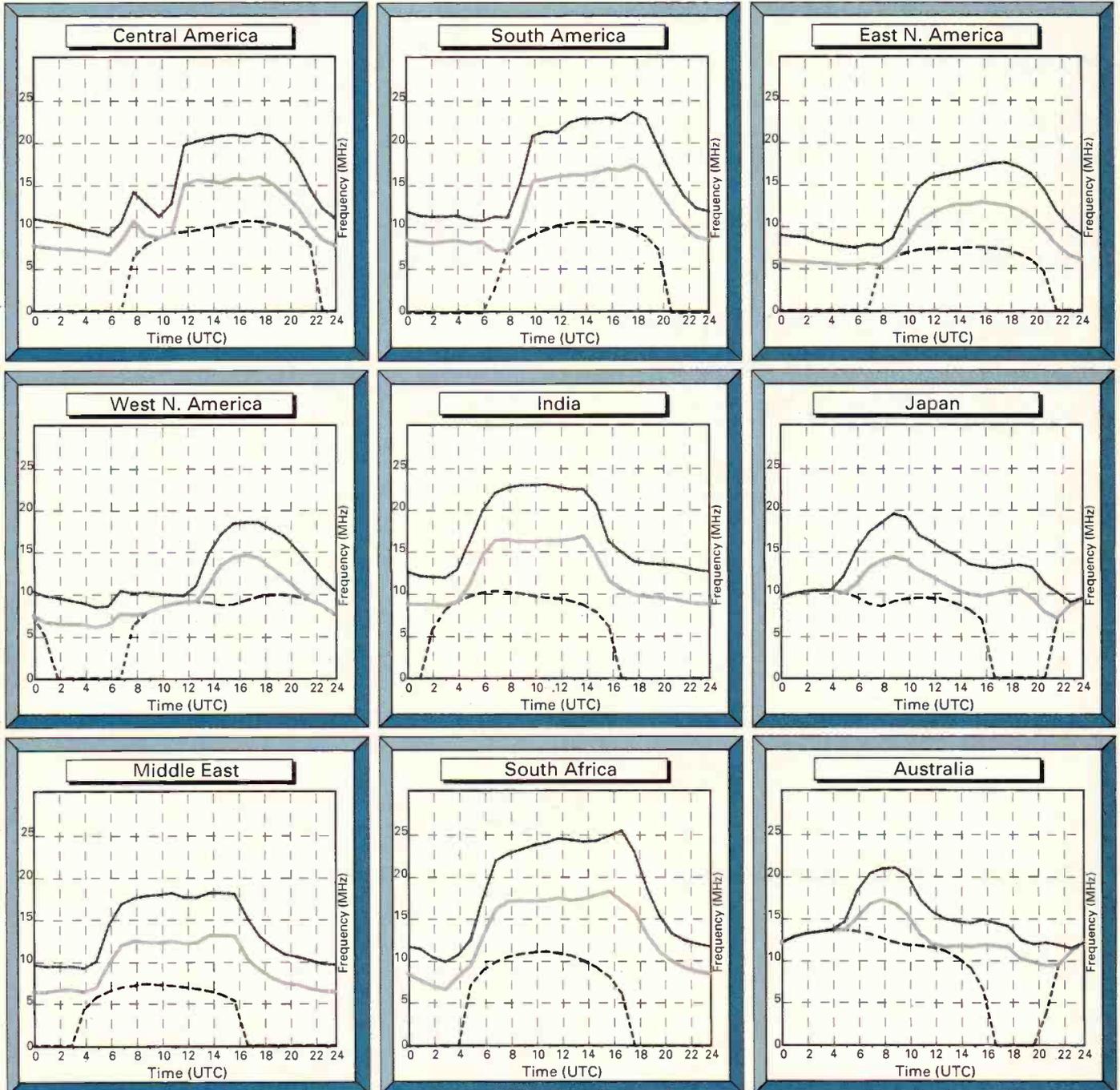
The **NEW AR2700 UK** receiver is the very latest high-tech hand held receiver from AOR. Frequency coverage is 500 kHz - 1300 MHz with receive modes of NFM, WFM & AM. A large LCD with three way rear illumination provides all operational details. An optional **VOICE RECORD** chip RU2700 permits an **instant 20s digital recording off air** which may be replayed over and over again. Computer control is also possible by using the optional IF-ADP and CU8232 adaptor and interface unit.

Model	AR8000	AR2700
Frequency range	500 kHz - 1900 MHz no gaps	500 kHz - 1300 MHz no gaps
Receive modes	NFM, WFM, AM, USB, LSB & CW	NFM, WFM & AM
Frequency step size	50 Hz - 995 kHz in 50 Hz programmable	NFM & AM 5kHz, 6.25kHz, 9kHz, 12.5kHz, 20kHz, 25kHz, 30kHz, 50kHz & 100kHz WFM 50kHz & 100kHz
Number of memories	1000 ch (20 banks x 50 ch)	500 ch (10 banks x 50 ch)
Number of search banks	20	10
Scan/search rate	Approx 30 per second	Approx 30 per second
Number of frequency pass channels	1000 - 50 per search bank	50
Aerial input	50 OHM BNC - helical whip supplied	50 OHM BNC - telescopic whip supplied
AF Output	120mW (8 OHM) 10% THD	110mW (8 OHM) 10% THD
Power requirements	4.8V NiCad, 6V dry cell, external 9 - 16V d.c.	4.8V NiCad, 6V dry cell, external 9 - 16V d.c.
Size (excluding projections)	153mm(H) x 69mm(W) x 40mm(D) approx	153mm(H) x 63mm(W) x 40mm(D) approx
Weight (including NiCads but not aerial)	350 grammes	315 grammes
Priority	YES	YES
Scan/search bank link	YES	YES
Automode	YES - with override	YES - with override
Twin VFO	YES	NO
LCD & keypad illumination	YES	YES
Alphanumeric comments	YES	NO
Bandscope	YES	NO
Sleep timer	NO	YES
Permanent on screen battery indicator	NO	YES
Computer control	YES - with optional CU8232	YES - with optional IF-ADP & CU8232
Voice recording	NO	YES - with optional RU2700
Options	CU8232 interface, SC8000 soft case, EP2000 earphone, (CR8000 tape lead)	IF-ADP & CU8232, SC2700 soft case, EP2000 earphone, RU2700 record IC
Price inc VAT	£426.00	Provisionally £269.00

AOR (UK) LTD, Adam Bede High Tech Centre, Derby Road, Wirksworth, Derbys. DE4 4BG ENGLAND Tel: 01629 825926 Fax: 01629 825927 E&OE All trade marks acknowledged

World Propagation Forecasts March

Circuits to London



How to use the Propagation Charts.

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

success below this frequency are very slim.

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

Lastly, the upper dashed line, represents the maximum usable frequency (MUF) a 50%

probability of success for the path and time.

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

determined by the values of the intersections of the plots against frequency.

Good luck and happy listening.

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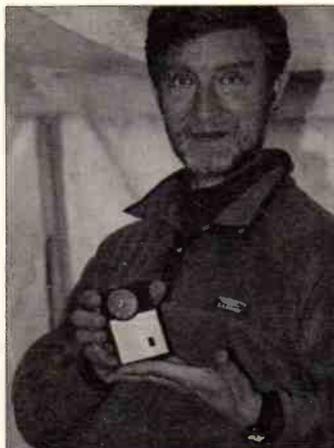
Reflections

A few days before I finalised this column, I had a ten-minute ride on a Tesco service bus and, as the bus reached one of its stops, I noticed a young lady using a mobile phone with about 50mm of antenna just above her ear. She boarded the bus, still chattering, and her conversation continued until we reached our destination. Here was this little hand-set, powered by a small battery, sending and receiving signals despite the undulating route and the variety of metallic obstructions inside the bus.

Anniversary

Preparations are now under-way by many local and national authorities and organisations to celebrate the 50th anniversary of the ending of WWII and, of course, the communications of those days will be under discussion once more. We should not forget that the advent of the transistor and the rapid advance in semi-conductor technology, that made the mobile-phone possible, did not begin until a good 12 years after the war. Therefore all WWII communications were built around the mechanically delicate and current hungry thermionic valve. Young ladies were dropped by parachute into enemy occupied territory with sets like the MCR1. **Fig. 1**, miniature communications receiver and the 'B2' transmitter and receiver built into an attache case. To find out more about these sets in action I suggest that you obtain from your public library a copy of *Secret Warfare* by Pierre Lorain, published by Orbis ISBN 0-85613-586-0.

Fig. 2.



Collectors

Early transistorised portables and novelty receivers are now sought after by collectors. Among them are **Enrico Tedeschi** (Hove) seen in **Fig. 2** holding a Sony TR63 made in 1957/8 and **Bob Smallbone** (Bognor), **Fig. 3**, attempting to 'eat' one of the many novelty sets in his collection. Enrico has at least 25 transistorised sets in his hoard and is currently setting up a wireless museum in the Hove area. Bob is often seen displaying his wide range of vintage domestic sets at various local functions.

Propagation

The wartime wireless operators had their problems with the propagation of signals due to disturbances in the earth's atmosphere. It's on record that in 1942 a British RADAR receiver was blotted out by radio noise from a giant sunspot. Radio wave propagation is a fascinating subject which many radio enthusiasts still study even in today's high-tec world.

Sporadic-E

For instance, **Peter Barber** (Coventry) looking back over the 1994 Sporadic-E season tells me that for him it began on May 1, with programmes from Spain's TVE1 on Chs. E2, 3 and 4 in Band I and ended in mid-September. He found that reception from such countries as CIS, Finland, Iceland, Italy, Norway, Slovakia and Yugoslavia was of lower quality and duration than in previous

Fig. 3.

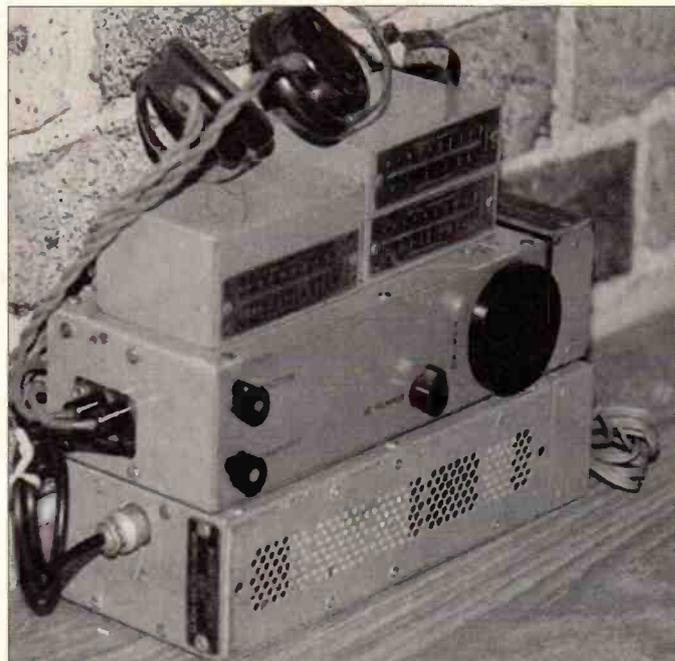
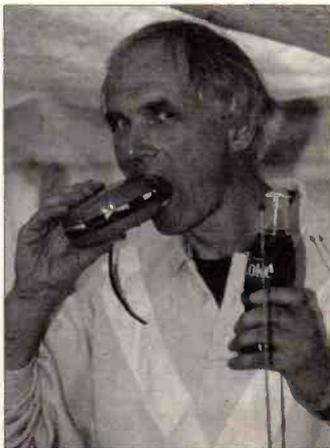


Fig. 1.

Tropospheric

During the mid-October tropo-opening, Peter Barber had 'marvellous reception' from stations in Belgium, Denmark, Germany, Holland and Poland in Band III and from Belgium and Holland in the u.h.f. bands. While high pressure was stationary, from north to south across the low countries, on November 29, Peter received pictures from Belgium on Chs. E3, 8 and 11.

Around 2240 on the 26th, **Richard Gosnell** (Swindon) received pictures from Ireland in Band III. Although only strong enough for monochrome reception he identified RTE 1 from Mullaghanish on Ch. D and RTE 1 and 2 from Mount Leinster on Chs. F and I. Richard heard the sound from RTE 2 (Mullaghanish) by selecting the appropriate frequency on his scanning receiver.

A slight lift on the 28th and 29th produced French and German stations in Band II for **Richard Wood** (Redditch) and, at 2015 on the 28th, pictures from S4C around Ch.42.

With the high pressure following on from the end of November, I managed to pick-up a few more stations that I have not heard before," wrote **Arthur Grainger** from Carstairs Junction. He noticed that this particular tropospheric-opening was over Wales, Ireland and further south because, he logged Radio Cymru (RDS & Radiotext) on 93.5 and 104.3MHz, BBC Radio 4 from the Powys transmitter on 103.8MHz, Tipp FM on 104.0MHz and a very strong signal from Studio Brussels on 102.1MHz.

In the early evening of January 3, **Richard Bell** (Melton Mowbray) caught one of those

short lived tropo-openings that was no doubt due to some form of weather system on the move. The event lasted for about an hour during which time he received u.h.f. television pictures, mainly in black and white, from the transmitters at Belmont, Bilsdale, Sandy Heath and Sutton Coldfield. "It was a rare occurrence to see Tyne Tees TV from Bilsdale," said Richard and explained that usually, when an opening is in progress, a Dutch station appears on Ch.29. He told me that the same happened on Ch.23. Carlton TV usually appears but this time Ch.4 from Bilsdale was predominant.

DX In Finland

One of our overseas readers, **Timo Newton-Syms** (Helsinki), uses a multi-system Nicam Grundig televisor capable of receiving NTSC, PAL and SECAM signals, told me that the set's "tuning features are excellent for weak signal hunting". Although his main interest is satellite TV he keeps an eye open for DX on the terrestrial channels when conditions are right. He has a motorised 1.8m dia. dish for satellite monitoring and a domestic antenna for the u.h.f. band. His house is situated on a hill by the coast and, due to this and good weather conditions, he often receives pictures from Estonia in the u.h.f. band: Early in December he logged near perfect pictures throughout the evening from EVTV on Chs. 29 and 30. At the same time, although not as strong, Timo found pictures from Estonian ETV (with readable Teletext) in Band III on Ch. R11 and several stations in Russia which he could not identify. Next morning he added pictures from Sweden on Chs. E9, 41 and 44. "The South of Finland is relatively flat," said Timo,

which helps when he looks for distant transmitters. His log includes many Finnish transmitters, his local being Espoo some 20km away, plus Sweden's SVT TV4 which relays selected live SVT programmes in coastal areas of Finland for Swedish speaking Finns.

Weather

"This has been a dramatic month," wrote Arthur Grainger at the end of December. He tells me that the weather caused great chaos on the 10th and 11th. It rained for 60 hours from the evening of the 9th to the early hours of the 12th. More than 3.0in fell on the 11th causing tremendous flooding throughout the area. The worst hit were Lanarkshire and Renfrewshire and in particular Glasgow and Paisley. "In this part of Lanarkshire many major roads and nearly all minor roads were closed," said Arthur, who, while driving around the district, found it a "frightening experience to see the water flowing rapidly over the fields that border the rivers and lapping over the bridges that cross them".

In December I recorded 5.63in of rain compared to 8.97in for the same period in 1993. This brings the total for 1994 to 41.99in compared to 47.18in for 1993. The heaviest fall was 1.30in on the 8th and amounts of 0.65in fell on 26th and 27th. The rest was spread across 15 other days between the 3rd and the 30th. The rain was interrupted by frost and

fog with overnight temperatures around 23°F on the 22nd, 23rd and 24th.

The daily variations in atmospheric pressure, **Fig. 4**, for the period November 25 to December 26 were taken at noon and midnight from Arthur Grainger's barometer (dotted trace) in Scotland and the barograph installed at my home in Sussex.

Solar

During December, **Ron Livesey** (Edinburgh), using a 2.5in refractor telescope and a 4.0in projection screen, located four active areas on the sun's disc on the 1st, two on the 6th and one on the 27th, 28th and 29th.

In Selsey, **Patrick Moore** followed the progress of a sunspot chain from the 14th to the 16th, **Fig. 5** and a large single spot from the 20th to the 25th. The sunspot positions in **Fig. 5** were taken from Patrick's projection screen around 1015 on the 15th. The later one was on central meridian on the 25th. In view of the foul December weather it's a wonder that the sun was seen at all.

Auroral

Ron Livesey, the auroral co-ordinator for the British Astronomical Association received reports described as 'glow or patch' for the

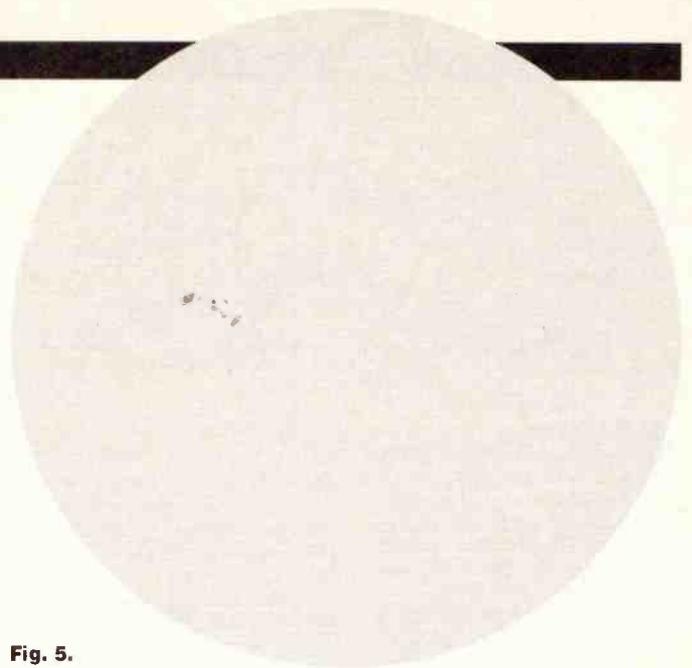


Fig. 5.

overnight periods on December 1/2, 26/27 and 27/28, 'homogeneous arc' on 1/2, 6/7, 24/25 and 26/27, 'ray bundles' on 29/30 and 'active aurora' on 1/2 and 13/14, from observers in Fair Isle and parts of Scotland. In Reykjavik, **Terry Ashton** saw auroral displays on December 4/5, 5/6, 9/10, 10/11, 11/12, 14/15 and 17/18.

Hopwood (Upton on Severn), **Karl Lewis** (Saltash), **Ron Livesey**, **David Pettitt** (Carlisle), **Tom Rackham** (Goostrey) and **Tony Rickwood** (Gillingham) recorded between them relatively low-order disturbances to the Earth's magnetic field on December 1, 4-6, 9, 10, 13-15, 18, 19, 20, 23 & 26-28.

SSTV

"It is worth a tune about after the day's activity," wrote **John Scott** in his slow-scan television report for December. At 1750 on the 30th, after most of the activity had passed, John tuned around 14.230MHz and copied pictures from the Canary Island. Some of the captions that he logged during the month came from Germany, Hungary, Spain, **Fig. 6**, Scotland, Ukraine, **Fig. 7** and the USA. John found that when the bands are busy, he required a secondary system, so, he blew the dust off his Realistic DX-160 receiver and Spectrum computer, loaded the G1FTU software and put it back into action alongside his PC set-up. He reminds us that, "the Spectrum and the G1FTU program gives good results without forking out money on a PC to start with."

Fig. 6.

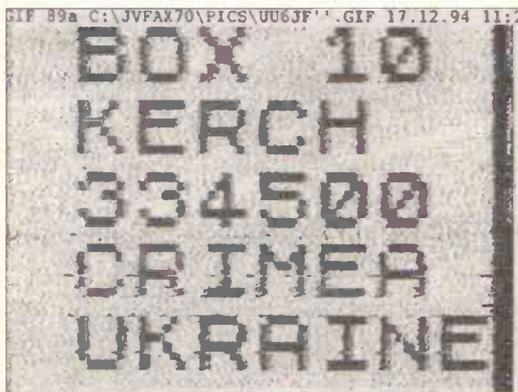
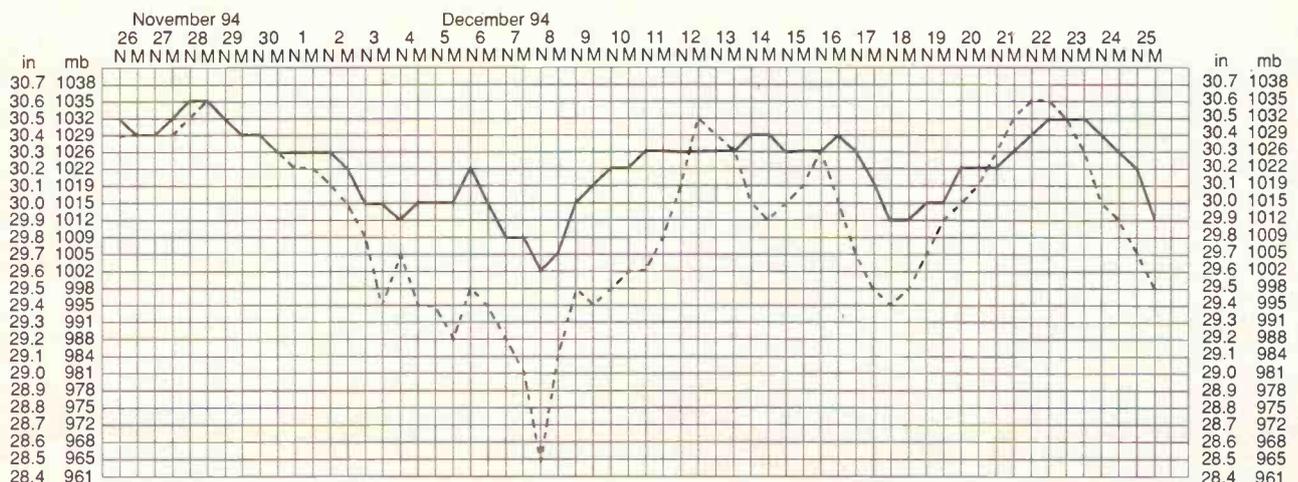


Fig. 7.



Fig. 4.



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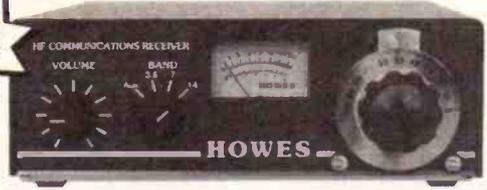
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AS REVIEWED in SWM!



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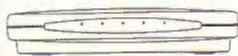
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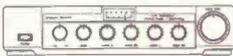
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SSB Utility Listening

HF Sideband

Last month I mentioned the prospect of some frequency changes by the US forces. Little did I know that two days after posting my column off to the Editorial Offices, the 'proposed' changes came into force! The change to 3kHz spacing was agreed upon by ITU member nations at the WARC-92 conference; obviously the changes have taken a while to filter through the system! The changes involve all aeronautical mobile services between 3MHz and 18MHz (actually 3.025 and 18.030MHz). The changes became effective to US military systems on 22 December 1994. I don't know if the change will eventually affect the 'civilian' h.f. networks, only time will tell!

One of the first indications that things had changed occurred early on the 22nd when a USSTRATCOM station (callsign 'Tinhorn') called Thule (Greenland) on 6.738MHz. The Thule operator made Tinhorn move to 6.739MHz, where they made a phone-patch. After the call had completed, the Thule operator explained that the frequency changes had taken place, and passed-on most of the new GHFS frequencies:

4.724, 6.739, 8.968, 13.200, 17.976, 11.175. (all in MHz u.s.b.)

These, in fact, were just the new frequencies as used by Thule, so the operator then gave a run-down of several other GHFS stations, and their new frequencies:

Lajes: 6.712, 15.016, 8.968
 Croughton: 4.724, 6.712, 8.968, 11.175, 15.016, 17.976 & 13.200
 Offutt: 6.739 (2300-0800Z), 17.976 (0800-2300Z), 8.968 & 11.175 (24hrs)(all in MHz u.s.b.)

It would seem that the GHFS operators are carefully monitoring

both the old and new frequencies, and when a station calls on the old frequency, they are being told to QSY to the new frequencies. Last month I mentioned briefly the USAF *Flight Information Handbook* ('FLIP'); a few hours before the change-over to the new frequencies, Thule GHFS was working an aircraft on 4.724MHz and commented "...due to a current 'short circuit', they didn't get it in the FLIP. Turn to page B32 and mark it...."! The next edition of the FLIP is not expected until May 1995.

On this page is a listing of the new USAF GHFS frequencies listed by location. This listing takes the place of Traffic Log this month.

The US Navy have also changed their frequencies; one of their new frequencies is 8.971MHz (Safety of Flight, was 8.972MHz).

Likewise, the US Coast Guard have changed also. Last month I mentioned that there had been some traffic on 5.695MHz, 1kHz down from one of their primary frequencies. This now appears to have been purely temporary, as they were back on 5.696MHz by late December, but all their other published frequencies had changed; they now use 5.696, 8.983 (was 8.984) and 11.202 (was 11.201).

The Canadian Forces have also changed their frequencies to conform to the bandplan. During early December, Canforce 1 was working Trenton Military, and were passed the following list of frequencies:

4.703, 6.706, 6.754 (weather), 9.007, 11.232, 13.257, 15.031, 17.994. (all in MHz u.s.b.)

My comment last month about the VOLMET broadcasts using new frequencies was a bit wide of the mark; it seems that they must have been testing their new frequencies, and at some point changed completely to the new set. A couple

of other Canadian frequencies worth mentioning are 6.683 and 5.717MHz. The former is one of the Canadian MACS frequencies (similar to USAF GHFS), and the latter is their primary SAR frequency.

As a service to readers of this column, I am able to offer a listing of all the new frequencies, which is annotated with the frequency users identified so far. So what do I want for a copy of this listing? Simple, a large (A5 minimum) stamped s.a.e. to the address at the head of the column. Remember, no **stamped** s.a.e., no list - no exceptions! The listing is not available from the Editorial Office, only the above address. You could always use this opportunity to send me copy of your own loggings.

Aufwiedersehen Pet!

By the time that you read these words, the Lufthansa Frankfurt LDOC station will be no more! It was closed as a cost-cutting exercise; its final contact was on 31 December 1994. For many years, Lufthansa aircraft flying around the globe have contacted their base on h.f. using the following frequencies:

3.010, 4.687, 6.637, 8.921, 10.078, 13.327, 17.931, 21.979 (all in MHz u.s.b.)

From 1 January 1995, Lufthansa h.f. traffic will be handled by Stockholm Radio (Sweden) and Berne Radio (Switzerland) on the following frequencies:

Berne: 4.654, 6.643, 8.936, 10.069, 13.205, 15.046, 18.023, 21.988 (all 24hrs), 23.285 (daytime only)
 Stockholm: 3.494 (2200-0200Z), 5.541, 8.930, 11.345, 13.342, 17.915, 23.210 (0200-2200Z) (all in MHz u.s.b.)

Table 1: US Air Force GHFS frequencies (MHz)

Albrook:	6.739, 8.992 (0001-1200Z), 11.175 (24hr), 15.016 (1200-2400Z).
Andersen:	4.724 (0900-2000Z), 6.739 (0700-2200Z), 8.968 (24hr), 11.175 (24hr), 13.200 (2000-0900Z).
Andrews:	4.724, 6.739, 8.968, 11.175, 15.016, 17.976
Ascension:	6.712, 6.739, 8.992, 11.175, 15.016.
Croughton:	4.724, 6.712 (24hr), 8.968, 11.175 (24hr), 13.200, 15.016, 17.976.
Elmendorf:	6.739 (24hr), 8.968, 11.175 (24hr), 13.200 (2000-0600Z), 15.016, 17.976.
Hickam:	6.739 (0400-1900Z), 8.968, 11.175, 13.200.
Incirlik:	4.724, 6.739 (1500-0700Z), 8.992, 11.175 (24hr), 13.215, 15.016 (0500-2000Z), 17.976.
Lajes:	6.712 (24hr), 8.968 (24hr), 15.016.
MacDill:	6.739, 8.968, 11.175, 15.016.
McClellan:	4.724, 6.739, 8.968, 11.175, 13.200, 15.016, 17.976.
Offutt:	4.724, 6.712, 6.739 (2300-0800Z), 8.968 & 11.175 (24hrs), 13.200, 15.016, 17.976 (0800-2300Z).
Thule:	4.724, 6.739, 8.968, 11.175, 15.016, 17.976.
Yokota:	4.724, 6.739, 8.968, 8.992, 11.175, 13.200, 15.016, 17.976.

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Satellite TV News

The Latest from the Clarke Belt

Three main events have kept sat-zappers active during the past few weeks though such high activity tends to reflect the misfortunes of others. The on-going conflicts in Chechnya with the local forces in and around Grozny during their fight to maintain independence has brought the most graphic pictures showing the full horror of war. The destruction is not unlike Berlin at the end of World War II as street to street, house to house fighting continued in attempts to flush out the few remaining Nazi forces. And as the Presidential Palace crumbles in Grozny the local forces put up an heroic fight with news cameras shooting alongside the freedom fighters, the tragedy of the local population and the dogs eating the dead of the Russian 'invasion' forces. This has all been played out over the satellite news feeds though generally the footage screened across the UK networks is somewhat toned down from the more brutal uncensored news bulletins seen around Europe. There seem to be at least two satellite news gathering units (SNG) operating in/around Grozny, certainly Starbird's UKI-48 and VTM's SNG-2 are active at Chechnya with numerous feeds European bound via Eutelsat II F3 @ 16°E and II F1 13°E. CBS News have been operating in Telecom band on 16°E, 12.537GHz back into the UK for onwards linking over the Atlantic circuits, their operational site is detailed as Vladikaukas. One interesting sighting by **John Locker** (Wirral) during a journalist's report was the actual uplinking equipment, the offset dish was installed 'on it's back' with the LNB + arm assembly in the air. The dish will still work efficiently though offers a very low profile, perhaps wise in a conflict zone since an upright dish offers an attractive target for trigger happy soldiers!

Whilst monitoring the Reuters Eutelsat 13°E transponder lease (12.521GHz) late night on January 16 the on-screen menu indicated an upcoming news insert on the Japanese earthquake. At 2240 locked-off camera shots in an office showed the whole building shaking, furniture falling, etc. - by the next morning the full horror of a major earthquake was known across Kobe, Osaka and Kyoto. Newsreel familiar with that of the Californian quake January 1994 revealed the mass destruction. News out of Japan usually will travel, into and across the States in C Band and continue over the Atlantic in either C or Ku into Europe via Intelsat or PAS-1 Ku @ 45°W. The more direct route is via an Indian Ocean region (IOR) such as an Intelsat carrier that should access into

the BTI Teleport London or Goonhilly.

More home grown action - and near to yours truly - was the escape and subsequent recapture of the Parkhurst 3, though the ramifications of this event continue to toll through Westminster, the Home Office and the Prison Service. Public attention was drawn to the prisoners that had backgrounds of violence and seemingly had easily escaped captivity to roam the Isle of Wight for 5 days until capture night of January 8. The media seeking relief perhaps from Chechnya flung full effort into coverage, at least 1 SNG unit was resident on the Island for some days, Sky News being prominent with coverage weekend of the 7/8, offering links into Isleworth via both 16°E (II F3) and 25°E (I F4).

Both **Andrew Sykes** (Kings Lynn) and **John Locker** report activity from Orion 1 at 37°W - on test - with carriers and no pictures. I checked out this bird over the Christmas break and found strong carriers into the 50dBW levels so stand by for another hot spot.

Whilst in the corporate theme, **Donald Lynn** (Melton Mowbray) has logged the Microsoft computer company with software demonstrations, news updates etc on the 1st and 3rd Tuesday of each month on either transponder 18 or 21 of sat K @ 21°W at 1430UTC for about an hour or so. Donald himself a computer enthusiast operates in both C and Ku satellite bands with a 1.8m Hirschmann dish and Chaparral 500FD receiver, his other interests are Teutonic and Slavonic groups of languages and monitors the Russian Octahkno NTA channel via Gorizont @ 14°W - 3.675GHz.

SWM reader Fred Hartley (Hayes) reminds us that Ku band transmissions can be seen from Intelsat 506, 50°W at 11.635GHz vertical (audio 6.6MHz) from CNBC with material for the Super Channel service, best time for viewing this inclined orbit craft is midday onwards. Along the Clarke Belt to 53°W is Intelsat 513 that is generally quiet though from time to time - particularly at exhibition times - the 12.570GHz transponder springs to life, with the UK Cable and Satellite Show early April this may again come to life though if digital transmissions are carried only a noise effect will be seen.

Julian Redwood (Christchurch) spends much time with the specialist 4GHz C Band - often regarded as a DXing satellite band! The TDRS 41°W satellite continues to throw up exciting catches such as the Denver Teleport 4.078GHz but soon after this sighting an inadvertent 12V short circuit into his receiver's MAC input has blown said

unit up and all videob and u.h.f. modulation have ceased - Julian is currently off the air!!

Heavenly News

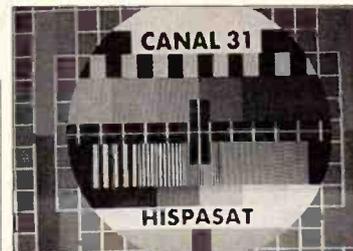
Over the closing days of 1994 the publicity department of satellite owner Intelsat has been busy. They advise that the pan-Arabic Orbiz International broadcaster now downlinking over 20 TV channels in digital compression (and numerous radio programmes) are to establish their total output on four 112MHz transponders on Intelsat 704 @ 66°E, using a west spot beam capable of illuminating the UK and central Europe at 50dBW despite the low elevation from the target areas. A 2nd 50dBW spot will centre on the Red Sea covering the central, Middle Eastern region. The Intelsat output is in addition to the main Middle East coverage beam from Arabsat in C Band. Intelsat are to lease 11 C Band 36MHz transponder on the Indian INSAT-2E for 10 years once launched in early 1998. And the new POR (Pacific Ocean Region) satellite Intelsat 703 will now offer expanded services across the region from its 177 East parking slot, the former incumbent Intelsat 511 has been moved to 180°E.

The media press confirms that the Iranian Parliament has now banned the sale, use and ownership of satellite dishes in the country. Following ratification of the new bill, all dishes and related equipment must be dismantled within 28 days, failure to adhere to this law will render sinners to fines up to £1000 and confiscation of equipment. There is an active black market for small dishes in the country, dish sales in Tehran alone are thought to be 250 000 dish installation! Meanwhile the Syrian authorities in Damascus are to ban unlicensed satellite installations to protect viewers from the worst excesses of the Western programmes.

Full marks to any reader that can pronounce the name of a recently launched TV satellite. 'Dongfanghong 3' carries 24 C Band transponders and will be used in the telecoms and broadcast relay market. Better news for the pan-European Lyons based 'Euronews' service, the Swiss government have granted 1 million Swiss Francs (around £0.5million UK) to help maintain the multi-lingual service which in recent times has suffered a lack of funding. From early March, Euronews will carry a multi-lingual Teletext service as an additional service on the Eutelsat II F1 13°E downlink.



RTL like the French networks are now opting for NICAM stereo.



An excellent shot of the 30°W Hispasat Canal 31 test card

(Andrew Sykes)



Caption preceding a car rally sports news feed via Eutelsat 13°E.



A Eutelsat II F3 16°E news feed early in the Russian/Chechnya conflict uplinking 525-line NTSC into the UK for onwards feeding via the North Atlantic circuit.



Prisoners on the run and Sky News visits the Isle of Wight.



Another Andrew Sykes sighting on 16°E preceding a very boring meeting!

Airband

I don't have an information sheet on my Museum but, for the benefit of readers who'd like to know (such as **John Haswell** of Sundridge), I can tell you about it now. The collection is small, mainly in one room, with bits of airframe in the garden. The objective is to demonstrate the principles by which aircraft are flown and navigated, an example of each main instrument of flight being on display. Much of the equipment works in the sense that it can be demonstrated. Admission is free, by prior appointment (telephone number at the end of this article), but no more than four visitors will fit in the premises at a time.

Memorabilia

If you want a special gift, Picture Account run by Peter Mugridge (74 Miles Road, Epsom, Surrey KT19 9AD) might be able to help. Peter specialises in transferring photos to such items as plates, fridge magnets, key fobs and many more. Peter goes round photographing aircraft for his portfolio and so I'm sure can come up with something to interest the aviation enthusiast when choosing a present.

Thanks **R.A. Blackman** (17 Lime Tree Way, Formby, Liverpool L37 2LT) for the wartime flight safety publications. He also has two aircraft cameras (one is stores ref. 14A/1388 and the other is a Verifying Camera Type 2) as well as a compass (ref. 6A/0745) for sale - one at least, and presumably all, being of wartime vintage and historical value. Offers direct to the vendor please.

Hardware

What sort of h.f. transceivers do aircraft carry these days? **Maxwell Mak** (Lancaster) wants to know. Current equipment, being synthesised, should be able to tune any of the aeronautical allocations. Early sets were more restricted, for example the ex-VC-10 Collins 618S in my Museum only manages 114 channels between 2.182 and 17.965MHz. There's usually an antenna with automatic a.t.u. close by. Older aircraft have a wire sloping upwards from on top of the cockpit to the top of the leading edge of the fin. The classic B.747 has a noticeable 'jousting lance' antenna protruding back from a wing-tip and more recent aircraft have the antenna built in to the fin as a panel. Don't forget it's all upper sideband

on h.f. these days and controllers contact the aircraft by Selcall (selective calling).

On the subject of h.f. I am always interested in any news or frequency changes. I'll also answer questions about general procedural matters, of course, since that's the main purpose of this column. Most of the civil traffic is routine, so there isn't often much to say about it. Military news tends to appear in the 'SSB Utility' column. As mentioned last month, *JP Airline Fleets* is a useful but expensive publication; **Geoffrey Powell** (Tamworth) recommends it. For more details, see my review of the Seldec decoder in next month's issue.

Craig Palfreeman (Cleveland) never misses an issue as "...it's the only 'mag' with any real info on airband." Thanks for the compliment! He's been experimenting with the Lowe Airmaster that was reviewed in 'Decode' (January *SWM* page 70). This computer software package and interface is able to take in ACARS messages from a radio receiver and decode their text content. The messages sound like bursts of noise on certain company operations frequencies (mainly 131.725MHz).

What disappoints me is that, having spent the money, the system only does the 'easy' bit: a simple data conversion task of making the transmitted signal come out as raw text. The information is still encoded and no attempt seems to be made to decode it into something meaningful to humans. This results in the operator having to thumb through a reference book to work out what the codes stand for. This is a well-established computer task and I can't see why the system isn't equipped with in-built look-up tables and algorithms in order to accomplish it. Perhaps the next version? I suppose it's better to have raw text than just bursts of noise. Craig has kindly offered to share information about this technique and readers of this column are invited to 'phone him on (01642) 585290.

Your Experiences

Living in Plymouth, **Howard Turner** is close to Roborough Airport. He saw an aircraft land in the middle of the night, outside the Airport's published operational hours. Assuming the runway lights were on and it was therefore safe to do so, there's nothing preventing a private flight from landing. If Air



Varga Kachina.

Christine Mlynek.



Duxford Aviation Society preserve this Herald.

Christine Mlynek.

Traffic is closed then it is correct practice to transmit position reports blind on their frequency. Public transport operations might have a problem as fire cover is not necessarily available when the aerodrome is shut.

Alan Page (Loughborough) got to see the inside of A.330 F-WWUK that is in the livery of Cathay Pacific despite its French test registration. Supporting the UK economy, it's powered by the Rolls-Royce Trent (really an uprated RB-211). With no control yoke, there's lots of room in front of each pilot for a folding meal-tray (Airbus got their priorities right!). This does raise the problem of where to hang your headset, though, but I see from Alan's photo that the direct-vision window handle serves this purpose. There is manual control in the form of a joystick (side-stick) and rudder pedals. The whole appearance in the cockpit is devoid of clutter.

Sadly, two crew and three others died on board Algerian B.737-2D6C 7T-VEE (constructor's number 20758) when it crashed on final approach to Coventry runway 23 on 21 December 1994. AAIB *Bulletin* S 1/95 is effectively a press release about the occurrence. There was an important aeronautical radio aspect. There's i.l.s. on 23 but on a frequency that can only be received by a radio equipped for 50kHz channel separation (109.75MHz) rather than the dder 100kHz spacing. Finding the runway was

therefore done by radar guidance (Surveillance Radar Approach) followed by visual sighting. Earlier, the same crew had accomplished this procedure at East Midlands. At the time of the accident, the crew had been on duty for over nine hours and were on their fifth approach of the duty period.

I conjecture that the lack of glideslope guidance would add to the workload of an already tired crew. They were setting up a descent by reference to the altimeter. At certain distances from the runway, as seen on radar, they were told their expected altitude by the controller. All was well at first, but the aircraft descended below a safe height in the final stage of its approach at a time when the runway would just be becoming visible. To compound the situation, the controller lost contact for about 10 seconds due to a power failure on the ground and it was probably at this moment that the crash occurred. The interruption was not the cause, the incorrect descent was to blame; but it couldn't have happened at a worse time.

This is an ironic end to the live-animal-export-flights that have recently been in the news (no animals were killed). It also raises questions about 'flagging out'; why choose an aircraft flying under the Algerian flag when British airlines are desperate for work? The 50kHz i.l.s. channels were implemented before 1991 according to the relevant AIC.

Follow-Ups

In January I reported that **David Craig** (Lightwater) had seen a demonstration of world-wide aircraft position reporting on a computer position connected to the SITA network. **Graham Tanner** (Harlington) would like one of these but can't afford the £15 000 asking price!

Frequency and Operational News

GASIL 12/94 from the CAA says that Perth Approach 122.3 is not available, so try 119.8MHz. This might only be temporary. Also from the CAA, AIC 128/1994 adds new d.m.e.s to the i.l.s. at Aberdeen (I-AX, 109.9MHz, runway 17); East Midlands (I-EMW, 109.9MHz, runway 09; I-EME, 109.9MHz, runway 27); and Norwich (I-NH, 110.9MHz, runway 27). Woodford loses its markers on runway 25. Fowlmere no longer has runway 17/35.

Between April and October this year, European flight plan processing and flow management (departure flow regulation) responsibilities will transfer to two parallel centres on the continent. AIC 131/1994 updates the progress of this move. There are no implications for frequency changes but, when waiting for a slot, you now

know who to blame.

Some frequencies are requested by **Robin Kemp** (Enfield). Please note, Robin, that all replies appear in the column so that everybody can share the information. Helicopters in the London and London (City) zones tend to work Special VFR 119.9 or Thames Radar 132.7MHz. Helicopter Route H9 crosses both Northolt and Heathrow where there will be brief handovers to Aerodrome Control (Tower) for this purpose. This is clearly seen on the chart Helicopter Routes in the London Control Zone which is sold by the CAA.

Why not get my *Airband Factsheet*? This tells you the addresses from which charts, etc., can be bought by mail order. Just send a stamped, self-addressed reply envelope to the Editorial Offices in Broadstone; it only needs to hold a single A4 sheet.

Outside the zone, helicopters talk to any aerodrome that they might be near. There's also DEPCOM 122.95MHz for alerting other helicopters that a flight is about to depart from a place where there's no ground radio, and the HEMS emergency medical service uses this extensively. The Metropolitan Police have helicopters operating out of Lippitts Hill with the callsign 'Special'.

Balloons and hang gliders were

Abbreviations

A.	Airbus
AAIB	Air Accidents Investigation Branch
ACARS	Aircraft Communications Addressing and Reporting System
AIC	Aeronautical Information Circular
a.t.u.	antenna tuning unit
B.	Boeing
CAA	Civil Aviation Authority
d.m.e.	distance measuring equipment
f.m.	frequency modulation
GASIL	General Aviation Safety Information Leaflet
h.f.	high frequency
i.l.s.	Instrument landing system
kHz	kilohertz
MHz	megahertz
s.s.b.	single sideband
VFR	Visual Flight Rules

on 129.9 but have moved to 122.475 in the UK, 122.25MHz in Europe. Capital Radio's Flying Eye G-FLII is currently a Baron based at Elstree and works the same frequencies as the helicopters. Studio link is 446.3 and 455.075MHz f.m.

Further afield, Concorde works the same frequencies as all other oceanic and British Airways traffic, although it has its own fixed routes. British Airways operations include 131.55, 131.775, 131.8, 131.85 and 131.9MHz. On h.f. British Airways are on 3.497, 5.535, 8.921, 10.072, 11.333, 13.330, 13.333, 17.922 and 21.946MHz. Air France have 6.526,

6.624, 6.637, 6.712, 8.972, 10.093, 11.351, 13.351, 11.7916 and 21.940MHz. At this stage of the sunspot cycle, the higher frequencies (above about 9.000MHz) aren't much use.

The next three deadlines (for topical information) are March 16, April 13 and May 12. Replies always appear in this column and it is regretted that no direct correspondence is possible. Genuinely urgent information/enquiries: 0181-958 5113 (before 2130 local please).

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Amateur Bands Round-up

Listening to the Amateurs

This the first column to be written in 1995 comes after a somewhat traumatic month on the air. First, a December gale took away the halyard for the long-wire; then the two-metre multi-mode quit in the middle of a slow Morse transmission, and the other two-metre rig then made what sounded like an expensive noise and expired! As a little sideline the ancient TS-520 requires a simple repair - thirty seconds to do the job, but who knows how long to remove and refit the front panel.

Lessons: the halyard had chafed on a concrete patch. The multi-mode gave up simply because in the build, some twenty years ago, a short piece of screened wire had been laid awkwardly at one end - the inner looking one way and the braid exactly the opposite. Twenty years of sitting in that awkward manner, and the pvc had 'cold flowed' away from the pressure point resulting in a short-circuit. As for the other one, an unsatisfactory end; once I had it all apart on the bench and then powered it up the fault had gone away. One can only assume a lead inside the rig had been trapped under pressure. For the '520, just take a bit more care in carrying it next time! The mental effort involved at least relieved me of any need to watch Christmas TV!

Antennas

Often in your letters I hear of your difficulties with antennas. Most people who have seen my end-fed are somewhat surprised that it hears or works anything; and yet on 3.5/7MHz late night listening has yielded all continents on each band, and at workable strength. For Top Band, it isn't a wonder-worker by any means, but it isn't bad. As an alternative, I can strap the feeders of my tri-band beam together, and feed against earth. The secrets are three: first, an antenna tuner that can cope with your particular antenna; second, the ability to detect when the tuner is in fact 'on the nose' and third, as much attention as possible to whatever serves you as an earth. Except in very rare cases, above-ground radials serve better than buried ones.

Letters

First, thanks to everyone who sent greetings or cards.

Gordon Robertson is BRS95210 and lives in Bodmin in Cornwall. As he is now 52 (lucky youngster by my lights!) he obviously took up the hobby later in life than most of us. However, at the time of his letter Gordon was gently chuckling to himself over his nice new Kenwood R-5000 - and who can blame him?

A Catch

Geoff Crowley spends half his life in Aberdeen and the other part in the North Sea; at the time he wrote, things were fairly normal - 75-knot winds and 11-metre waves! Back in Aberdeen, Geoff has been exercising his half-sized G5RV on 1.8 and 3.5MHz with success. On Top Band Geoff copied ZL2JR's sideband, working Gs, on 1.843MHz, at 0745 on December 7. That is most definitely a catch! Anyone who has a grey line propagation program on the computer will realise just how brief the opening is likely to be. For the rest Top Band gave some eighteen or so Gs, GWOLBI's low-power signals, CT1AOZ, DLs, EU, EW, F6, a brace of Italians, plus various CIS stations in Europe and Asia. As for 3.5MHz there was a 'thing' calling itself 7NU, plus 9M8DB, JA7N, K1JJ, KB1MN, KC9H in Wisconsin, KD4LHA, KK5BW, KN5S, N6SW (logged as being in Texas), N8AJX noted as being in Michigan on December 10 and Miami on 13th, VE1HK, VE1YP, W0JM, W3GH, W4QCU, W6ECP, W8KLI, WD1Q for New Mexico, WP4U and YV5FJU. Finally just one on 14MHz by way of BV4AS. For something different Geoff has had the odd two-metre contact using his G5RV!

Now we turn to Earl Shilton where **Dennis Sheppard** lives. Dennis had noted something of the disgraceful behaviour and operating habits of some of the DLs at the top end of the 3.5MHz band; but when he recently had a German guest who translated the words to him fluently, he was appalled. This is not a new phenomenon by any means, and it is about time the German licensing authorities stepped in. Outside of this, Dennis noted sideband signals from such as AP2ARS, C6AFV, EP9CU, FG5FK, FK8CP, FM5DN, HH2MC, HH7PV, HK4DHR, HV4NAC, JA4DND, JT1BR, J8/F6AOI, J37HW, J87FT, JW5NM, JW0C, K6UA, KL7KJ, LU1FA, PZ1EL, RV9CHB, TG9GI, TI2CF, U4MIR (in Moscow, not space!), UA0KM/M, V21BF, V47F,

VE8HL, WA0GFS, YB3OSE, YK1AO, YV5ABH, ZP5GCV, 5N0GC, 5T5BN, 5U7YY, 8P9CU, 8R1AK, 9M8DB, plus a crop of VKs, ZLs and Ws. As for 28MHz the score here included EL2PP, ZS94F, ZS6BRH, 9J2FR, RA4CY and ZB4ESB.

Chess on Air

John Collins from Birmingham notes that Russian stations say Box 88 is no longer safe, owing to the level of theft, so it is preferable to send your report direct. On a different tack, John says he has heard that during the Cold War period, Russian and American stations played chess by radio; he asks if this is a fable. There was a period, back in the Stalin era, when USSR stations weren't supposed to work other countries. Outside of this period, chess enthusiasts have been known to play games over the air, and since the USSR countries are so chess-minded, one would think they would almost certainly have joined in. The routine, as I recall it from years ago was that you had a sked at the same time and frequency each day; each had a board, and passed one move a day, so each side got a day to think of his reply. Using the chess notation a move could be passed in a second or so, even on c.w. - and this as I recall was before the widespread adoption of sideband.

Turning to the log, John spotted Slim in Gaza, sporting 'ZC6B', which most certainly isn't legitimate - in fact it falls into an ITU block allocated to UK. We might perhaps envisage a new Palestine, but if so, it wouldn't have such a prefix anyway. On 7MHz John picked up C31SG, VP2EY, LU2DX, J37XC, XQ8ABF, JF8UWT (a YL operator), 8V1AK, a BJ signal that John couldn't copy completely, PA/DL9OBQ on IOTA EU 38 with nine elements of four-band beam and a TS-940S, EA6/G4SSN, V44KAO calling CQ, ZA1AJ around 0500, YB6INU at 0100 and TI2IDX at around 0200.

Maximum Usable Frequency

Arising from my recent bit in this magazine on propagation, **Frank Lennon** in Hyde, Cheshire, wonders whether there is any difference in propagation as between, say the southerly and the further northern parts of UK. Very definitely there is a difference. For a

starter, maximum usable frequencies are in general lower as you approach the poles (for example the GB2RS script for January 8 predicted m.u.f.s of 21MHz in the south and 18MHz up north). The human factor also comes into this. If for example, the people in the south are all commenting that 'the band is going out' the stations elsewhere hear this, assume it means all the UK, and stop listening. Depending on the band this may work for or against one.

Zones

Now to Frank's second question: what are all these CQ and ITU Zones? Let's start with the CQ Zones first. These were invented many years ago by *CQ Magazine* for an award known as 'Worked All Zones' or WAZ. There are forty zones to cover the whole world; for example, UK is in Zone 14. Some were easy, some less so, some damnably difficult! Many an operator has his 100 countries confirmed and DXCC certificate upon the wall long before he completes on WAZ. For years the hardest were Zone 19 (a sparsely-populated part of UAO) and Zone 23 (a similar part of UAO plus part of China); I think they are still tough, and Zone 31 isn't a pushover either!

WAZ is, I reckon, the toughest award available. Turning to ITU Zones, they are a much more recent idea thought up by the International Telecommunications Union, the world-wide regulatory body; there around ninety of these, some of which are landless lumps of ocean. There used to be an award for working so many ITU zones, but I'm not in fact sure whether it still exists.

Frank's log includes Top Band from the former Yugoslavia, and on 3.5MHz GB2SM, east coast Ws, V2RL (Antigua/Barbuda) and WB5JHK in Arkansas. 14MHz yielded PT3BZ, OD5WS, YV4BLR, 5N8NDP, AP2JZB, WP2ANC (St Croix), A71AK, 8R1WD, UN0PYL (Uzbekistan), VKs, ZLs, VK9NS (Norfolk Is), 9J2BF, BV4AS, W6s, W0s, AL7EL and on each band of course the smaller fry.

That's it for another time; send your letters to me at Box 4, Newtown, Powys SY16 1ZZ, to reach me by the beginning of the month. Apart from your lists, don't forget your questions, and comments grave or comic - they make your conductor's life richer!

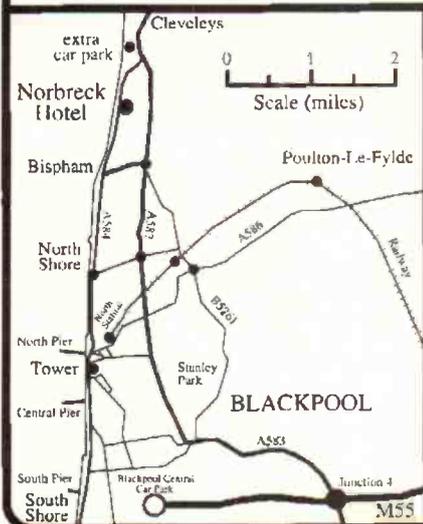
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Scanning

Please note the change of address at the head of the column - any mail sent to the old address will still reach me, so don't worry! Apart from that there is very little mail to go on this month so I'm going to get into what's available and then shift into some frequencies which you may, or may not, find interesting.

Graham Rankin Snr of Bromborough, on the Wirral, poses what could be an interesting question that requires an equally interesting answer! It concerns ownership of sets, and follows reports published in *Monitoring Times*, which is of US origin, but freely available over here. The article states that the owner of a Yupiteru 7100 was fined the staggering sum of \$10 000 simply for having the set! This is very likely due to the set's ability to receive the mobile 'phone nets - a practice outlawed in the US and quite obviously enforced, too! It does back up some of the previous reports I've highlighted regarding the severity of the law where 'eavesdropping AKA bugging' is suspected. Also, that something I heard quite a while ago from a serving police officer - that carrying a scanner could be tantamount to being equipped to commit a crime - could possibly be brought in to support any law as and when required.

However, the real question Graham asks is that the above publication also outlined the case of a New Jersey resident stopped by police and breathalysed, the result being positive. At the hearing at a court, the case was dropped on the grounds that the arresting officer had had his radio turned off - and there were also doubts raised by the prosecution as to whether other officers in the vicinity also had their sets turned off. Case dismissed! Does this mean, Graham asks, that radio sets will affect the readings of a breathalyser? It's a bit like the banning of radio receivers aboard aircraft, where proof exists as to interference caused to navigation equipment. Isn't it?

He also goes on to say that he is concerned that perhaps this situation is the same in the UK and that certain radio receivers - and their almost minimal levels of external interference - could affect the results of the testing officers equipment - subsequently begging the question has it ever happened in the UK? In the UK it is not the first test that is counted but the second, made on a more sophisticated machine and at the police station. Graham has

written to a leading UK newspaper - but has heard nothing on the issue. Do any of the readers know anything about this? Are there any police officers or radio buffs who could enlighten him - and, I'm sure, many of you too - on the issue?

It brings to mind the CB 'scam' of many years ago - on the illegal 27MHz a.m. band - and mobile amplifiers - 'burners' - throwing out anything up to 100W. Apparently, if you drove to a petrol station and, after filling up the car with a tankful of petrol, you keyed the mic which then zeroed the meter! You pushed another £1 of petrol in to make time at the pump look good! The practise was stopped when it was exposed by a daily newspaper and the petrol companies got wise to it!

N.R. Simpson of Darlington wrote in with some very interesting news on railway scanning within the USA. It is quite open, and Neil tells me he even had a wave or two from passing engine drivers whilst listening to their 'roadchannel'! Frequencies, for those intending to

160.500TX	160.500RX	Road and dispatcher.
160.680TX	160.680RX	Yard.
160.530TX	160.770RX	Road and dispatcher.
160.520TX	161.160RX	Ch.1 dispatcher.
161.400TX	161.400RX	Ch.2 road and yard.

These are just a few of the many Neil sent in. My thanks to him for his time.

visit the USA this year, are as follows:

For those not familiar with US railroad titles: The dispatcher co-ordinates all mainline movements, while the yard frequencies are given over to a yardmaster - responsible for marshalling in and out-going trains. It provides a link between train crew and the yard staff. Surprisingly the guide used by Neil lists BR radio links at 204.850MHz thru 206.300MHz and also 196.850 thru 198.300MHz (50kHz spacings). Further information can be had by

Radio Communications Monitoring Association, PO Box 4563, Anaheim, CA 92803, USA.

or
Kalmbach Publishing Co., 21027 Crossroads Circle, PO Box 1612, Waukesha, WI 53187, USA.

You should ask for the following from Kalmbach:
The Train Watcher's Guide to North American Railroads
American Shortline Railway Guide.
Trains
Compendium of American Railroad Radio Frequencies



Ken Lidgett's station set-up - isn't this comprehensive?

writing to:

It may be of interest to amateurs going 'Stateside this year - and taking 2m TXs with them - that the US has a 'railfan' club going! You could try 146.490 and 146.565 which are Primary and secondary channel respectively.

While on the subject of books, a flyer from Interproducts of Perth gives me details of books of interest to scanner owners, apart from their excellent *UK Scanning Directory*. These books are *Scanner Busters* and *Eavesdropping on The British Military*. Both are A5 format. I am intrigued by the latter as it promises the most comprehensive frequency lists for i.f./m.f./h.f./v.h.f./u.h.f. - I have yet to see one so if Interproducts

1500, Bearcat 200XLT and a Sony 2010. He uses an Icom Discone and two long wires plus a.t.u.s. Ken lives in a good location - 10 minutes drive from the USA and 10 minutes from Niagra Falls. Also, he is located on The Welland Canal, serving both Lake Erie and Lake Ontario and so cops a lot of marine traffic from shipping using the canal and the lakes. I suspect that service traffic from tugs, Canadian and US Coastguard and possibly military traffic - air and sea - is also available. This would be, it seems, an ideal QTHR from which to work from so I'm a bit jealous stuck as I am here at college this term and not really happy with what I hear 'inland'!

Canada features quite highly in my post bag and it's good for me to know the column is read overseas. I have yet to hear from anyone in the USA, Australia and New Zealand and, surprisingly, Europe! Ken fills me in on his equipment, QTHR and areas of interest - if you live in somewhere exotic then why not drop me a line, with a photograph, so that you can be featured here. It will serve two purposes: to show off what you've got and to let me know how much 'DX' I am working!

Marine news now and thanks to Neil Simpson again for these allocations:

457.525 / 457.550 / 457.575 / 467.550 / 467.575 - P&O Dover and Calais.

457.550 / 467.525 / 467.550 / 467.575 - Sally Line Ramsgate, Ostend and Dunkirk.

457.525 / 457.550 - Sealink Fishguard and Rosslare.

These are the u.h.f. on-board hand-helds and are in regular use.

Sea Lynx 1 at Fishguard is using Marine v.h.f. Channel 10. Sea Lynx 2 at Holyhead, however, is using v.h.f. Channel 9 - also used by Point Lynas Pilots and by the Pilot Control Station at Liverpool. There has been little confusion, so far as I know, although I do wonder who has priority over who!

Now, frequencies. I'm taking these from the lists produced - amongst others - by **Tim Anderson** - whose listings I find excellent and very well produced. Tim collates lists himself so if you are in the market for them, why not contact him? This month I'm going to

fancy sending on a review copy I'll certainly put it through the mill for them!

HELP! Chris Smith wrote me about mods for a scanner - which has gone astray between my home address and the Editorial Offices. If you are out there, Chris, can you send in a new copy to the Editorial Offices as there is a backlog of people wishing to modify their sets from your drawing! These things happen and I apologise to all concerned. Chris' mods were highlighted in the December column concerned with the HP-200E. I could blame the GPO I suppose....

I sometimes get mail from Canada and in particular from **Ken Lidgett** of St. Catherine's in Ontario. This month I'm including a photograph of his set up - which, as you can see, has some pretty good kit in. He uses a JRC NRD-535D, Icom R-71A, Icom 7000, Infotech 600 and monitor, Two Realistic PRO-2005s an AOR AR-

start with samplers from the lower end of the v.h.f. spectrum and ask you to monitor and report back in. If it proves successful, we may get on to the next 'bit', and so on. However! I must add that these lists are not complete - so you're not getting a 'full spread'. You'll have to buy from Tim for that! Also, I'd be interested in finding out what goes on, and can be heard, in different locations. That way the 'extra' users can be collated and logged. This is interactive - and you can help so, if you do log anything, please share!

That's just a sample of what's on v.h.f. Low band - and there is plenty more available - depending on conditions and so forth. Scanners are often thought of as being more or less 'local' - that is, you can hear up to about the distance within the line of sight principle but this isn't always strictly true.

If I go up to Holyhead Mountain when I'm in the area and it is a good clear night then I can pick up Irish stations, some out of the North Wales coastline and down Cardigan Bay - even Jersey Radio, Channel Islands

Marine Control, has been logged - but the signal was fluttery and conditions exceptional! The basic guide is to check the barometer if you have one - thinking about it, if you haven't, then why not get one - and the higher the barometric pressure the more chance of hearing 'DX' signals. Other factors are, of course, needed - like good antenna, height and so on but location plays an equally vital part. On the coast, and at height, I can cover a good area in barometric 'highs' but even up there, with low pressure in, I'm back to square one!

The condition is known as propagation lift and is very technical but, in its most simple terms, works along the lines of 'high good', 'low poor'. I did ask, in December's column, whether other readers had experience during propo lift - and this was asked specifically after reports were heard over RAF 'Follow Me' frequencies from places like Sicily from within the UK - but so far I've drawn a blank. Surely someone has heard something?

Also, it brings to mind the meaning of the word 'scanning' - again, seen as being a v.h.f./u.h.f. issue. My personal opinion is that it isn't. I do a lot of h.f. listening with a Sony PRO-80, which is a scanner in that it has the capability to scan channels as I set it to. Some equipment offered to the scanning enthusiast nowadays also has h.f. capability - and, for the

enthusiast who wants to 'go down', the opportunity to hear some fascinating stuff!

Almost finally, based as I am in Oxfordshire, I get the odd chance to drive around the area at the weekend. Drives so far have come across some interesting - but unknown to me - sites. Can anyone help? A variety of antennas at Poundon - and called HMGCC, which I presume is Her Majesty's Government Communications Centre - intrigues me enough to ask if this is what I suspect it is, and that is a GCHQ 'satellite' station? There are long wires, verticals, folded dipoles...and some other types I haven't seen before! Does this station link in with the other just outside Buckingham? Can anyone enlighten me on this score - short of getting themselves done under The Official Secrets Act, of course!

I'm a member of ENIGMA - The European Numbers stations Information Gathering Monitoring Association - and it may be that Poundon could be linked to some of the mysterious numbers that are broadcast over the short waves. I'd be intrigued to hear what you've got to say on the matter anyway!

Finally, the address for Interproducts is:
8 Abbot Street, Perth PH2 0EB.
With that, I'm going to shut it down. Until next month, best regards and good listening!

- 27.045MHz - UK Testing and development frequency.
- 27.995MHz - US Pirate Station.
- 28.650MHz - WA3NAN Relay of NASA Shuttle.
- 29.750MHz - Canadian Fishermen.
- 29.770MHz - Loggers. Washington State.
- 30.700MHz - Oilfield Traffic USA.
- 30.900MHz - Allegheny Port Traffic KGB732 Penn. USA.
- 33.700MHz - New York Fire and Ambulance Department.
- 36.530MHz - US Navy Fireboats San Francisco.
- 38.000MHz - Rascal Comsec UK. (s.s.b.).
- 39.750MHz - Royal Signals Public Display UK.
- 40.080MHz - Sky News Link. UK.
- 47.460MHz - Search and Rescue Idaho USA.
- 47.570MHz - BBC Radio Wales Studio Sound Channel.
- 48.080MHz - BSB Feed? Currently UNID 100%
- 50.110MHz - SSB International Calling.
- 85.712MHz - AA M25 Recovery.

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

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- Autospec - Mks I and II with all known interleaves
- DUP-ARQ Artrac - 125 Baud Simplex ARQ
- Twinplex - 100 Baud F7BC Simplex ARQ
- ASCII - CCITT 5, variable character lengths/parity

- ARQ6-90/98 - 200 Baud Simplex ARQ
- SI-ARQ/ARQ-S - ARQ1000 simplex
- SWED-ARQ/ARQ-SWE - CCIR 518 variant
- ARQ-E/ARQ1000 Duplex
- ARQ-N - ARQ1000 Duplex variant
- ARQ-E3 - CCIR 519 variant
- POL-ARQ - 100 baud Duplex ARQ
- TDM242/ARQ-M2/4-242 CCIR 242 with 1/2/4 channels
- TDM342/ARQ-M2/4 CCIR 342-2 with 1/2/4 channels

- FEC-A - FEC100A/FEC101
- FEC-S - FEC1000 Simplex
- Sports Info. 300 Baud ASCII F7BC
- Hellscreiber - Synch./Asynch.
- Sitor RAW - (Normal Sitor but without synchronisation)
- ARQ6-70
- Baudot F7BBN
- Piccolo Mk6 12 tone/ASCII mode - coming soon!
- GMDSS 100 Baud system - coming soon!

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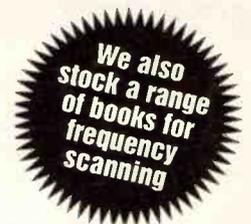
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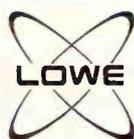
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Info In Orbit

Hearing the first signals from a new satellite is always a fascinating experience. However, there was a twist in the tale of the events of December. While waiting for the launch of NOAA-14 (the new American weather satellite), I continued to monitor electronic mail output from NASA, in the hope of spotting a launch announcement. On December 28 at 1749UTC, I heard an unscheduled transmission of a p.t. (WXSAT telemetry) on 137.50MHz. Unfortunately, the frequencies of the a.p.t. and beacon (136.77MHz) were wrong, the timing was wrong (we were expecting a lunch-time WXSAT), and the channel (video) data was wrong!

WXSATs After Launch

When new WXSATs are launched for operation by America's National Oceanographic and Atmospheric Administration (NOAA), the normal (early orbit) sequence includes a first transmission in the 137MHz band - the beacon on 136.77 or 137.77MHz. During early orbits, sensor channels are prepared for operation. NOAA-14 was scheduled to replace NOAA-13, which failed not long after achieving orbit. NOAA-13 was launched to replace NOAA-9, so a beacon on 137.77MHz, on a north-bound satellite around 1230UTC would be the first signal to identify. I had been monitoring this frequency during the holiday period, waiting for the first signal. So hearing an a.p.t. transmission on 137.50MHz was surprising. After monitoring a few passes, I checked out the current track of NOAA-10, supposedly de-

activated some weeks ago - a perfect match!

While NOAA-10 continued to transmit less-than-perfect infra-red, I received a call from **Dave Cawley** of Timestep Weather Systems, on Saturday December 31 telling me that NOAA-14 had just been launched, and that I could download the first Kepler elements for the WXSAT from his BBS (bulletin board system). At 1252UTC, my scanner picked up the beacon on 137.77MHz. My thanks to Dave for this timely information. Elements for the new satellite were despatched to those on the list, the next day - see Kepler section. More information on NOAA-14 is given in this column.

Current WXSATs (or all was quiet on the eastern front)

If you were monitoring the weakly transmitting METEOR 2-21 in December, you will have seen it approach the morning terminator. It was no surprise to see it de-activated on December 29. What was unusual was the lack of an immediate replacement! For about two weeks, I did not hear any CIS (Russian) WXSAT in operation - a record, as far as I can recall. Around Saturday January 14, METEOR 3-5 began operations during north-bound afternoon (sunlight) passes over Europe, and a good visible-light image was received around 1600UTC.

It seems surprising that no infra-red transmissions have been received from the series three CIS WXSATs for a very long time. They

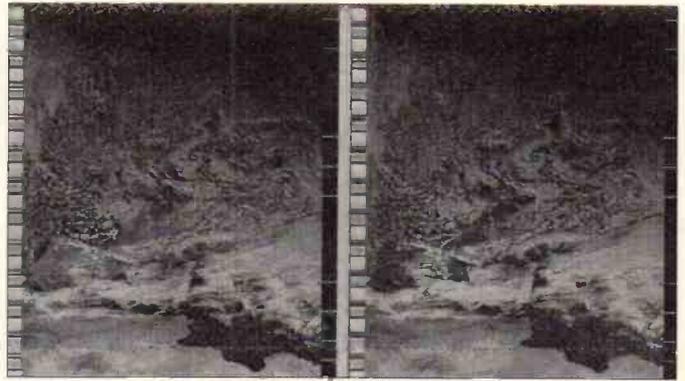


Fig. 1: NOAA-14 early January from me.

were often of good quality, having better resolution than the NOAAs, and had the unusual characteristic of having 'inverted' video, that is, clouds and other cold features were black; warm seas and the hot day-time African desert were light, so the impression was that of an image in reverse. A software facility to reverse the black-and-white scale is very useful.

Monitoring of OKEAN 1-7 (also called OKEAN-4 in some Kepler elements) on 137.40MHz, has been quiet, no passes having been received at my home for some weeks. The picture in **Fig. 3** was received on 5 December and shows 'piano-key' telemetry, followed by an image from the microwave sounder, then one from the on-board, sideways-looking radar system. The area covered runs down to Bulgaria and the edge of the Black Sea.

NOAA-14 and Channel Identification

The latest USA WXSAT, NOAA-J (re-named 14), was launched from Vandenberg on board a re-furbished Atlas 11E ICBM (yes, an inter-continental ballistic missile)! As with others in this series, the orbit is almost circular, averaging 853km, with an orbital inclination of 98.9°.

My first picture from NOAA-14 was recorded overnight during the early hours of January 1. The previous day had seen only beacon telemetry, so I left my recording system in operation, anticipating an a.p.t. transmission. The first image showed channels one and two switched on, (this is normal practice,) so they were blank, night-time passes. Although recorded, being empty they are not shown here. During the day I recorded visible imagery - see **Fig. 1** - an enhanced image. The actual image was very dark due to the low light level of the northern winter - hence enhancement to reveal the details. Careful examination, see later, shows the left channel is number one, and the right channel is two. Spain shows well in channel one, but is considerably fainter in channel two - the result of spectral differences.

Checking out NOAA Side Markings

Look along the sides of any NOAA a.p.t. channel and you can recognise two distinct types of data. One side contains space punctuated by minute markers, the other contains blocks of grey scales. Minute markers consist of four lines, two white and two black, and each should be clearly revealed in a good display - at least on 'zooming' in.

The other side shows grey scale blocks; these are calibration markings. Close examination shows that the pattern of shades repeats every 16 blocks. This means that one a.p.t. 'frame' (as it is called) includes 16 blocks. Each block consists of 8 lines of video data, so a complete frame requires 128 (16 times 8) lines of data. At a data rate of two lines per second, each frame takes 64 seconds. The picture is a continuous one, so the 64 seconds has no other significance, unlike METEOSAT 'frames' which are of fixed duration - four minutes, after which a new picture is transmitted.

Look for two characteristics seen in each sequence of the 16 blocks - the 8-block grey scale, and the 4-block thermal group (in which each block is the same shade). Moving from this group towards the dark end of the grey scale, the next block (after the thermal group) is the patch block (an internal calibration level), followed by the back scan block (an external calibration level). Next comes the channel identification (ID) wedge. Following shades represent Channels 1 through 5 in sequence; the ID wedge can be compared with each in turn, to find the match. Applying this to the NOAA-14 strips, reproduced here - see **Fig. 2** - we see that Channels 1 and 2 were in use from launch.

A detailed description of NOAA telemetry was issued by NOAA as Technical Memorandum NESS 95, back in 1982. Its title is *The Tiros-N/NOAA A-G Satellite Series*.

Letters

New Year brought a large number of letters, pictures and requests in for the column. **J M Henry** of Nottingham told me that he started

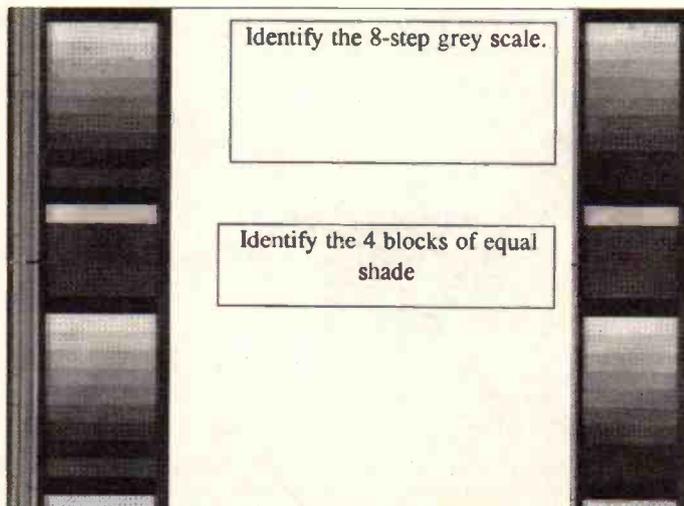


Fig. 2: NOAA-14 calibration blocks.

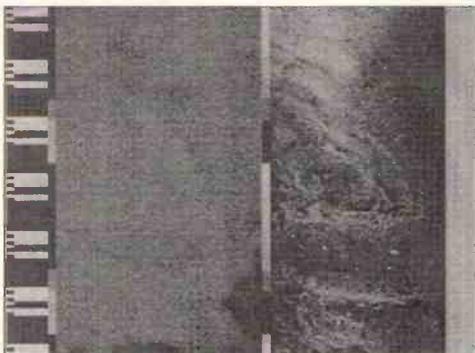


Fig. 3: OKEAN 1-7 on 5 December.



Fig. 4: Shuttle *Discovery* from Intelsat K re-broadcast.

monitoring radio in general, back in 1930, using a crystal set, headphones and a long wire; now he enjoys tracking the WXSATs and wrote to mention that he had picked up NOAA-14.

Sue and John Locker of Newton, Wirral sent in **Fig. 4**, a picture of the *Discovery* Shuttle, a re-broadcast of NASA Select from Intelsat-K. John has been trying to persuade some of the larger communications companies to provide a downlink for NASA Select television. NASA budgets do not include funding for European viewers. It is difficult to view the channel directly from Britain, though there are occasional re-broadcasts, such as that from which John obtained this shuttle picture. It is worth mentioning the regular 'Space Night' programme broadcast by Bayern (B3) transmitting on 11.141GHz (H) from the Astra satellite. Although repetitive, this seems to be the only channel catering for the space enthusiast.

David Noble of Northwich, Cheshire requested details of NOAA signal formats for help with his project to write software for signal decoding. The best way to obtain such detailed information would be from the NOAA Technical Memorandum NESS 95 mentioned above, issued by the National Environmental Service, Department of Commerce in Washington, USA. This booklet, of which I have one copy, gives the entire specification for the signal format. Because of the interest in this subject shown by other readers, I included some details of the NOAA format above, for the benefit of everyone who monitors NOAA pictures and wondered what the side markings signified.

Interference - Pagers or Mains?

It has been some time since anyone has written about severe interference experienced during WXSAT reception, but a letter from **Cedric Roberts** of Halesowen puts this back in the limelight. Cedric retired a few years ago and has been monitoring satellites since the mid-eighties, now using a computer and Dartcom receiving system. I have no information on Dartcom hardware or software because they have not sent any, so I do not know what type of

receiver or software is in use. Since last August, the interference at Cedric's station - has been extremely bad, sometimes obliterating the signal.

Cedric has had the local electricity board visit him, and he tells me that they consider the interference to originate from pagers. It seems that Dartcom view the cause as being electrical (mains) in origin. Cedric has checked each electrical item in his house and all have been ruled out. He also found he could detect the interference some 300m away but could not identify it. The image patterning is quite distinctive, and if line-by-line software synchronisation is not used, the picture loses sync and can break up.

I suffer from this type of interference on my own Dartcom receiver, and when it first started, it was extremely bad. After I contacted Dartcom, one of their staff made some modifications to the i.f. filter circuitry and this reduced the problem considerably. My own suspicion is therefore that of pager interference. On one occasion I saw a similar type of patterning happen when my wife turned on the vacuum cleaner!

If anyone has any contributions, please drop me a line.

Picture Conversion - JPEG

When we receive WXSAT pictures, the raw data files tend to be large. A full METEOR pass may occupy over 2Mb of disk space, yet this can be reduced without data loss. Decoding programs normally have an option to convert selected portions of the pass into one of the recognised picture formats - GIF, PCX, TIFF, BMP, etc. This new file can then be converted into virtually any required format, using any of several programs. These formats normally maintain the integrity of the data - nothing is lost.

A letter from **Martin Ellis** of Plymouth told of his use of the JPEG format. Using a Public Domain program, he has converted his NOAA pictures from PCX format (an option in Timestep's MegaNOAA software), to JPEG format. JPEG is unusual, based on studies of how the eye can be deceived into thinking that all is well with an image. It has the great benefit of requiring far less space than the original image - for instance

a GIF file occupying 60kb may be reduced to a similar JPEG image occupying only 10kb! The price is the loss of true detail. Martin sent me two JPEG WXSAT images that were very good. Perhaps I might include some image processing software as an offer in a future column, for those having any difficulty in obtaining it.

Amiga Predictions Software

A correspondent from Hamilton in Strathclyde (sorry I cannot read the signature), mentions the satellite predictions program written by N Grundy of Bar Farm, 15 Main Road, Drox, Selby, N Yorks YO8 8PA. I mentioned this software some years ago so it's about time it was given another airing.

PC Software

Yes, I admit to having a backlog of software awaiting testing. Experience shows that some Shareware and Public Domain programs are very good, but others can behave erratically. Consequently, before mentioning such software in this column, I test it on several computers - a 386DX, a 486SX and DX, over several days. If it runs happily on all three, I feel safe in giving a brief review in the column and making it generally available. Such was *Birdog*, which ran well on each machine, but two readers had problems with the program, which unfortunately, I am not in a position to test under their individual conditions. During recent weeks I have been running versions of PC-Track and STS-Plus, each of which is fine on perhaps one machine! I hope to make more programs available as soon as circumstances permit.

Future Launches

A month or two back, I mentioned that I am now maintaining an up-to-date listing of scheduled Shuttle launches and other major satellites. NOAA-L is now scheduled for an April launch, within days of the 35th anniversary of the launch of TIROS-1, the first WXSAT. Shuttle STS-67 is scheduled for 2 March, and STS-71 has been postponed until June 8. For

a copy of the listing, please send an s.a.e. and one extra stamp towards the cost of data collection.

Looking further ahead, two additional advanced meteorological satellites have been ordered from Martin Marietta Astro Space of the Martin Marietta Corp., New Jersey. The satellites are to be designated 'N' and 'N-prime', and will be launched after the year 2000. The whole program is a NOAA-funded co-operative effort between NASA and NOAA, Britain, Canada and France. Goddard Space Flight Centre manages the spacecraft from procurement, through launch and initial in-orbit operations, after which spacecraft operations are managed by NOAA.

Future Items

A number of letters have requested more detail on METEOSAT Primary Data equipment and that used for the reception of high resolution data from the NOAA WXSATs. This is under preparation. I had planned to provide further details of my own Timestep PDUS system, but mechanical problems with the mount stopped me using the system several months ago, and I have been unable to obtain replacements. The second part of Peter Hayes' home-built PDUS system should be included next month.

Kepler Elements

- 1: For a print-out of the latest WXSAT elements, send an s.a.e. and separate, extra stamp. All WXSATs plus MIR are included, together with transmission frequencies if operating. This data originates from NASA.
- 2: I now send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (plus four self-addressed, stamped envelopes) for four editions. Overseas readers can be catered for by including the appropriate number of international reply coupons.
- 3: You can have a computer disk file containing recent elements for the WXSATs, and a large ASCII file holding elements for thousands of satellites. A print-out is included, identifying NASA catalogue numbers (for the WXSATs, Amateur Radio satellites, and others of general interest), ideal for computer data retrieval. This is constantly being improved. Please enclose cash, a cheque, or PO for £2 with your PC-formatted disk and suitable stamped package.

Frequencies

NOAAs 9, 11 and 14 a.p.t. on 137.62MHz; NOAAs 10 and 12 on 137.50MHz; NOAA beacons on 136.77 and 137.77MHz; METEOR 3-5 on 137.85MHz; METEORs also use 137.30 and 137.40MHz and OKEAN-4 may use 137.40MHz occasionally.

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Decode

All the Data Modes

Les Crossan of Wallsend is one of the Decode regulars and keeps me well supplied with information. In his latest letter Les expresses his concern at the loss of utilities from the h.f. bands. Not only is Offenbach and Bracknell under threat, but NAM US Navy and Reykjavik are also due to go to satellite. Despite all these losses there is still life out there - you just have to look a bit harder. One area that may bring some fruit is satellite reception from the various military and communications satellites. I've already spent a lot of time scanning the Ku band TV satellites and, if there is anything of interest, it's always digitally encoded. There are various rumours around concerning the decodability of military and communications satellites - if you have any firm information please drop me a line.

Jonathan Bowes is currently studying for a PhD degree in wind speed meteorology at Sterling University and has e-mailed me asking if his basic receive set-up could be used for weather decoding. At the time of writing his station comprised a Sangean ATS-803A receiver with a 15m wire antenna and a 486SX PC. Fortunately for Jonathan this is an ideal starting point, providing he can keep interference from the computer under control. All he needs to complete the set-up are a few Decode special offers. HAMCOMM and JVFAX will provide the decoding software and an interface from Pervisell Electronics will complete the connection. As a new comer to utilities, Jonathan will probably need the help offered by the Day Watson Beginners List and the Decode List. FactPack 1 could also be useful to help with computer interference and FactPack 4 will guide him through to receive his first signals with HAMCOMM and JVFAX.

B. Parylo of Bingley was inspired to write following my December Decode item Life Without a PC. He currently runs an Amiga A-500 and wonders why there is so little software available. I have some good news as the CQ Centre, featured later in the column, has Amiga radio software on-line ready for downloading - all you need is a modem!

Ian Mason has written pointing out that Northwood (GYA) RN Meteo FAX have closed their 6.446MHz frequency and moved to 6.4525MHz.

Oops!

In last months section dealing with radio software on the Internet, I gave Fred Groeten a mention as a contributor. Those of you with a splattering of Dutch will no doubt have noticed that groeten is Dutch for greetings. Yes, I mis-read Fred's letter and his real name is **Fred Popp**. I never was very good at languages - sorry Fred!

What Decoder

As my FactPacks seem to be popular, I think it's about time I put together a What Decoder edition. The idea will be to follow the format used by many magazines so there will be a short review followed by the specification. I would hope to cover all the current decoding systems and maybe a few that are no longer available, but still in regular use. Whilst I already have much of the data through my own reviews, I thought it might be useful to include readers views on the various systems and the standards of service offered by the suppliers. So I would be grateful if any of you could supply me the following basic information for any decoders you own or have owned:

Make/Model
Supplier
Receiver
Antenna
Decoding performance
Best points
Worst points
Back-up service quality

When commenting on the performance I'm particularly interested in the ease of use as well as its effectiveness as a decoding system. If you had to refer back to the supplier for support I would like to hear your opinion of the service. I need comments on all types of decoder from the most humble through to top flight systems, so please don't feel your set-up isn't worthy. Once I have sufficient comments, I'll complete the FactPack and make it available through the column.

Lynchline

Martin Lynch has just opened-up a brand new Bulletin Board System (BBS) for his customers to give access to the very latest information on both new products and second-hand equipment. This should prove

very useful for Decode readers because, in addition to receivers and accessories, Martin stocks many utility decoding systems, including the comprehensive Universal range of stand-alone and PC based decoders. When I spoke to Martin at the end of January he had received nearly 200 calls, and that was before the number was advertised! In addition to full product details, Martin will be including equipment reviews to give customers all the information they need before parting with their hard earned cash. There will also be a messaging system for passing feedback and information requests to Martins sales and support teams.

The service details are:

Phone Number 0181 566 0000
Bit rate 1200-28800bits/s
Data format 8 bit, no parity,
1 stop bit

To access the BBS you will need a modem and a suitable communications program for your computer. If you're thinking of buying a new modem, I can thoroughly recommend the US Robotics Sportster 14.4 as being excellent value for money (around £120). You should be able to use the simplest of communications programs to access the BBS, but the best results come when using a program that supports ANSI terminal emulation.

Internet Help

I'm receiving lots of queries from readers who want to know more about the Internet. Queries range from how to join through to what to find when you get there. Over the past few months I've built-up a lot of information on service suppliers, software and where to look on the Internet. The latest FactPack (No 6) pools this information to guide you through to successful and economical use of the Internet.

Bracknell Change

Those of you who regularly monitor the SYNOP and SHIP weather reports from Bracknell on 4.489MHz may already have noted that the baud rate was increased to 75 baud on 1 February 1995. Thanks to **Bill Clark** of Aspatria for a timely reminder of this change.

FAX Problems

For this month's topic I thought I'd take a closer look at FAX signals and try to explain some of the common

problems encountered by readers. However, before I deal with the problems, let's run through the FAX transmission and reception process as you'll need an appreciation of this to fully appreciate the problems.

Although modern FAX systems use computers, the process is much easier to understand by referring to the older mechanical systems. In this case we start with a paper FAX chart which has all the necessary data entered and ready for transmission. This FAX chart is wrapped around a rotating drum with a rotational speed of 60, 90, 120 or 240r.p.m. If you've used FAX before you will no doubt recognise the speeds as those used for modern FAX signals. Once the chart is fixed to the drum, it's spun up to speed and is ready for scanning. The conversion of the black and white print into an electrical signal is done by slowly moving an optical sensor along the length of the drum. The principle is rather like the early phonograph where a stylus followed a spiral track on the recording drum. In the case of the FAX machine, a worm gear is normally used to control the movement of the sensor along the drum. If we were to unwrap the chart from the drum the optical sensor would have effectively followed a series of diagonal lines running from left to right on the chart - rather like a TV picture.

If the machine at the receiving end of the link is to reproduce an exact copy of the original image, both the speed of the drum and optical sensor need to be closely controlled. Whilst the drum speed is relatively simple, linking the speed of the sensor is a little more difficult. The term used to describe this movement is the index of co-operation or IOC. This figure is the length of one scan line multiplied by the number of scanning lines per unit of length. Don't worry if you don't understand the maths, it doesn't really matter. The important point about the IOC is that it enables the reception of correctly proportioned charts even when the receiver is using different sized paper than the original.

To give you some idea of the sizes of commercial gear, Joerg Klingenfuss in his *Guide to FAX Stations* states that drum scanners are typically 152mm in diameter and 660mm long. As most listeners receive FAX on a computer screen or A4 printer paper, you can see how important it is to have a system where the image proportions can be maintained regardless of the final image size.

With the basic FAX format established, let's now look at how the output from the optical sensor is converted into a radio signal. The process is actually very simple and uses frequency modulation. This is where the frequency of the transmitted signal is varied in sympathy with the output from the optical sensor. In a typical h.f FAX transmitter the maximum frequency variation is just 800Hz from black to pure white with the higher frequency normally used for white.

Receiving FAX signals is very easy using a standard short wave receiver set for s.s.b. reception. When correctly tuned, the receiver output comprises an audio tone that varies by the same 800Hz described earlier. It is this audio tone that's used by the decoder to reconstruct the original image.

Although this covers a basic FAX system, there are still a number of problems to overcome. The most important of these is synchronising your receiver with the transmitter. If we don't do this you'll find that the edge of the FAX chart doesn't align with the edge of your screen or paper. Most decoding systems handle this with some form of synchronisation control. Typically this will show a marker on the screen or paper and you position this to align with the edge of the image. From this the program can work out the correct synchronisation point and display the image properly. This is all rather tedious so you will be pleased to hear that there is an automatic picture transmission (APT) system that ensures the correct mode and synchronisation is used.

The system commences by sending a start tone to indicate the IOC of the image. The international standard is to use 300Hz for an IOC of 576 and 675Hz for 288. This start tone is then followed by a thirty second phasing signal that alternates between black and white at the intended line rate (60, 90, 120 or 240 lines per minute). Once the image transmission is complete a 450Hz stop tone is transmitted to complete the process. Although very simple, the system appears to work very successfully on the h.f. bands.

That completes the overview of a typical h.f. FAX system, so let's now take a look at some of the common problems.

Looking through the range of charts I receive, it's clear that listeners often have trouble with proper synchronisation of the FAX image. In most cases the basic edge synchronisation is OK, but the image is often skewed. This is caused by the decoders drum speed being slightly adrift from that used by the transmitter. The problem is usually easily cured by adjusting a correction factor in the decoder. Whilst some systems require you to alter the correction factor by trial and error, with JVFAX and other more sophisticated systems you can alter the settings from the main receive screen.

Next in the list of common problems come blurring or smearing of the FAX image. In mild cases this appears as a simple second image just slightly displaced from the original, but it can look as though someone has smudged the ink just after printing! The cause of both these effects is what's known as multi-path reception. Quite simply this is where the signal from the transmitter arrives over more than one path. There are many potential causes, but on h.f. they are directly related to propagation conditions. If the signal bounces of different layers of the ionosphere at the same time each of the resultant signals will suffer different transmission delays. This is the most common cause of the severe smudging that can occur. Another common scenario is to receive the signal via and single hop through the ionosphere and by direct ground wave. In this case the result is normally a second, ghost, image of the original but displaced slightly to the right. If you wanted to be clever you could use the distance between the two images to work out the time delay of the second image!

The only real solution to multipath reception problems is to use another frequency. This is one of the reasons why most of the major meteorological stations transmit on a number of different frequencies. There is another more obscure cause of image ghosting that can occur with external audio filters. If you use a RTTY filter configured as two separate bandpass filters you will usually find that the two filters introduce different delay times. It is this effect that can cause a form of ghosting. This does not normally happen on more conventional filters that use a single bandpass arrangement. You can easily test for this effect by switching the filter in and out of circuit and noting the difference.

Finally, the old chestnut of image resolution. Many listeners with an interest in meteorology write with disappointment at the lack of readable detail on the more complex charts. The key to this loss of detail starts with the image compression that occurs with most decoding systems. I touched on this earlier whilst describing the size of the original charts. In a typical system the original 660 x 478mm chart will be printed-out on A4 paper measuring just 297 x 210mm. That represents a reduction of around five times. To obtain the same detail as the original image, your decoder/printer would need to have five times the resolution of the transmitter's FAX scanner. In practice this is rarely, if ever, achieved. However, all is not lost as you can overcome the problem with some computer based decoders by zooming-in on the image. This enables you to print-out sections of the image at close to the original size, so reducing the demands on your printing system. The only weakness lies in the decoder and its ability to resolve and store the fine

detail. One of the ways you can help this is by keeping the receiver bandwidth as wide as possible. You also need to be very careful when using external audio filters. If you set these too tight you will lose detail in the image.

That about concludes this section, but if you have any further queries for me to tackle through the column, please drop me a line.

CQ Centre BBS

I notice from the Winter edition of *Datacom* that the CQ Centre BBS is celebrating its anniversary during February 95. The CQ Centre operates a Bulletin Board System (BBS) that specialises in all aspects of amateur radio and short wave listening. Access to the BBS is totally free 24 hours a day (you only pay for the telephone call charges) and it can operate with any standard modem with speeds in the range 300 to 14400bps. Like most BBS systems, ANSI graphics are supported and the communications settings appear to be 8 bit, no parity and 1 stop bit. I have tried accessing the system and it appears to be very good with lots of information and software available for downloading. One particularly good point was the inclusion of a comprehensive range of software for Amiga computers as well as the usual IBM PC programs. For those who'd like to try the service the numbers to dial are (01753) 595468 or (01753) 593524.

Special Offers

Here's a summary of the latest special offers for Decode readers. Although I will try to turn orders around in a day or two, I'm often inundated with requests so please allow up to two weeks for delivery.

1. **JVFAX 7.0** - FAX & SSTV transceiver for IBM compatible computers.
2. **HAMCOMM 3.0** - RTTY, CW & AMTOR transceiver also for IBM compatible computers.
3. **Day Watson Beginners Frequency List v1.95** - LATEST VERSION
4. **Decode Frequency List v1.95** - TOTALLY REVISED
5. **FactPack 1 Interference** - Help with those difficult computer interference problems.
6. **FactPack 2 Decoding Accessories** - A run through some of the popular accessories.
7. **FactPack 3 Starting Out** - Basic guidance for newcomers to utilities.
8. **FactPack 4 JVFAX and HAMCOMM Primer** - Receiving your first FAX and RTTY signals.
9. **FactPack 6 Internet Starter** - Basic guidance to get you started on The Internet.

To receive any of these offers just send a self-addressed sticky label plus 50p per item (£1.50 for four, eight for £3.00, etc.). If you're ordering JVFAX or HAMCOMM you will also need to send a blank, formatted 3.5in 720K disk for each program or just one 1.44Mb high density disk.

Frequency List

This month's selection of hot frequencies comes thanks to Les Crossan, **Day Watson, Martin van Duinen, David Holman**

Freq (MHz)	Mode	Speed	Shift	Call	Time	Notes
0.518	NAVTEX	100	170	GCC	-	Cullercoats
2.6185	FAX	120	576	GFE	1900	Bracknell met
3.357	FAX	120	576	NAM	1900	US Navy Norfolk
4.489	RTTY	75	400	GFE	1400	Bracknell met
4.590	Piccolo 12	40	-	-	1625	-
4.610	FAX	120	576	GFE	1500	Bracknell met
5.2625	FEC-A	143	83	-	1420	-
6.570	Twinplex CIS	200	-	-	1200	-
6.9185	FAX	120	576	-	1900	Spain met
8.1466	FAX	120	576	-	1300	Rome met
9.220	FAX	120	576	RCH72	1955	Novosibirsk meteo
9.278	RTTY	100	400	OMZ	0739	Czech foreign ministry
10.634	RTTY	50	400	CNM37.9X	1543	Rabat press
10.865	FAX	120	576	-	1400	US Navy Norfolk
11.564	ARQ-M4	192	85	RETGSZA	1200	Military - Santa Cruz
12.2125	RTTY	50	400	Y203	1630	TANJUG Belgrade
14.367	RTTY	75	400	BZP54	1210	Beijing Press
14.404	CIS Piccolo	40	-	-	1220	-
16.318	Coquelet 8	26.6	-	-	1520	-

LM&S

Long, Medium and Short Waves

By international agreement the time system used by short wave broadcasters is Universal Co-ordinated Time (UTC), which is, for most practical purposes, the same as Greenwich Mean Time (GMT). The basic difference is that UTC is derived from highly accurate Atomic Standards, whereas GMT was determined by the passing of the sun over the Greenwich Meridian at noon.

Clocks in the UK display GMT (=UTC) during the winter, but in the spring, summer and autumn they show British Summer Time (BST), which is one hour ahead of GMT. Provisionally, BST will commence this year on March 26. To avoid confusion, always quote UTC in your reports for LM&S.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless stated, all logs compiled in the four weeks ending December 31.

In some areas Atlantic 252 in Clarkstown, S.Ireland on 252kHz is so potent at night that the reception of co-channel transmissions from distant places is impossible. Furthermore, the sideband splatter makes it very difficult to receive signals on adjacent channels. Such problems are usually encountered by **Eddie McKeown** in Newry, but while Atlantic 252 was off the air for maintenance on December 18 he heard Taldom, Russia on 261. He rated the 2500kW transmission SINPO 35233 at 0227.

Medium Wave Reports

An improvement in the propagation at night of m.w. signals over transatlantic paths was evident in December. Conditions were sufficiently good on the 16th to allow **Harry Richards** (Barton-on-Humber) to tune to WSSH in Boston on 1510 and listen to President Clinton's speech about tax cuts. At 0205 their signal peaked 34333. He heard WTOP in Washington on 1500 at 0214, which rated 32222.

A news bulletin and weather report broadcast by WTOP was heard by **David Edwardson** in Wallsend on December 22 - by 0340 their signal was 34443. At 0345 he listened to an American Football phone-in from WWKB in Buffalo on 1520. It rated 24542. WSSH was logged as 35543 at 0355, with a programme in Spanish. A clear ident, followed by a news bulletin, was heard at 0400 from WQEW in New York on 1560.

Over in Co.Fermanagh **Paul Logan** (Lisnaskea) logged New York's WFAN 660, WOR 710, WCBS 880,

WINS 1010, WEVD 1050, WBBR 1130 and WQEW 1560; also from other areas WEI 850, WBAL 1090, WHAM 1180, WEGP 1390, WLAM 1470, WTOP 1500, WSSH 1510, WWKB 1520 and WPTR 1540. From E.Canada he noted CJFX 580, VOCM 590, CBNA 600, CBN 640, CKGA 650, CKVO 710, CHCM 740, CBGY 750, CJCH 920, CFBC 930, CJYQ 930, CBM 940, CHUM 1050, CBA 1070, CBI 1140, CHRМ 1290, RFO 1375, CFDA 1380, CBG 1400, CIGO 1410 and CBJ 1580. From C.America he heard TWR N.Antilles 800; Harbour Light, Grenada 1400; VOA Antigua 1580; also Caribbean Beacon, Anguilla 1610. From S.America, R.Vibracion, Venezuela 1470 and R.Dos Mil, Venezuela 1500.

In the reverse direction, **Alan Roberts** (Quebec) picked up a broadcast from Virgin Radio, UK on 1215 during the night of November 24. At the end of a song he heard a male DJ say "The best new music plus a £5000 guarantee on Virgin". Soon after the next song had started it faded out! The combined signal from the six high power transmitters on that frequency rated SIO122.

The sky waves from several stations in the Middle East and N.Africa were heard after dark by UK listeners, see chart. Since the broadcasts from AIR via Nagpur, India were received on 1566 by **Roy Merrall** in Dunstable (LM&S, SWM Dec '94), Paul Logan has checked that frequency most evenings. He picked them up several times in December - a typical rating at 2230 was 22322. On that frequency he has also been hearing R.Atlantico, Azores at 2100 and later, Bandar-Abbas, Iran with a clear ident in Farsi at 0100 - both were 33333. He says, "The other channel to watch is 1386 - the 20kW outlet of the Kenya BC at Nakuru is often audible here around 0100-0300. Reception depends upon whether ERA-2 from Athens is on or off air".

In Austria, the medium wave service provided by Osterreichischer Rundfunk (ORF) is being closed down. In future, all domestic broadcasts from ORF will be in the v.h.f. band, using frequency modulated (f.m.) transmitters. The closure of their 600kW outlet at Wien on 1476 has enabled **Bernard Curtis** (Stalbridge) to receive after dark ILR Mercury Extra via Guildford (0.5kW) on 1476. Listeners may find it worthwhile to check 585, 1026, 1314 and 1476, all of which were used by ORF.

During daylight, **George Millmore** (Wootton, IoW) received exceptionally strong ground waves from many continental stations. Some caused considerable interference to the local radio broadcasts that he can

Long Wave Chart

Freq kHz	Station	Country (kW)	Power	Listener
153	Bechar	Algeria	1000	I*
153	Donebach	Germany	500	B,D*,E,F,G,I*
153	Brasov	Romania	1200	B*,E*,FG
162	Allouis	France	2000	A*,B,D*,E,F,G,H,I*
171	Nador Medi-1	Morocco	2000	B*,F,I*
171	Kaliningrad	Russia	1000	B,E,F,G,H
177	Oranienburg	Germany	750	B,D*,E*,F,G*,H,I*
183	SaarLouis	Germany	2000	A*,B,D*,E,F,G,H,I*
198	Droitwich BBC	UK	500	B,D,E,F,H,I
207	Munich	Germany	500	B,E,F,G,H,I*
207	Azilal	Morocco	800	G*
207	Kiev	Ukraine	500	F
216	Roumoules RMC	S.France	1400	B,D,E,F,G,H,I*
216	Oslo	Norway	200	B*,C*,D*,E*,F
225	Raszyn Resv	Poland	?	B,D*,E,F,G,I*
234	Beidweiler	Luxembourg	2000	B,D*,E*,F,G,H,I*
234	St.Petersburg	Russia	1000	E
243	Kalundborg	Denmark	300	B,D*,E*,F,G,I*
252	Tipaza	Algeria	1500	B*,D*,E*,F*,G*,I*
252	Atlantic 252	S.Ireland	500	A*,B,D*,E,F,G,H,I
261	Burg (R.Ropa)	Germany	200	B*,F,I*
261	Taldom Moscow	Russia	2000	D*,E*,G*
270	Topolna	Slovak Rep	1500	B,C,D*,E*,F*,G*,H,I*
279	Minsk	Belarus	500	B,E*,F,G

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

Listeners:

A: Tim Allison, Middlesbrough.
B: Martin Dale, Stockport.
C: John Eaton, Woking.
D: Sheila Hughes, Morden.

E: Eddie McKeown, Newry.
F: George Millmore, Wootton, IoW
G: Fred Pallant, Storrington.
H: Tom Smyth, Co.Fermanagh.
I: Andrew Stokes, Leicester.

normally receive. For example, BBC R.Devon & Dorset on 855 was obliterated between 0900 and 1000 on December 15 by co-channel RAIS Berlin, rated SIO434 and RNE1, rated SIO555. Usually R.Devon & Dorset is SIO434 at that time.

Up in Largs **John Stevens** has been hearing BBC Radio Kent via Rusthall (0.25kW) on 1602 most mornings. Usually their signal is SIO323 until about 1030, but often there is interference from a Spanish station. Their broadcasts have also been received by **Arthur Grainger** in Carstairs Junction. He compiled an extensive local radio log during daylight and after dark, see chart.

Darren Beasley (Bridgwater) has informed me that Gemini AM have now taken over the outlets at Exeter on 666 and Torbay on 954, which were vacated by DevonAir Radio when they lost their licence.

Short Wave Reports

During much of December conditions in the higher frequency bands were poor and no reliance could be placed on receiving a particular broadcast.

The **25MHz (11m)** band is no longer being used by international broadcasters.

Conditions in the **21MHz (13m)** band varied considerably from day to day. Often they were poor, but when favourable R.Australia's broadcast to Asia via Darwin on 21.725 (Eng 0630-1100) could be heard in the UK. It was 35444 at 0912 by **Tim Allison** in Middlesbrough; 35553 at 0921 in Wallsend; SIO343 at 1000 by **Kenneth Buck** in Edinburgh; SIO333 at 1035 by **Bill Clark** in Rotherham.

Also noted here in the morning were R.Japan via Yamata 21.610 (Eng to SE.Asia 0600-0800) rated SIO222 at 0649 by **Frederic Collin** in Tokyo & via Moyabi 21.640 (Jap to Eu, M.East 0800-0900) 24122 at 0810 in

Newry; DW via Wertachtal? 21.600 (Eng to S/E.Africa 0900-0950) 35322 at 0939 by **Gerry Haynes** in Bushey Heath & via Julich? 21.560 (Ger to Asia 1000-1400) SIO232 at 1012 by **Rhoderick Illman** in Oxted; BSKSA via Riyadh 21.495 (Ar [Holy Quran] to SE.Asia 0900-1200) 45444 at 1030 by **John Eaton** in Woking; UAER, Dubai on 21.605 (Eng to Eu 1030-1055) 43333 at 1030 by **Sheila Hughes** in Morden; R.Ukraine Int 21.800 (Uk 0900-1700?) SIO322 at 1115 by **Philip Rambaut** in Macclesfield; Vatican R, Italy 21.850 (Sp to C/S.Am 1100-1215) SIO333 at 1120 in Macclesfield.

During the afternoon UAER, Dubai 21.605 (Eng to Eu 1330-1355) was logged as 43334 at 1340 by **Martin Dale** in Stockport; R.Portugal Int via Sines 21.515 (Port, Eng to M.East, India? 1330?-1500) was 22222 at 1430 in Newry; BBC via Ascension Is 21.660 (Eng to W/E.S.Africa 1100-1700) 24333 at 1548 by **Fred Pallant** in Storrington & via Limassol 21.470 (Eng to E.Africa 1400-1615) SIO444 at 1610 by **John O'Halloran** in Harrogate; WYFR via Okeechobee, USA 21.745 (Eng to Europe 1600-1645) 35323 at 1612 in Bridgwater and 21.525 (Eng, Fr, Ger, Port to W.Africa 1600-2045?) 43333 at 1615 in Stalbridge; Monitor R.Int via WSHB Cypress Creek 21.640 (Eng to E.Africa 1600-1850?) 45444 at 1640 by **Michael Griffin** in Ross-on-Wye; HCJB Quito, Ecuador 21.455 (Eng, u.s.b. + p.c.) 24442 at 1650 by **Robert Connolly** in Killeel.

Conditions in the **17MHz (16m)** band also varied from day to day. Sometimes R.Australia's broadcast to N.Asia via Carnarvon 17.715 (Eng 0200-0400, 0500-0900) reached our shores in the morning. During favourable conditions it peaked 45343 at 0755 in Bushey Heath. In Tokyo it was a potent SIO555 at 0718!

Also received here before noon were R.Pakistan, Islamabad 17.900 (Eng to Eu 0800-0845), noted as

Medium Wave Chart

Freq kHz	Station	Country	Power (kW)	Listener	Freq kHz	Station	Country	Power (kW)	Listener	Freq kHz	Station	Country	Power (kW)	Listener
520	Hof-Saale (BR)	Germany	0.2	D*,J*	882	COPE via ?	Spain	?	B*,D*,J*,K	1350	Nancy/Nice	France	100	C*,D*,J*,K,Q*
531	Ain Beida	Algeria	600	B*,D*,K*,Q*	882	Washford (BBCWales)	UK	100	D,G,K,P,Q*	1359	Arganda (RNE-FS)	Spain	600	B*,D*,J*,K*,Q*
531	Lelzig	Germany	100	D*,J*,K*,Q*	891	Algiers	Algeria	600/300	B*,D*,E*,K,Q*	1368	Foxdale(Manx R)	IoM	20	D,F,G,K*,P
531	RNE5 via ?	Spain	?	B*,K*	891	Huisberg	Netherlands	20	J*,K	1377	Lille	France	300	J*,K,Q*
531	Beromunster	Switzerland	500	H	900	Milan	Italy	600	A*,B*,D*,J*,K	1386	Nakuru(KBC)	Kenya	20	I*
540	Wavre	Belgium	150/50	B*,D,H,J*,K,P,Q*	900	CDPE via ?	Spain	?	D*,K,Q*	1386	Bolshakovo	Russia	2500	B*,J*,K,P*
540	Sidi Bennour	Morocco	600	B*,D*,K*	900	Qurayyat	S. Arabia	1000	K*	1386	R.Ned via B'shakovo	Russia	2500	C*
549	Les Trembles	Algeria	600	B*,D*,E*,K,Q*	909	B'mans Pk(BBC5)	UK	140	D,K,Q*	1395	Lushnje(Tirana)	Albania	1000	B*,G*,J*,K*,P*
549	Thurmau (DLF)	Germany	200	A*,D*,G*,J*,K*,Q*	909	M'side Edge(BBC5)	UK	200	P	1404	Brest	France	20	B*,J*,K,Q*
558	Espoo	Finland	100	B*,D*	918	Plesivec(Sloven'rN)	Yugoslavia	600/100	B*,D*,J*,K*	1413	RNE5 via ?	Spain	?	B*,D*,K*,Q*
558	Rostock (NDR)	Germany	20	J*	918	Madrid(R.Int)	Spain	20	B*,D*,J*,K*,Q*	1422	Alger	Algeria	50/25	B*,K*
558	Tirgu Jiu	Romania	200	K*	927	Wolvertem	Belgium	300	D*,J*,K,Q*	1422	Heusweiler(DLF)	Germany	1200/600	D*,J*,K,Q*
558	RNE5 via ?	Spain	?	B*,D*,J*,K,Q*	936	Bremen	Germany	100	D*,J*,Q	1431	Nikolayev	Ukraine	400	J*
567	Berlin	Germany	100	J*	936	Venezia	Italy	20	K*	1440	Marnach(RTL)	Luxembourg	1200	C*,D,K,N
567	Tullamore (RTE1)	Ireland (S)	500	A,C*,D,H,K,P,Q*	936	RNE5 via ?	Spain	?	B*,D*,P*,Q*	1449	Squinzano	S. Arabia	1600	B*,N*
567	RNE5 via ?	Spain	?	J*,K*	945	Toulouse	France	300	J*,K	1458	Lushnje(Tirana)	Albania	500	Q*
576	Muhlacker (SDR)	Germany	500	D*,H,J*,K,Q*	954	Brno(Dobrochov)	Czech Rep.	200	D*,K	1467	Monte Carlo(TWR)	Monaco	1000/400	G*,J*,K,P*
576	Riga	Latvia	500	K*	954	Madrid(CI)	Spain	20	B*,D*,J*,K*,Q*	1476	Wien-Bisamberg	Austria	600	B*,D*,J*,K*,Q*
576	Barcelona (RNE5)	Spain	50	B*,D*,K*	963	Pon	Finland	600	A*,B*,D*,J*,K*	1485	AFN via ?	Germany	1	Q*
585	Paris (FIP)	France	8	D*,E,K	963	Paris	France	8	K*	1485	SER via ?	Spain	?	B*,D*,K*,Q*
585	Madrid (RNE1)	Spain	200	B*,D,H,J*,K,Q*	963	Tir Chonaill	Ireland (S)	10	K*,P,Q*	1494	Clermont-Ferrand	France	20	K
585	Gafsa	Tunisia	350	K*	963	Tunis-Djedeida	Tunisia	200	K*	1494	St.Petersburg	Russia	1000	B*,J*,K*
585	Dumfries (BBCScot)	UK	2	D*,P	972	Hamburg(NDR)	Germany	300	D*,J*,K*,P*,Q*	1503	Stargard	Poland	300	J*
594	Frankfurt (HR)	Germany	1000/400	D,H,J,K,Q*	972	RNE1 via ?	Spain	?	B*,J*,K	1503	RNE5 via ?	Spain	?	D*,Q*
594	Dujda-1	Morocco	100	B*,K*	981	Alger	Algeria	600/300	B*,D*,J*,Q*	1512	Wolvertem	Belgium	600	C*,D,G*,J*,K, M*,P*,Q*
594	Muge	Portugal	100	B*,D*,K	981	Megara	Greece	200	D*,Q	1512	Jeddah	S. Arabia	1000	Q*
603	Lyon	France	300	K	990	Berlin	Germany	300	D*,K,Q*	1521	Kosice(Cizaitice)	Slovakia	600	B*,J*,K*
603	Sevilla (RNE5)	Spain	50	B*,D*,J*,K*,P*	990	R.Bilbao(SER)	Spain	10	B*,D*	1521	Duba	S. Arabia	2000	B*,K*,Q*
603	Newcastle (BBC)	UK	2	C*	990	Redmoss(BBC)	UK	1	A	1521	R.Mansara(SER)	Spain	2	Q*
612	Athlone (RTE2)	Ireland (S)	100	D,H,K*,P,Q*	990	Schwerin (RIAS)	Germany	20	B*,D*,J*	1530	Vatican R	Italy	150/450	B*,D*,J*,K*,Q*
612	RNE1 via ?	Spain	10	B*,D*,Q*	999	Madrid(COPE)	Spain	50	B*,D*,J*,P*	1539	Mainflingen(DLF)	Germany	700	A*,D,J*,K,P*,Q*
621	Wavre	Belgium	80	B*,D,H,J*,K,Q*	1008	Las Palmas(SER)	G. Canaria	?	J*,Q*	1539	Valladolid(SER)	Spain	5	K
621	Barcelona (OCR)	Spain	50	B*,D*,E,K	1008	Flevo(Hilv-5)	Holland	400	A*,D,G*,J*,K	1557	Nice	France	300	D*
630	Vigra	Norway	100	B*,D*,J*,K*,P,Q*	1017	Rheinsender(SWF)	Germany	600	A*,D*,J*,K*,Q*	1557	Kaunas (R.Vilnius)	Lithuania	75	J*
630	Tunis-Djedeida	Tunisia	600	B*,D*,K*	1017	RNE5 via ?	Spain	?	B*,K*	1566	Vila de Porto	Azores	10	I*
639	Praha (Liblice)	Czech	1500	B*,K*	1026	Graz-Dobl	Austria	100	B*,J*,K*	1566	Nagpur	India	1000	I*
639	RNE1 via ?	Spain	?	B*,D*,G*,H,J*,K,Q*	1026	SER via ?	Spain	?	D*	1566	Bandarabbas	Iran	100	I*
648	RNE1 via ?	Spain	10	B*,D*,Q*	1035	Lisbon(Pro3)	Portugal	120	B*,D*,K*	1566	Sfax	Tunisia	1200	B*
648	Orfordness (BBC)	UK	500	D,K,Q*	1044	Oresden	Germany	250	J*,K	1575	Genova	Italy	50	B*,J*,K*,L*
657	Napoli	Italy	120	J*,K	1044	Sebaa-Aioun	Morocco	300	J*,Q*	1575	SER via ?	Spain	5	B*,K,L*,Q*
657	Madrid (RNE5)	Spain	20	B*,K,Q*	1044	S.Sebastian(SER)	Spain	10	B*,D*,J*,K	1584	SER via ?	Spain	2	B*,J*,K
657	Wrexham (BBCWales)	UK	2	D,E,Q	1053	Tanger	Morocco	600	B*,Q*	1593	Holzkirchen(RFE)	Germany	150	D*,J*,K*
666	Bodensees'dr (SWF)	Germany	300/180	B*,J*,P*	1053	Iasi	Romania	1000	K*	1602	SER via ?	Spain	?	B*
666	R.Vilnius	Lithuania	500	J*	1053	Zaragoza(COPE)	Spain	10	B*,D*,G*,J*,K,Q*	1602	Vitoria(EI)	Spain	10	B*
666	Lisboa	Portugal	135	B*,K*	1062	Kalundborg	Denmark	250	A*,B*,D*,J*,K,P	1611	Vatican R	Italy	15	J*,Q*
666	Barcelona (COPE)	Spain	10	B*	1071	Brest	France	20	B*,K					
675	Marseille	France	600	B*,D*,K*,P	1071	France-Inter	France	?	C*					
675	Lopic (R10 Gold)	Holland	120	A,B*,D*,J*,K,N,Q*	1071	Lille	France	40	J*,Q*					
684	Sevilla (RNE1)	Spain	500	B*,D*,J*,K*,Q*	1071	Bilbao(EI)	Spain	5	B*,D*,J*,K*,Q*					
684	Avala (Beograd-1)	Yugoslavia	2000	B*,D*,J*,K*	1080	Katowice	Poland	1500	B*,D*,J*,K					
693	Droitwich (BBC5)	UK	150	D,K,Q*	1080	SER via ?	Spain	?	B*,D*,J*,K*					
693	Stagshaw (BBC5)	UK	50	C*	1089	Dures	Albania	150	K*					
702	Fzmsburg (NDR)	Germany	5	D*,J*	1089	Krasnodar	Russia	300	B*,D*,J*,Q*					
702	Zamora (RNE1)	Spain	10	B*,D*,K	1098	Nitra(Jarok)	Slovakia	1500	B*,D*,G*,J*,K,Q*					
711	Rennes 1	France	300	D,K	1098	RNE5 via ?	Spain	?	B*,D*,G*,J*,K*					
711	Heidelberg	Germany	5	Q*	1107	AFN via ?	Germany	10	A*,D*,Q*					
711	Laayoune	Morocco	600	B*	1107	Sitkunai	Lithuania	150	K					
711	Murcia(COPE)	Spain	5	K*	1107	RNE5 via ?	Spain	?	B*,D*,J*,K					
720	Langenberg	Germany	200	K*	1116	Bari	Italy	150	B*,D*,J*,K					
720	Lisnagarvey(BBC4)	Ireland (N)	10	D*,K*,P,Q*	1116	Pontevedra(SER)	Spain	5	D*					
720	Norte	Portugal	100	B*,J*,K*	1125	La Louviere	Belgium	200	J*,K					
720	Lots Rd,Ldn(BBC4)	UK	0.5	Q	1125	Deanovec	Croatia	100	K*					
729	Cork(RTE1)	Ireland (S)	10	D,K*,P*,Q*	1125	RNE5 via ?	Spain	?	B*,D*,J*,K,Q*					
729	RNE1 via ?	Spain	?	B*,D*,J*,K,Q*	1125	Llandrindod Wells	UK	1	J*					
738	Paris	France	4	C*,K	1134	COPE via ?	Spain	2	B*,D*,J*,K,Q*					
738	Poznan	Poland	300	K*	1134	Zadar(Croatian R)	Yugoslavia	600/1200	B*,D*,K*					
738	Barcelona(RNE1)	Spain	500	B*,D*,J*,K*,Q*	1143	AFN via ?	Germany	1	A*,D*,J*,N*,Q*					
747	Las Palmas	G. Canaria	20	D*	1143	Stuttgart(AFN)	Germany	10	B*,K					
747	Flevo(Hilv2)	Holland	400	A*,B*,D*,J*,K,P,Q*	1143	COPE via ?	Spain	2	B*,K					
747	Cadiz(RNE5)	Spain	10	K*	1152	RNE5 via ?	Spain	10	B*,D*,J*,P*					
756	Braunschweig(DLF)	Germany	800/200	A*,D*,J*,K,Q*	1161	Strasbourg(Flnt)	France	200	B*,D*,J*,K*					
756	Lugoj	Romania	400	K*	1179	SER via ?	Spain	?	D*,K,Q*					
756	Bilbao(EI)	Spain	5	D*,J*,K*	1179	Santiago(SER)	Spain	10	J*					
756	Redruth(BBC)	UK	2	P*	1179	Solvesborg	Sweden	600	B*,C*,D*,J*, K,N*,P,Q*					
756	Sottens	Switzerland	500	B*,D*,J*,K,Q*	1188	Kuurne	Belgium	5	B*,D*,J*,K,Q					
774	RNE1 via ?	Spain	?	B*,D*,J*,K,Q*	1188	Reichenbach(MDR)	Germany	5	D*,Q*					
774	Plymouth(BBC)	UK	1	P	1197	Munich(VDA)	Germany	300	D*,J*,N					
783	Burg	Germany	1000	D*,J*,K,Q*	1197	Virgin via ?	UK	?	K*,P*,Q					
783	Miramar(R.Porto)	Portugal	100	K*	1197	Virgin via ?	UK	?	K*,P*,Q					
783	Dammam	S. Arabia	100	K*	1206	Bordeaux	France	100	C*,K,Q*					
792	Limoges	France	300	D*,K	1206	Wroclaw	Poland	200	B*,D*,J*,K*					
792	Lingen(NDR)	Germany	5	J*	1215	Castellon(COPE)	Spain	2	J*					
792	Sevilla(SER)	Spain	20	B*,D*,J*,K*,P*,Q*	1215	Virgin via ?	UK	?	C*,D,K,N,D*,P,Q					
801	Munchen-Ismaning	Germany	300	D*,J*,K,Q*	1224	Vidin	Bulgaria	500	K*					
801	St.Petersburg	Russia	1000	K*	1224	Virgin via ?	UK	?	P					
801	RNE1 via ?	Spain	?	B*,D*,J*,K*	1233	Liege	Belgium	5	D*,J*,K,Q*					
810	Voru	Estonia	5	K*	1233	Virgin via ?	UK	?	K*,P*,Q					
810	Madrid(SER)	Spain	20	B*,D*,J*,K,Q*	1242	Virgin via ?	UK	?	D*,P*,Q					
810	Westerglen (BBCScot)	UK	100	D,K,P,Q*	1251	Marcali	Hungary	500	B*,D*,J*					
819	Batra	Egypt	450	K*	1251	Huisberg	Netherlands	10	J*,K,Q*					
819	Toulouse	France	50	D*,K	1260	SER via ?	Spain	?	B*,D*,J*,K*					
819	Warsaw	Poland	300	D*,J*,Q*	1269	Neumunster(DLF)	Germany	600	A*,C*,D*,J*,K,Q*					
828	Hannover(NDR)	Germany	100/5	B*,D*,J*,P*	1278	Strasbourg	France	300	J*,K					
828	Barcelona(SER)	Spain	50	B*,K*	1278	Dublin/Cork(RTE2)	Ireland (S)	10	C*,D,K,P*,Q*					
837	Nancy	France	200	D*,J*,K,P*	1287	RFE via ?	Czech Rep.	400	B*,K*					
837	COPE via ?	Spain	?	B*,D*,J*,K*	1287	Melnik(RFE)	Czech Rep.	400	J*					
846	Rome	Italy	540	B*,D*,K,Q*	1287	Lerida(SER)	Spain	10	D*,K,Q*					
855	Berlin	Germany	100	J*,K	1296	Valencia(COPE)	Spain	10	B*,D*,J*,K,Q*					
855	R.Bucharest	Romania	750	P*	1296	Orfordness(BBC)	UK	500	K*					
855	RNE1 via ?	Spain	?	B*,D*,J*,K,Q*	1305	Rzeszow	Poland	100	J*					
864	Santah	Egypt	500	D*,K*	1305	RNE5 via ?	Spain	?	D*,G*,J*,K*,Q*					
864	Paris	France	300	K	1314	Kvitsov	Norway	1200	A,B*,D*,J*,K,P,Q					
864	Socuellamos(RNE1)	Spain	2	D*	1323	Wachenbrunn(VofR)	Germany	1000/150	B*					
873	Frankfurt(AFN)	Germany	150	A*,D*,J*,K, N,P*,Q*	1332	Rome	Italy	300	B*,D*,J*,K,Q*					
873	Zaragoza(SER)	Spain	20	B*,D*,J*,K*	1341	Lakihyeg	Hungary	300	J*					
					1341	Lisnagarvey(BBC)	Ireland (N)	100	A,D,K,P,Q					
					1341	Tarrasa(SER)	Spain	2	D*,K*					

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

- Listeners:**
A: Tim Allison, Middlesbrough.
B: Darren Beasley, Bridgwater.
C: Steve Brown, Newcastle-upon-Tyne.
D: Martin Dale, Stockport.
E: John Eaton, Woking.
F: Arthur Grainger, Stairs Junction

Local Radio Chart

Freq kHz	Station	ILR	e.m.r.p (kW)	Listener	Freq kHz	Station	ILR	e.m.r.p (kW)	Listener
558	Spectrum R	I	7.50	B,D,F,K,M	1161	Southern Counties R	B	1.00	B,K
585	R.Solway	B	2.00	B*,F,J*,M	1161	R.Tay	I	1.40	B*,F
603	Cheltenham (CD603)	I	0.10	D,G,K,M	1161	Humberstone (Gt.Yks)	I	0.35	A,B*,D
603	Invicta SG (Coast)	I	0.10	B,H*,K	1170	GNR Teaside	I	0.32	A,F
630	R.Bedfordshire(3CR)	B	0.20	B,D,E*,I,F,K,M	1170	Portsmouth (SCR)	I	0.12	B*,K
630	R.Cornwall	B	2.00	K	1170	R.Orwell (SGR)	I	0.28	B
657	R.Clywd	B	2.00	B,F,K	1170	Signal R (S.Gold)	I	0.20	D,M
657	R.Cornwall	B	0.50	K	1170	Swansea Sound	I	0.58	B*
666	Gemini AM	I	0.34	K	1242	Invicta Snd (Coast)	I	0.32	B,H*
666	R.York	B	0.80	A,B,D,J*,M	1242	Isle of Wight R	I	0.50	K
729	BBC Essex	B	0.20	B,E*,F*,J*,K,M	1251	Saxon R (SGR)	I	0.76	B,FH
738	Hereford/Worcester	B	0.037	B,D,M	1260	Brunel R (Cl.Gold)	I	1.60	B*,F*,K,L*
756	R.Cumbria	B	1.00	A,B*,F	1260	Marcher Snd (Gold)	I	0.64	D,F
756	R.Malwyn	I	0.63	B,D,K	1260	Sunrise R	I	0.29	B*,F*,M
765	BBC Essex	B	0.50	A,B,D,K,M	1260	R.York	B	0.50	A,F*
774	R.Kent	B	0.70	B,F*,K	1278	Bradford (Gt.Yks)	I	0.43	A,F*,K,L
774	R.Leeds	B	0.50	A,B,D,F*	1305	Barnsley (Gt.Yks)	I	0.15	A,B,D,H*,M
774	Gloucester(3CSG)	I	0.14	D,F*,G,M	1305	Red Dragon (Touch)	I	0.20	H*,K
792	Chiltern (S.Gold)	I	0.27	B,D,M	1323	R.Bristol (Som.Snd)	B	0.63	D,L*
792	R.Foyle	B	1.00	F	1323	Brighton (SCR)	I	0.50	B,E*,K
801	R.Devon & Dorset	B	2.00	D,G,J*,K	1332	Hereward R (WGMS)	I	0.60	A,B,D,F*,M
828	Chiltern (S.Gold)	I	0.20	B	1332	Wiltshire Sound	B	0.30	F*,K
828	R.Aire (Magic828)	I	0.12	A,D	1359	Essex R (BreezeAM)	I	0.28	B
828	2CR (Cl.Gold)	I	0.27	K,M	1359	Mercia Snd (Xtra-AM)	I	0.27	D*,F*,M
837	R.Cumbria/Furness	B	1.50	A,F,J	1359	Red Dragon (Touch)	I	0.20	F*,G
837	R.Leicester	B	0.45	D,K,M	1359	R.Solent	B	0.85	E,F*,K
855	R.Devon & Dorset	B	1.00	K	1368	R.Lincolnshire	B	2.00	A,B,F*,H,M
855	R.Lancashire	B	1.50	A,D,F*	1388	Southern Counties R	B	0.50	B,F*,H,K
855	R.Norfolk	B	1.50	B,M	1388	Wiltshire Sound	B	0.10	K
855	Sunshine R	I	0.15	B	1413	Sunrise R	I	0.125	B
873	R.Norfolk	B	0.30	B,D,K,M	1431	Essex R (BreezeAM)	I	0.35	B,D*,F*,K
936	Brunel R (Cl.Gold)	I	0.18	B*,G,K	1431	R.210 (Cl.Gold)	I	0.14	D*,F*,K,M
945	R.Trent(Gem AM)	I	0.20	B,D,F*,J*,K,M	1449	R.Peterboro/Cambs	B	0.15	B*,F*,K,M
954	Gemini AM	I	0.32	K	1458	Fortune	I	5.00	D,F*
954	R.Wyvern (WYVN)	I	0.16	B*,D,F*,G,K,M	1458	R.Cumbria	B	0.50	F
990	WABC (Nice & Easy)	I	0.09	D	1458	R.Devon & Dorset	B	2.00	K
990	R.Aberdeen	B	1.00	B	1458	R.Newcastle	B	2.00	B*,F*
990	R.Devon & Dorset	B	1.00	K	1458	Sunrise R	I	50.00	B,D*,E*,F*,K,L,M
990	Hallam R (Gt.Yks)	I	0.25	A,B,D,M	1476	Guildford (M.Xtra)	I	0.50	B,C*,D,F,H*,K,L*
999	R.Solent	B	1.00	B,F*,K,L	1485	R.Humberstone	B	1.00	B
999	R.Trent (Gem AM)	I	0.25	B,D,M	1485	R.Merseyside	B	1.20	D,F,L
999	Red Rose (Gold)	I	0.80	A,B*,D,F	1485	Southern Counties R	B	1.00	B,K,M
1017	Beacon R (WABC)	I	0.70	B*,D,F*,H,J*,K,M	1503	R.Stoke-on-Trent	B	1.00	B*,D,F*,H,K,M
1026	Downtown R	I	1.70	FL	1521	Reigate (M.Xtra)	I	0.64	A,B,D,F,H*,K
1026	R.Cambridgeshire	B	0.50	A,B,D,H,M	1530	Huddersfld (Gt.Yks)	I	0.74	A,B*,D
1026	R.Jersey	B	1.00	B,H,K	1530	R.Essex	B	0.15	B*,F*,K
1035	Country 1035	I	?	B,D*,F*,L	1530	R.Wyvern (WYVN)	I	0.52	F*,K,M
1035	NorthSound R	I	0.78	A,B*,F	1548	Capital R (Cap G)	I	97.50	B,K,L
1035	R.Sheffield	B	1.00	D,M	1548	R.Bristol	B	5.00	K
1035	West Sound R	I	0.32	B*,F	1548	Liverpool (City G)	I	4.40	A,B*,D
1107	Moray Firth R	I	1.50	B*,F,M	1548	R.Forth (Max AM)	I	2.20	B*,F
1116	R.Derby	B	1.20	A,B,D,F*,L*,M	1548	Sheffield (Gt.Yks)	I	0.74	A,B*,M
1116	R.Guernsey	B	0.50	B,F,K	1557	Chiltern R (Gold)	I	0.76	B,D*,F*,M
1152	BRMB (Xtra-AM)	I	3.00	F*,G,M	1557	Southampton (SCR)	I	0.50	A,D*,F*,K
1152	Great North R (GNR)	I	1.80	A	1557	R.Lancashire	B	0.25	A,B*,D
1152	LBC (LondonNewstalk)	I	23.50	B,K,L*	1557	Tendring (Mellow)	I	0.125	B,F*
1152	Piccadilly R (Gold)	I	1.50	D	1584	Kettering (KCBC)	B	0.04	B,D*,H,M
1152	R.Broadland	I	0.83	B,D*	1584	R.Nottingham	B	1.00	A,B*,D,F*,M
1152	R.Clyde (Clyde 2)	I	3.06	F	1584	R.Shropshire	B	0.50	D*
1161	Brunel R (Cl.Gold)	I	0.16	B,G,K,M	1584	R.Tay	I	0.21	F
1161	R.Bedfordshire (3CR)	B	0.10	B,M	1602	R.Kent	B	0.25	B,F,K,M

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

- Listeners:
 A: Tim Allison, Middlesbrough.
 B: Clive Boutell, Dovercourt.
 C: Bernard Curtis, Stalbridge.
 D: Martin Dale, Stockport.
 E: John Eaton, Woking.
 F: Arthur Grainger, Carstairs Junction.
 G: Francis Hearne, n. Bristol.
 H: Sheila Hughes, Morden.
 I: Rhoderick Illman, Oxted.
 J: Eddie McKeown, Newry.
 K: George Millmore, Wootton, IoW.
 L: Tom Smyth, Co.Fermanagh.
 M: Andrew Stokes, Leicester.

via Okeechobee 13.695 (Eng to N.Am 1300-1400) 35433 at 1321 in Middlesbrough; UAER, Dubai 13.675 (Eng to Eu 1330-1400) 43343 at 1333 in Newry; R.Tashkent, Uzbekistan 13.785 (Eng to S.Asia 1330-1358) 35543 at 1335 in Norwich; R.Nederlands via Flevo 13.700 (Eng to S.Asia, M.East 1330-1525) SIO333 at 1525 in Harrogate; WHRI South Bend 13.760 (Eng to E.U.S.A, Eu 1600-0000?) 44434 at 1615 by **George Tebbitts** in Penmaenmawr; WWCR Nashville 13.845 (Eng to E.U.S.A 1400-0100) 43443 at 1740 in Kilkeel; DW via Julich? 13.790 (Eng to W.Africa 1900-1950) 35333 at 1915 in Bridgwater; VOA via Selebi-Phikwe 13.710 (Eng to Africa 1630-2230) 34232 at 1940 in Oxted.

Good reception from many areas was evident in the **11MHz (25m)** band. During daylight, R.Globo in Rio de Janeiro, Brazil 11.805 (Port 0900-0330) was 44433 at 0900 in Stirling; Ulaanbaatar R, Mongolia 12.000 (Eng to Aust 0910-0940) SIO333 at 0910 in Scalloway; FEBC Philippines 11.690 (Eng to China, New Guinea 0830-1100) 44444 at 0930 in Morden; ERA Thessaloniki, Greece 11.595 (Gr to Eu 1000-2255) 34333 at 1017 in Oxted; R.Romania Int, Bucharest 11.940 (Eng to Eu 1300-1400) 54444 at 1338 in Middlesbrough; Voice of the Mediterranean, Malta 11.925 (Eng, Ar to N.Africa 1400-1600) 23222 at 1451 in Woodhall Spa; R.Australia via Carnarvon 11.660 (Eng to S.Asia 1430-1800) 35553 at 1505 in Walsend.

After dark, R.Kuwait via Kabd 11.990 (Eng to Eu 1800-2100) was SIO344 at 1801 in Edinburgh; DW via Trincomalee 11.810 (Eng to W.Africa? 1900-1950) SIO444 at 1915 in N.Bristol; R.Thailand, Bangkok 11.855 (Eng to SE.Asia? 1900-2000) 54444 at 1950 in Norwich; R.Nederlands via Talata Volon 11.655 (Eng to C/W.Africa 1930-2025) 44444 at 2013 in Ross-on-Wye; AIR via Bangalore 11.620 (Hi, Eng to Eu 1745-2230) SIO322 at 2055 in Rotherham; Israel R, Jerusalem 11.603 (Fr to W.Eu, USA 2130-2200) 43444 at 2130 in Rugby; R.Gaucha, Porto Alegre 11.915 (Port 24hrs) 22222 at 0025 in Kilkeel.

The **9MHz (31m)** band is probably the best one to choose if you wish to hear R.New Zealand's broadcasts in the UK. Although intended for Pacific areas their 100kW transmission on 9.700 (Eng 0759-1300) was rated 34433 at 0844 in Oxted, 32233 at 0925 in Stalbridge and SIO222 at 1007 in Woking.

Also logged during the daytime were R.Rumbos, Caracas 9.660 (Sp 24hrs) SIO333 at 0630 in Scalloway; HCJB Quito 9.420 (Eng to Europe?

1951 in Oxted.
 Daily variations in propagation were also evident in the **15MHz (19m)** band, but the broadcasts from a number of areas could usually be heard here. R.Australia was heard on two frequencies: 15.170 from Carnarvon (Eng to N.Asia 0900-1200), noted as 31421 at 1100 in Newry and 15.530 from Darwin (Eng to S.Asia 1100-1300), 45444 at 1110 by **James Duckworth** in Barnet.

Also noted in this band in the morning were R.Japan via Yamata? 15.335 (Eng to E.Asia? ?-0725) rated 44344 at 0710 in Norwich; BBC via Hong Kong 15.280 (Eng to Far East 0330-0915) 35333 at 0733 in Bushey Heath, via Kranji 15.360 (Eng to SE.Asia 0500-0915) SIO523 at 0755 in Tokyo & via Limassol 15.575 (Eng to M.East 0400-1500) 35443 at 0950 in Middlesbrough; AIR via Aligarh? 15.050 (Eng to NE.Asia 1000-1100) SIO222 at 1000 by **Tom Smyth** in Co.Fermanagh; UAER, Dubai 15.395 (Eng to Eu 1030-1100) 32222 at 1045 in Stalbridge; Voice of Malaysia, Kajang 15.295 (Mand to S.Asia 1030-1230) SIO343 at 1200 by **John Slater** in Scalloway.

In the afternoon the Voice of Turkey, Ankara 15.350 (Tur to Eu 0900-1600) was SIO555 at 1221 in

Macclesfield; UAER, Dubai 15.395 (Eng to Eu 1330-1400) SIO433 at 1335 in Rotherham; R.Finland via Pori 15.400 (Eng to N.Am 1330-1400) 34544 at 1347 in Storrington; Israel R, Jerusalem 15.640 (Eng to Europe, N.Am 1400-1425) 55555 at 1400 by **Clare Pinder** in Appleby; RCI via Sines? 15.325 (Eng to Eu, M.East, Africa 1430-1500?) 44444 at 1445 in Morden; R.Japan via Moyabi 15.355 (Eng to S.Africa 1500-1600) 34443 at 1500 by **Ross Lockley** in Stirling; BBC via Sackville 15.260 (Eng to N.Am 1500-1700) SIO433 at 1530 in Harrogate; WWCR Nashville 15.685 (Eng to Eu 1200-2215?) 44444 at 1536 in Stockport; WEWN Birmingham 15.695 (Eng to Eu? 1600-1658) 55545 at 1605 in Ross-on-Wye; Channel Africa via Meyerton 15.240 (Eng to Africa 1600-1700) 35553 at 1625 in Walsend; VOA via Selebi-Phikwe 15.445 (Eng, Am to Africa 1600-1900) 33233 at 1637 by **Peter Pollard** in Rugby; China R.Int via Mali 15.130 (Eng to E/S.Africa 1600-1655) 33333 at 1650 by **Vera Brindley** in Woodhall Spa.

In the evening, HCJB Quito 15.490 (Eng to Eu 1700-2000) was SIO343 at 1701 in Edinburgh; Africa No.1, Gabon 15.475 (Fr to W.Africa 1600-1900) 34343 at 1723 in Woking; WHRI

South Bend 15.105 (Eng to C/S.Am 1400-1800) 32332 at 1735 in Kilkeel; RNB Brazil 15.265 (Eng, Ger to Eu 1800-2020) 35433 at 1800 in Bridgwater; BBC via Ascension Is 15.400 (Eng to Africa 1500-2300) SIO444 at 1900 by **Francis Hearne** in N.Bristol; R.Nederlands via Bonaire 15.315 (Eng to W.Africa 1830-2025) 43333 at 1951 in Oxted.

Some of the broadcasts in the **13MHz (22m)** band in the morning come from R.Austria Int via Moosbrunn 13.730 (Ger, Eng, Fr, Sp to Eu 0400-1800), SIO444 at 0830 in N.Bristol; Monitor R.Int via KHBI Saipan 13.615 (Eng to Oceania 0800-1000) SIO423 at 0838 in Tokyo and 34433 at 0950 in Bridgwater; R.Korea via Kimjae 13.670 (Eng to Eu 0800-0900) 43333 at 0857 in Norwich; R.Australia via Darwin on 13.605 (Eng to Asia 0900-1000, 1100-1200) 24422 at 0900 in Bushey Heath; Croatian R, Zargreb 13.830 (Cr [Eng 0900-0905] to Eu) SIO444 at 0900 in Morden; UAER, Dubai 13.675 (Eng to Eu 1030-1100) SIO343 at 1030 in Edinburgh.

Those noted later came from Croatian R, Zargreb 13.640 (Cr [Eng 1302-1305] to Eu) was 43543 at 1302 in Stirling; R.Norway Int, Oslo 13.800 (Norw [Eng Sat] to Eu 1300-1330) SIO333 at 1315 in Scalloway; WYFR

Tropical Bands Chart

Freq MHz	Station	Country	UTC	D Xer	Freq MHz	Station	Country	UTC	D Xer	Freq MHz	Station	Country	UTC	D Xer
2.310	ABC Alice Springs	Australia	2007	F,G,H,I,J,N,O,P,U	4.785	Zhejiang PBS,	China	2240	F	5.040	Voz del Upano,	Ecuador	0256	C,J,M,T
2.325	ABC Tennant Creek	Australia	1857	F,G,H,I,J,N,O,P,U	4.785	H'gzhou	China	0314	M	5.045	R.Cultura do Para	Brazil	2145	C,F,G,M
2.340	Fujian 1, Fuzhou	China	2305	F,G,H,I,J,N	4.786	Ecos del Combeima	Colombia	1750	N	5.045	R.Difusora	Brazil	0145	C
2.390	Voz de Atitlan	Guatemala	0325	U	4.790	Azad Kashmir R.	Pakistan	1456	F,H,J,P	5.047	R.Togo, Lome	Togo	2050	C,E,F,J,K,M,N,O,P,T
2.415	Wenzhou PBS,	China	2300	F	4.790	R.Atlantida	Peru	2245	F	5.050	GFBC Nanning	China	1418	G,H
2.445	Jiangxi 1, Nanchang	China	2310	F,G	4.790	TWR Manzini	Swaziland	1820	C,H,J	5.050	Volce of the Strait	China	1640	F,J
2.475	Zhejiang 1, Hangzhou	China	2315	F,G,J	4.800	CPBS 2 Beijing	China	1300	C,F,G,J,P	5.050	Voz de Yopal, Yopal	Colombia	0116	C,M,P
2.485	ABC Katherine	Australia	1858	F,G,H,I,J,O,P	4.800	AIR Hyderabad	India	1512	F,G,H,J,P,T	5.050	Em Jesus Gran Poder	Ecuador	2355	G,N
2.560	Xinjiang BS, Urumqi	China	0028	M	4.800	LNBS Lesotho	Maseru	1822	C,F,H,J,M	5.050	R.Tanzania	Tanzania	1747	E,F,G,J,M,O
3.205	R.Ribelfrao	Brazil	0755	F	4.805	R.Nac. Amazonas	Brazil	2215	C,F,M,P,T	5.055	R.Difusora, Caceres	Brazil	0145	C
3.210	Em.Nacional, Maputo	Mozambique	1651	J	4.809	R.Libertad, Santa Fe	Bolivia	2312	T	5.055	RFO Cayenne	Fr. Guiana	0755	C,E,F,J,M
3.220	CPBS 1, Beijing	China	2053	F,G,H,O,R	4.810	R.San Martin Tara	Peru	0132	M	5.055	TWR Manzini	Swaziland	1701	H
3.220	R.Kara, Lome	Togo	1800	C,F,J	4.810	SABC Meyerton	S.Africa	1900	E,F,P	5.060	PBS Xinjiang, Urumqi	China	1452	C,F,G,H,J,K,M,N,P
3.223	AIR Simla	India	1403	C,F,H,J	4.815	R.Difusora, Londrina	Brazil	0025	C	5.065	R.Candip, Bunia	Zaire	2055	F
3.225	RRI Tanjung Pinang	Indonesia	2302	G	4.815	R.diff TV Burkina	Duagadougou	2125	E,F,L,O,P	5.075	Caracol Bogota	Colombia	0930	C,F,G,J,M,N,P,R,T
3.230	R.Sol de Los Andes	Peru	0120	C	4.820	La Voz Evangelica	Honduras	2312	C,E	5.083	R.Mundo, Cusco	Peru	0150	C
3.230	SABC Oranje	S.Africa	1800	C,F	4.820	AIR Calcutta	India	1420	C,F,H,J	5.097	R.Eco, Iquitos	Peru	0325	F
3.235	AIR Guwahati	India	1522	J	4.825	R.Cancao Nova	Brazil	2145	F,M	5.131	R.Vis.2000	Peru	2310	F
3.240	TWR Shona	Swaziland	1812	C,F,H,J	4.825	V of Selva	Peru	0900	G	5.240	Xizang, Lhasa	Tibet	1438	J
3.245	AIR Lucknow	India	1522	C,F,H,J,N,P	4.830	R.Botswana,	Botswana	2110	C,E,J,M,O,P	5.620	R.Iucan, Cutervo	Peru	2315	F
3.255	BBC via Maseru	Lesotho	2128	G,H,J,M,O	4.830	Gaborone	Botswana	2110	F					
3.260	Guizhou 1	China	1545	F,N	4.830	R.Bangkok	Thailand	1455	F					
3.270	SWABC 1, Namibia	SW.Africa	2028	C,F,H,J,O,P	4.830	R.Tachira	Venezuela	2150	C,F,G,P					
3.277	AIR Srinagar	India	1523	C,F,H,J,P	4.832	R.Reioj	Costa Rica	0820	F,G,J					
3.290	R.Centro, Ambato	Ecuador	0740	F	4.835	R.Tezulutlan, Coban	Guatemala	0217	P					
3.290	SWABC 2, Namibia	SW.Africa	2023	C,H,M	4.835	RTM Bamako	Mali	2109	E,F,J,K,M,N,O,P,R,T					
3.295	AIR Ranchi?	India	1503	F,H,J										
3.300	R.Cultural	Guatemala	0247	C,F,M,N	4.840	Hailongjiang, Harbin	China	2315	B,F,J					
3.305	R.Zimbabwe	Zimbabwe	1650	F,H	4.840	AIR Bombay	India	1725	C,F,H,J,N,O,P					
3.315	AIR Bhopal	India	1524	C,F,G,H,J,N,P	4.845	R.Fides, La Paz	Bolivia	0135	C					
3.316	SLBS Goderich	S. Leone	1825	J	4.845	RTM Kuala Lumpur	Malaysia	1435	F,H,J					
3.325	R.Tupi, Sao Paulo	Brazil	0750	F	4.845	ORTM Nouakchott	Mauritania	2105	C,E,F,G,J,M,O,P					
3.325	FRCN Lagos	Nigeria	1954	C,F,J,M,O,P	4.850	R.Yaounde	Cameroon	1918	C,M,N					
3.335	CBS Taipei	Taiwan	1954	F,H,J,N,O,P,R	4.850	Ulan Bator 1	Mongolia	1616	J					
3.345	RRI Ternate	Indonesia	2100	F	4.860	AIR Kingsway (Feeder)	India	1438	C,E,H,J,N,P					
3.355	AIR Kursaong	India	1527	F,H,J,P,R	4.865	PBS Lanzhou	China	1435	C,F,G,H,J,K,M,N,P,T					
3.356	R.Botswana	Gaborone	1954	C,F,J,O,P										
3.359	RTV Malagasy	M'gascary	1816	H,J	4.865	L.V. del Cinaruco	Colombia	2200	C,F					
3.365	R.Rebelde, La Julia	Cuba	1140	C	4.870	R.Cotonou	Benin	2107	C,F,M,O,P,T					
3.365	GBC R-2	Ghana	2045	C,E,F,G,J,M,N,O,P	4.879	R.Bangladesh	Bangladesh	1416	F,H,J,P					
3.365	AIR Delhi	India	1525	F,G,H,J,P	4.885	R.Clube do Para	Brazil	0316	C,F,M					
3.375	R.Nacional S.Gabriel	Brazil	0200	F	4.885	KBC East Sce Nairobi	Kenya	2110	C,F,M,O,P					
3.377	R.Nacional, Mulenvos	Angola	2220	H,O	4.890	R.Port Moresby	New Guinea	1940	F,G,J					
3.380	R.Malawi	Malawi	2115	H,N,O	4.890	ORTS Dakar	Senegal	0010	C					
3.385	RFO Cayenne	Guiana	1815	C	4.895	Voz del Rio Arauca	Colombia	0020	C,N					
3.395	RRI Tanjungkarang	Indonesia	1550	F	4.900	V. of the Strait 2	China	1439	F,G,H,J					
3.815	Taiwan 1 Sc, Beijing	China	2300	F	4.900	SLBC Colombo	Sri Lanka	1511	F,H,J,P					
3.900	Hulunbeier, Hailar	China	1520	F,J	4.905	R.Nat.'ndjamena	Chad	1845	C,E,F,J,K,L,M,N,P,T					
3.905	RRI Merauke	Indonesia	1516	J	4.905	CPBS 1, Beijing	China	2215	F					
3.915	BBC via Kranji	Singapore	1605	D,E,G,H,J,M,N,O,P,R,S,U	4.910	AIR Jaipur	India	1720	F,H,J,O,P					
3.925	NSB Tokyo	Japan	0745	B,F,G	4.910	RRI Bukittinggi	Indonesia	1446	J					
3.930	KBS Seoul	Korea	2240	F,G	4.910	R.Zambia, Lusaka	Zambia	2150	F,H,J,O,P					
3.934	RRI Semarang	Indonesia	1452	J	4.915	R.Anhanguera	Brazil	0810	C,F					
3.940	PBS Hubel Wuhan	China	2120	F,J	4.915	PBS Guangxi, Nanning	China	1424	C,H					
3.945	AIR Gorakhpur	India	1526	C,F,H,J,P	4.915	GBC-1, Accra	Ghana	2100	A,C,E,F,J,K,M,N,O,P,R					
3.945	Vatican Radio	Italy	2010	E,M										
3.950	Qinghai PBS, Xining	China	2254	C,F,G,J	4.915	KBC Cent Sce Niariobi	Kenya	1735	C,F,O					
3.955	BBC via Skelton	England	2014	C,E,G,M,V	4.920	AIR Madras	India	1723	F,H,J,N,O,P,T					
3.955	R.Budapest	Hungary	2200	U	4.925	R.S.Miguel,Riberata	Bolivia	2205	F					
3.955	Kazakh R, Novosibirsk	Kazakhstan	1515	N	4.925	R.Nacional, Bata	Eq.Guinea	2107	O,T					
3.955	Channel Africa	S.Africa	0355	U	4.927	RRI Jambi	Indonesia	1430	F,G,J					
3.960	Xinjiang PBS, Urumqi	China	1510	C,F,J	4.935	KBC Gen Sce Nairobi	Kenya	2049	C,F,G,O,P					
3.960	R.Budapest	Hungary	2125	N	4.940	AIR Guwahati	India	1402	H,J					
3.960	RRI Padang	Indonesia	1449	J	4.940	R.Abidjan	Ivory Coast	2320	C,N					
3.965	RFI Paris	France	0730	C,E,K,M,N	4.950	R.Nacional, Mulenvos	Angola	1928	H,J					
3.970	RFE Biblis	Germany	2015	C,M	4.950	V. of Pujiang	China	1335	F,H					
3.975	R.Korea via Skelton	England	2015	M,U	4.955	R.Marajoara, Belem	Brazil	0750	F					
3.975	R.Budapest	Hungary	2000	C,K,M,N,U	4.960	Mulenvos	Angola	2048	O					
3.980	VOA via Munich	Germany	1800	C,M,R,V	4.960	AIR Delhi	India	1445	J					
3.985	China R via SRI	Switzerland	2200	Q,V	4.966	R.San Miguel, Cusco	Peru	2245	F					
3.985	SRI Beromunster	Switzerland	2017	C,K,M,N	4.970	PBS Xinjiang	China	1452	F,G,H,J,M					
3.990	Xinjiang BS, Urumqi	China	1520	F,H,J	4.970	R.Rumbos, Caracas	Venezuela	0015	C					
3.995	OV via Julich	Germany	2017	C,E,M	4.975	Fujian 1, Fuzhou	China	2335	F					
4.003	RRI Padang	Indonesia	1600	C,F,J,P	4.975	R.Uganda, Kampala	Uganda	1940	C,F,H,J,M,N,O,P					
4.035	Xizang PBS, Lhasa	Tibet	1445	F,G,J	4.980	PBS Xinjiang, Urumqi	China	1450	F,H,J,P					
4.081	Ulan Bator 1	Mongolia	1455	F,G,P	4.980	Ecos del Torbes	Venezuela	2224	C,F,P					
4.190	CPBS Minority Sce	China	2205	F	4.985	R.Brazil Central	Brazil	2205	C,F,P					
4.271	R.Gonzanama, Loja	Ecuador	0340	F	4.990	Hunan 1, Changsha	China	1455	C,F					
4.330	Xinjiang BS, Urumqi	China	1414	F,G,H,P	4.990	FRCN Lagos	Nigeria	2020	C,F,M,N,O					
4.409	R.Eco, Reyes	Bolivia	2300	F	4.990	R.Ancash, Huaraz	Peru	0820	F					
4.460	CPBS 1, Beijing	China	1429	H	4.995	R.Andina, Huancayo	Peru	0254	M					
4.470	R.Movima	Bolivia	2230	F	5.005	R.Libertad, La Paz	Bolivia	0020	C					
4.500	Xinjiang BS, Urumqi	China	1527	E,F,G,H,J,M,N,O	5.005	R.Nacional, Bata	Eq.Guinea	1922	J					
4.600	R.Perla del Acre	Bolivia	2250	F	5.005	RTM Sibiu, Sarawak	Malaysia	2255	F					
4.650	R.Santa Ana	Bolivia	2240	F,G	5.005	R.Nepal, Kathmandu	Nepal	1510	F,H,J					
4.730	R.San Juan de Caraz	Peru	2558	F	5.009	R.Madagasikara	Madagascar	1810	J					
4.735	Xinjiang, Urumqi	China	1508	C,F,G,H,J,M,N,P	5.010	R.Garoua	Cameroon	1810	F,N					
4.750	Xizang BS, Lhasa	Tibet	1405	F,P	5.010	Guangxi 2, Nanning	China	2340	F					
4.753	RRI Ujung, Padang	Indonesia	1605	F,J	5.010	AIR Thiru'puram	India	0138	C,F,M,P					
4.755	R.Educ CP Grande	Brazil	0005	C,N	5.015	R.Brazil Tropical	Brazil	0835	F					
4.760	Yunnan PBS,	China	1417	F,G,H,J,T	5.020	PBS-Jiangxi Nanchang	China	2155	C,F,H,M,P					
4.760	AIR Port Blair	India	1427	C,H,J,P	5.020	La Vu du Sahel, Niamey	Niger	2111	E,F,H,J,O					
4.760	ELWA Monrovia	Liberia	2106	F,G,H,J,K,M,O,P,T	5.020	SLBC Tami Home Sce	Sri-Lanka	1639	H					
4.76														

Maritime Beacons

Freq kHz	C/S	Station Name	Location	DXer	Freq kHz	C/S	Station Name	Location	DXer
284.5	LZ	Lizard Lt	S.Cornwall	A,C,D*,E,F,H,N*,Q,R,S	301.5	KD	Kinnards Hd Lt	NE.Scotland	H*,J*,O*,R*
284.5	MA	Cabo Machichaco	N.Spain	E*,F*,G*,H*,J*,M*,N*,R	301.5	L	Torre de Hercules	N.Spain	C,E*,G*
285.0	PR	Porkkala	Finland	R*	301.5	OB	Hoburg	Sweden	E*,G*,H*,N*,O*,R*
285.0	NO	Cabo de la Nao Lt	S.Spain	E*	302.0	RB	Cherbourg Ft W Lt	France	A,B*,D*,E,F,G,H*,K,M*,N*,Q,R,S
285.0	NP	Nieuport W.Pier	Belgium	E*	303.0	D	Rota	SW.Spain	G*,N*
286.0	TR	Tuskar Rock Lt	S.Ireland	A,C,D*,E,F*,J,H,I*,J,N*,Q,R,S	303.0	FB	Flamborough Hd Lt	Yorkshire	A,B*,C,D*,E,F,H,J*,L*,M*,N*,Q,R,S
286.5	AL	Almagrundet Lt	Sweden	E*,G*,N*,R*	303.0	FV	Falsterborev Lt	Sweden	C,D*,E*,G*
286.5	BE	#Baily Lt	S.Ireland	A,E,H,J	303.0	YE	Ile d'Yeu Main Lt	France	A,D*,E*,F*,G*,H*,K,P,Q,R,S
286.5	BY	Cap Frehel Lt	France	F*	303.0	MY	Myggenaes Lt	Faeroes	O*,S*
286.5	FI	Cap Figuera	Majorca	E*,D*,G*,H*	303.5	BJ	Bjornund Lt	Norway	C,E*,G*,H*
286.5	FT	Cap Ferret Lt	W.France	O*,E,F,G,H,M*,N*,R,S*	303.5	FN	Feistein Lt	Norway	C,O*
286.5	NK	Inchkeith Lt	F.of Forth	C	303.5	IA	Llanes Lt	N.Spain	E*,G*,H*,M*,S*
287.3	BT	Bjartangar Lt	Iceland	E*	303.5	VL	Viljand Lt	Holland	E*,F,G*,J*,N*,Q,R,S
287.3	HA	Haifa Lt	Israel	G*	304.0	PS	Pt Lynas Lt	Anglesey	A*,B*,C,D*,E,H,J*,J*,M*,N*,P,Q,R
287.3	IB	I.Berlenga	Portugal	E*	304.0	SB	Sumburgh Hd Lt	Shetland Is	I*,O*
287.3	JA	Jaroslawiec	Poland	E*	304.5	MY	Cabo Mayer Lt	N.Spain	D*,E*,F*,G*,K,M*,P*,R
287.3	LE	Leba Rear	Poland	E*	305.0	FP	Fife Ness Lt	SE.Scotland	C,E,H*,J*,O*,Q
287.3	MD	Cabo Mondego	Spain	E*	305.0	GA	Malaga	S.Spain	R*
287.3	RO	Rozewie	Poland	E*	305.0	GL	Ile de Giraglia Lt	Corsica	E*
287.5	DD	Rosedo Lt	France	E*,N*	305.5	AL	Pt d'Ailly Lt	France	A,D*,E*,F*,G*,H*,J,K,M*,N*,Q,R,S
287.5	FR	Faerder Lt	Norway	C,E*,G*,H*	305.7	DA	Dalatangi Lt	Iceland	D*,G*,O*
287.5	SE	Sete Mt St Clair	S.France	E*,G*,P	306.0	EC	Elizabeth Castle	Jersey	A,P,R
288.0	HH	Hoek van Holland	Holland	E*,G*,P	306.0	FN	Walney Is Lt	DfJ Lancs	D*,E*,H,J,L*,M*,N*,Q
288.0	KL	Skinna Lt	Norway	C,E*,G*,O*	306.0	GN	Godhaven	Greenland	G*
288.0	OH	Old Hd of Kinsale	S.Ireland	A,H,J,O*	306.0	TN	Thyboron	Denmark	C*,G*
288.5	CT	Pt de Combrit Lt	France	D	306.5	GJ	Le Grand Jardin Lt	France	A,D,R
288.5	FI	Cabo Finisterre Lt	NW.Spain	E*,G*,H*,N*	306.5	KL	Kolkasrags	Estonia	E*
288.5	YM	Umuiden Front Lt	Holland	E,F,G*,N*,R*	306.5	KR	Kubussaar	Estonia	E*
289.0	BL	Butt of Lewis Lt	Is of Lewis	O*	306.5	MV	Morzhovskiy	Arctic	G*,R*
289.0	BY	Baily Lt	S.Ireland	A,B*,C,D,E,H,I*,J	306.5	OR	O.Osmussaar	Estonia	E*
289.5	KY	Oksøy Lt	Norway	E*,G*	306.5	RS	Ristna	Estonia	E*,H*
289.5	LD	Landsort S Lt	Sweden	E*,G*,H*,R*	306.5	SY	Sorve	Estonia	E*
289.5	MN	Hammerodde	Denmark	C,E*,O*	306.5	UT	Utsira	Norway	A*,B*,C,D*,E*,F*,G*,H,J,K,M*,N*,O*,P*,Q*,R*,S*
289.5	SN	Ile de Sein NW Lt	France	A,D*,E*,F*,G*,H*,R,S	307.0	GL	Eagle Is Lt	Ireland	C,D*,E,H,P
290.0	FD	Fidra Lt	F.of Forth	C,E*,D*	308.0	RC	Cabo Roca	Portugal	E*,G*
290.0	ST	Stevens Klint Lt	Denmark	S*	308.0	RZ	Roches Douvres Lt	France	A,D*,E*,F,G*,H,K,M*,N*,Q,R,S
290.5	DY	Duncansby Hd Lt	NE.Scotland	E,O*	308.5	NZ	St Nazaire	France	C,D*,E*,G*,R,S*
290.5	LL	Hallo Lt	Sweden	E*,G*,N*	309.0	MU	Kobenhaven	Denmark	E*,M*
290.5	SB	S.Bishop Lt	Pembroke	A,B*,C,D*,E,F,H,J*,M*,N*,Q,R,S	309.5	BA	Punta Estaca Bares	N.Spain	E*,P*,G*,H,N*,P*,R*
290.5	VI	Cabo Villano Lt	N.Spain	N*,P,Q*,R,S*	309.5	FH	Fruhollen Lt	Norway	E*,G*,R*
290.5	VY	Visby	Sweden	J*	309.5	MA	Marstein Lt	Norway	C,E*,G*,H*,J,N*,O*,Q*
291.0	SN	Cabo San Sebastian	S.Spain	G*	309.5	OD	Odeskiy	Ukraine	G*
291.0	OR	Orskar Lt	Sweden	E*,N*	309.5	PB	Portland Bill Lt	Dorset	A,D*,E*,M*,Q,R,S
291.5	CU	T.Navolokskiy	SSR Arctic	E*	310.0	ER	Pt de Ver Lt	N.France	A,D*,E*,F,G*,J*,K,Q,R,S
291.5	SK	South Rock LV	Co.Down	A,B*,C,D*,E,F*,H*,J,M*,N*,O*,P*,Q,R,S	310.0	GV	Goltur	Iceland	S*
291.9	LT	La Isleta	Canaries	D*,O*,P*,Q,R,S	310.3	GV	Goltur	Iceland	S*
291.9	NR	Montedor Lt	Portugal	D*,O*,P*,Q,R,S	310.5	BD	Bokfjord Lt	Norway	E*
291.9	MA	Punta Lantaila	Canaries	D*,O*,P*,Q,R,S	310.5	DA	Damietta Mouth	Egypt	B*
292.0	SJ	Souter Lt	Sunderland	E*	310.5	SG	Sjaellands N Lt	Denmark	C,E*,G*,N*
292.0	TD	Torungen Lt	France	A,B*,C,D,E,F,H,J,M*,Q,R,S*	311.0	GD	Girdle Ness Lt	NE.Scotland	C,E*,O*
292.5	SM	Pt St Mathieu Lt	France	A,D*,E,F,G,H,J,K,M*,N*,Q,R,S	311.0	NF	N.Foreland Lt	Norway	A,D*,F*,H,J,K,M*,N*,Q,R,S
293.0	CP	St Catherine's Lt	IOW	A,D*,E,F,J,M*,N*,Q,R,S	311.5	LP	Loop Hd Lt	S.Ireland	D*,E,H,I*,R*
293.0	RY	Rhinns of Islay Lt	Is of Islay	C,E,H,I*,O*,P	312.0	HO	Tennohmen Lt	Norway	E*
293.0	SN	Svinoy Lt	Norway	C,E*,G*,N*	312.0	OE	Dostende	Belgium	D*,E*,F*,G*,J,K,M*,N*,Q,R,S
293.5	RJ	Cabo Silleiro Lt	N.Spain	E*,G*	312.0	UH	Eckmuhl Lt	France	D*,E*,G*
294.0	KU	Kullen High Lt	Sweden	E*,G*	312.5	AK	Akmenrags	Latvia	E*
294.0	PH	Cap d'Alpdech	France	C,D*,E*,G*,H,J	312.5	BK	Baltiisk	Latvia	E*,G*,H*,296*
294.5	KA	Kaybolovo Lt	Estonia	D*,E*,F,G,K*,N*,Q,R,S	312.5	BT	Mys Taran Lt	Latvia	E*,G*
294.5	KC	#Old Hd of Kinsale	S.Ireland	E*	312.5	CS	Calais Main Lt	France	D*,F,G*,H,J,M*,N*,Q,R,S
294.5	NG	Mohini Lt	Estonia	E*	312.5	FV	Dstrov Belyy	SSR Arctic	G*
294.5	NH	Pikasaare Ots	Estonia	E*	312.5	KA	Klaipeda Rear Lt	Lithuania	E*,G*,J
294.5	PA	Pakrineem Lt	Estonia	E*	312.5	LB	Liepaja	Latvia	E*
294.5	PS	#Pt Lynas Lt	Anglesey	E*,J,H,I*,M*,R,S	312.5	VS	Cabo Estay Lt	N.Spain	H*,M*,N*,S
294.5	PT	#Souter Lt	Durham	C,J	312.5	VVV	Ventspils	Latvia	E*
294.5	SN	Sletnes Lt	Norway	E*,G*	312.6	SR	Skardhsfjara Lt	Iceland	E*,G*,J
294.5	UK	Sunk Lt V	Off Essex	D*,F,N*,Q,R,S	313.0	HA	Halten Lt	Norway	E*,G*,D*
295.0	SN	Sletnes Lt	Norway	N*	313.0	PA	Cabo de Palos Lt	S.Spain	O*,E*,G*,H*,M*,N*,Q*,S*
295.5	CB	La Corbiere Lt	Jersey	A,D*,E*,J,N*,Q,R,S	313.0	TY	Tory Is Lt	N.Ireland	C,E,H,D*
295.5	RE	La Rochelle	France	E*	313.5	BR	Cap Bear Lt	S.France	E*,G*
296.0	BH	Blavandshuk Lt	Denmark	A*,B*,C,D*,E*,F*,G,H,J,N*,Q*,R*,S*	313.5	CM	Cromer Lt	Norfolk	A,B*,C,D*,E,F,H,J,K*,M*,N*,Q,R,S
296.0	GR	Georee Lt	Holland	E*	313.5	OG	Dlands Sodra Grund	Sweden	E*,H*
296.0	KN	Skrova Lt	Norway	D*,G*	313.5	PQ	Porquerolles	S.France	E*,G*
297.0	FG	Pt de Barfleur Lt	France	A,D*,E*,F*,G,H,J,K,M*,N*,Q,R,S	313.5	WB	Weser Pilot V.	Germany	G*
297.5	MA	Mantyluoto	Finland	E*,G*	314.0	HK	Hekkingen Lt	Norway	E*,G*,N*
297.5	PS	Cabo Penas Lt	N.Spain	E*,G*	314.0	VG	Ile Vierge Lt	France	A,B*,C,D*,E,F,G*,H,I*,J,M*,N*,O*,Q,R,S
298.0	GX	Ile de Groix	France	D*,E*,F,G,K,R,S	314.5	SK	Strandhofn	Iceland	E*,G*
298.0	TA	Cabo Gata	S.Spain	E*,S	314.5	TL	Punta D.Penna	Italy	H*,N*
298.5	RR	Round Is Lt	Is Scilly	A,B*,C,D*,E,F,H,I*,J,K,M*,N*,Q,R,S	316.0	IN	Ingolfshofdhi Lt	Iceland	D*,E*,G*,H*
298.5	SW	Skagen	Denmark	C,E*,G*	319.0	LEC	Stavanger	Norway	A,C,D*,E,F,H,I*,J,L*,M*,N*,O*,P,Q,R,S
298.8	DV	Djupivogur	Iceland	E*,G*,D*,S*	367.0	JV	Jakobshavn	Greenland	O*,P,Q,R,S
298.8	HO	Hornbjarg	Iceland	E*,G*	372.0	OZN	Prins Chris's Sund	Greenland	D*,E*,F*,G*,J*,D*
299.0	AD	Ameland Lt	Holland	C,D,E,F,G,J,M*,R	381.0	AB	Akraberg	Faeroe Is	A*,C*,D*,E*,F*,G*,H*,I*,J*,M*,N*,O*,S*
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299.5	SK	Skotsvaer Lt, Rost	Norway	E*,G*,S*					
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300.5	LA	Lista	Norway	C,E*,G*,H*,J*,N*,O*,S					
301.0	CA	Pt de Creach	France	D*,E,G					
301.0	ER	Eierland Lt	Holland	C,E*,G*,N*					
301.1	RG	Raufarhoefn	Iceland	E*,G*,M*,Q					

Many of the maritime radiobeacons along the coastline of the UK and some other countries were logged by listeners during October, November and December. The propagation conditions at night varied quite a lot - sometimes they were well above average and the sky waves from some remarkably distant beacons then reached the UK.

Particularly good conditions were noted on October 21 by **Albert Moore** (Douglas, IoM). Between midnight and 0100UTC he heard the beacon at Punta D Penna, Italy (TL) on 314.5 and two in the Canaries - La Isleta (LT) 291.9 and Punta Lantaila (NA) 291.9.

The beacon at the Haifa Lt, Israel (HA) on 287.3 was heard at 2010 by **Jim Edwards** in Bryn. His extensive log included the Greenland beacons at Godhaven (GN) on 306.0 and Christian's Sund (OZN) on 372.0. The latter was also logged at night by **Steve Cann** (Southampton), **Robert Connolly** (Kilkeel), **John Eaton** (Woking), **Robert Moore** (Holywell) and **Peter Rycraft** while in Scrabster. Sometimes **John Macdonald** (Thurso) received OZN quite strongly, which he says is hardly surprising because it is located at the very tip of Greenland and is unusually powerful (2kW). Occasionally he has heard the beacons along the West Coast at Kulusuk (KK) on 283.0, Godshavn (GN) and Scoresbysund (SC) on 343.0.

The Faeroes beacons at Akraberg (AB) on 381.0 and Noslo (NL) on 404.0 were received after dark by quite a few listeners. **Peter Pollard** (Rugby) heard them for the first time on December 12, but they were very clear on the 27th. Down in Bridgwater, **Darren Beasley** also logged them for the first time.

Checks during the day by **Kenneth Buck** (Edinburgh) revealed that some of the 'regulars' were inaudible - he suspects they were faulty and had not been repaired promptly. **John Stevens** (Largs) has been unable to receive the Butt of Lewis beacon (BL) on 289.0, but a local Coastguard has assured him that it is still active. **John Macdonald** has been hearing it in Thurso, but the signal seems weaker than hitherto.

The Royal Danish Administration of Navigation and Hydrography have informed **Peter Rycraft** (Wyckham Market) that the Sletterhage beacon (SL) was closed down in 1992. There is an aero beacon (SL) on 315.0.

Robert Connolly has produced an updated version of his Radiobeacon Guide, that lists even more beacons! For further details, write to him via me, enclosing an s.a.e.

DXers:

- A: Darren Beasley, Bridgwater.
- B: Leslie Bliss, Knarborough.
- C: Kenneth Buck, Edinburgh.
- D: Steve Cann, Southampton.
- E: Robert Connolly, Kilkeel.
- F: John Eaton, Woking.
- G: Jim Edwards, Bryn.
- H: Albert Moore, Douglas, IoM.
- I: Robert Moore, Holywell.
- J: John D'Halloran, Harrogate.
- K: Fred Pallant, Storrington.
- L: Clare Pinder, Appleby.
- M: Peter Pollard, Rugby.
- N: Peter Rycraft, Wyckham Market.
- D: Peter Rycraft, Thurso.
- P: Tom Smyth, Co.Fermanagh.
- Q: Philip Townsend, E.London.
- R: John Wells, E.Grinstead.
- S: Peter Westwood, Farnham.

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

CALLSIGN 95

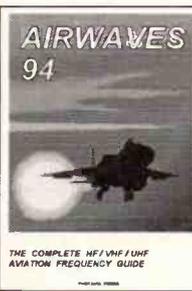
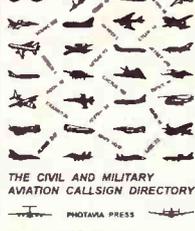
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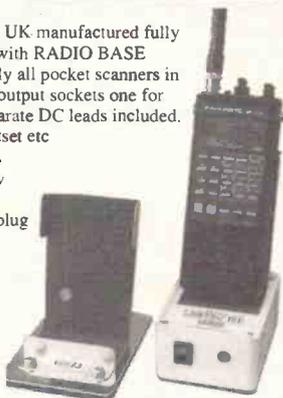
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Intended for the aircraft and radio enthusiast to use as a stand alone reference, or as a partner to *Airwaves 94*. Over 5300 military and 3000 civil callsigns are covered in detail. 108 pages. £7.95



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The Complete HF/VHF/UHF Aviation Frequency Directory
Much of the more obscure (especially military) information is made accessible in this volume. Not only are facilities/activities listed, giving their frequencies, but also there are reverse lists - when the frequency is known, the allocated user can be found. Airways sectors are listed so much more clearly than in the *Supplements*. The main transponder code groups are included. In fact, the book covers all the way from h.f. up to u.h.f. 88 pages. £7.95

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David J. Smith
Air band radio listening enables you to listen-in on the conversations between aircraft and those on the ground who control them, and is an increasingly popular and fascinating hobby. A new chapter on military air band has been added. The author, an air traffic controller, explains more about this listening hobby. 190 pages. £8.99

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FLIGHT ROUTINGS 1994
Compiled by T.T. & S.J. Williams
This guide was produced with the sole aim of assisting airband listeners to quickly find details of a flight, once they have identified an aircraft's callsign. It identifies the flights of airlines, schedule, charter, cargo and mail, to and from the UK and Eire and overflights between Europe and America. 122 pages. 0/P

GUIDE TO FAX RADIO STATIONS 14th Edition
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This book covers the complete short wave range from 3 to 30MHz together with the adjacent frequency bands from 0 to 150kHz and from 1.6 to 3MHz. It includes details on all types of utility stations including FAX and RTTY. There are 19549 entries in the frequency list and 3590 in the alphabetical callsign list plus press services and meteorological stations. Included are RTTY & FAX press and meteo schedules. There are 11800 changes since the 10th edition. 534 pages. £30.00

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Peter Shore
As in 'Broadcast Round-up', his column in *PW*, Peter Shore has laid this book out in world areas, providing the listener with a reference work designed to guide around the ever-more complex radio bands. There are sections covering English language transmissions, programmes for DXers and s.w.l.s. Along with sections on European medium wave and UK f.m. stations. 266 pages. £5.95

INTERNATIONAL VHF FM GUIDE 7th Edition.
Julian Baldwin G3UHK & Kris Partridge G8AUU
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RADIO LISTENERS GUIDE 1995
Clive Woodyear
This is the third edition of this radio listener's guide. Simple-to-use maps and

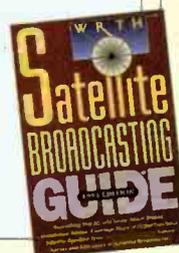
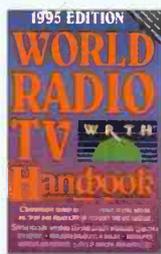
charts show the frequencies for radio stations in the UK. Organised so that the various station types are listed separately, the maps are useful for the travelling listener. Articles included in the guide discuss v.h.f. aerials, RDS, the Radio Authority and developments from Blaupunkt. 68 pages. £3.45

SHORT WAVE INTERNATIONAL FREQUENCY GUIDE
This book contains a comprehensive frequency listing covering 400kHz - 30MHz and is packed with everything from the basics of short wave listening to explaining FAX and RTTY. In this updated version there are many new broadcast and utility stations listed. 188 pages. £12.95

UK SCANNING DIRECTORY 4th Edition
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VHF/UHF SCANNING FREQUENCY GUIDE
This book gives details of frequencies from 26MHz to 12GHz with no gaps and who uses what. Completely revised and enlarged (February 1993), there are chapters on equipment requirements as well as antennas, the aeronautical bands, and the legal aspects of listening using a scanner. 156 pages. 0/P

WORLD RADIO TV HANDBOOK 1995
Country-by-country listing of i.w., m.w. & s.w. broadcast and TV stations. Receiver test reports, English language broadcasts. The s.w.l.'s 'bible'. 15.95



SATELLITES

NEWNES GUIDE TO SATELLITE TV
Derek Stephenson
This book, the 3rd edition, is a hard bound volume, printed on high quality paper. The author is a satellite repair and installation engineer and the book covers all information needed by the installation engineer, the hobbyist and the service engineer to understand the theoretical and practical aspects of satellite reception with dish installation and how to trouble-shoot when picture quality is not up to anticipated reception. Mathematics has been kept to a minimum. 371 pages. £18.95

SATELLITE BOOK - A Complete Guide to Satellite TV Theory and Practice
John Breeds
This book deals almost exclusively with television broadcast satellites and is a comprehensive collection of chapters on topics, each written by an expert in that field. It appears to be aimed at the professional satellite system installer, for whom it is invaluable, but it will be appreciated by a much wider audience - anyone interested in satellite technology. 260 pages. £32.00

SATELLITE EXPERIMENTER'S HANDBOOK 2nd Edition
Martin Davidoff K2UBC
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SATELLITE TELEVISION
A layman's guide
Peter Pearson
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Dr Ralph E. Taggart WB8DQT
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ALL ABOUT VHF AMATEUR RADIO W. I. Orr W6SAI

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AMATEUR RADIO FOR BEGINNERS RSGB Victor Brand G3JNB

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AMATEUR RADIO LOGBOOK Published by RSGB

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AMATEUR RADIO TECHNIQUES RSGB Pat Hawker G3VA

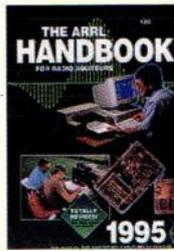
Anyone who enjoys Pat Hawker's 'Technical Topics' in *Radio Communications* will enjoy this book. An amateur radio manual itself, this paperback book, the 7th edition, can only be bettered by a new edition. A truly excellent reference source with a practical bias. 368 pages. £9.50

ANTENNAS AND TECHNIQUES FOR LDW-BAND DXING (ARRL) John Devoldere ON4UN

This unusual book will be of particular interest to 1.8, 3.5 and 7MHz operators as it's packed with information on antennas and operating tips for 'Top Band to Forty' fans. There are chapters on low band propagation, operating techniques, equipment and for the computer minded there's a chapter on newly-available low band software. 393 pages. £14.50

ARRL HANDBOOK FOR RADIO AMATEURS 1995

This is the 72nd edition of this handbook and contains the best information from previous issues. New for this edition is some information on feedback-loop design for power supplies, a new gel-cell charger project, updates on antenna systems and new coverage of baluns, propagation programs are compared and colour SSTV and telephone FAX machines are also covered. Finally there's a new section on 'for the workbench' with new projects for the reader to build. 1214 pages. £19.95



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Clive Smith G4FZH and George Benbow G3HB
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INTRODUCTION TO AMATEUR COMMUNICATIONS SATELLITES

BP230. A. Pickard
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Volumes 1, 2 and 3 Edited by M. W. Dixon G3PFR
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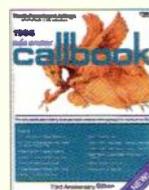
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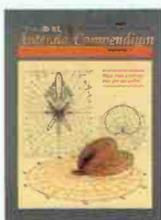
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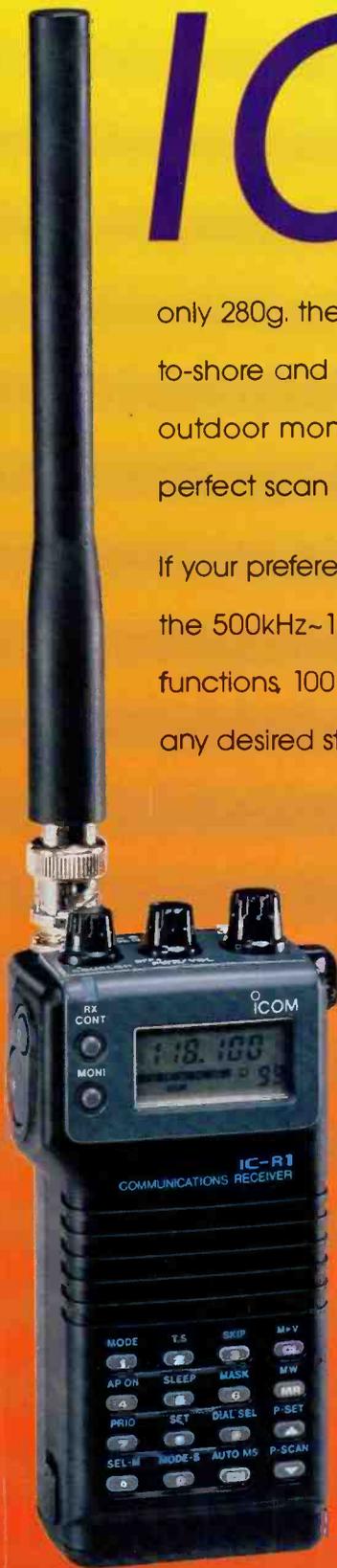
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We think you will agree that the two ICOM receivers described here are certainly desirable, so see them at your local dealer today.



IC-R100

ICOM also manufacture a full range of base-stations, mobiles and handheld transceivers to cover all popular Ham frequencies... and beyond.

No matter what your requirements, ICOM have the radio for you.

For details of your local authorised Icom dealer contact:

Icom (UK) Ltd. Sea Street Herne Bay Kent CT6 8LD.

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The ICOM logo, consisting of a stylized red 'O' above the word 'ICOM' in white capital letters on a dark blue background.

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