

short wave magazine

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REVIEWED

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World Radio History

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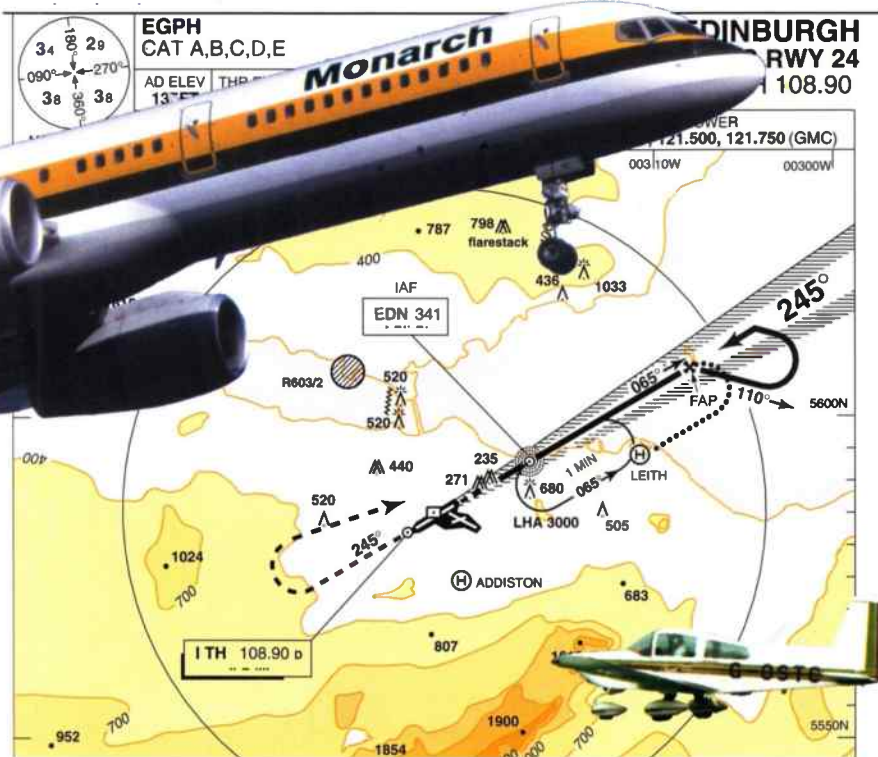
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contents

Vol. 58 Issue 04 April 2000
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ON SALE MARCH 23
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AIRBAND SPECIAL by Godfrey Manning



Cover picture courtesy of Ian Doyle

features

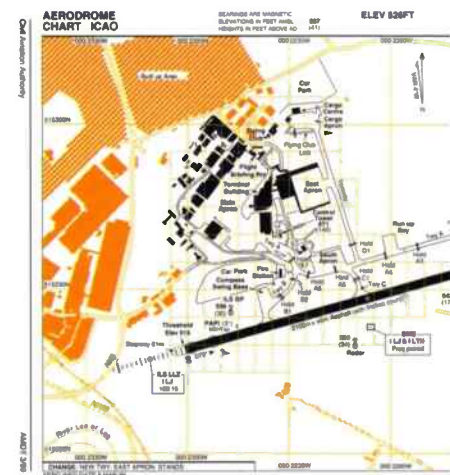
BROADCAST

- 12 Bandscan Europe
- 13 LM&S
- 18 World Wide Radio Guide
- 23 Off The Record

38 LET'S FLY

Ever wondered what it would be like to operate a flight? What's it like from the pilot's point of view? Now you can find out. Godfrey Manning G4GLM explains all.

44 AIRBAND - THE COLUMN



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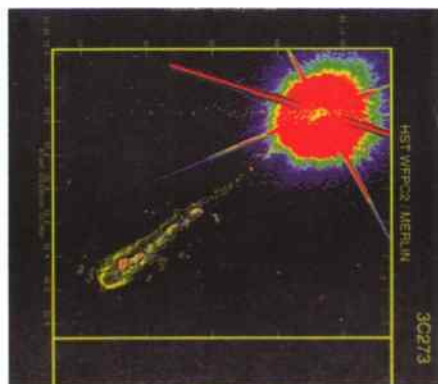
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NEXT MONTH IN MAY SWM

- Propagation Special with Jacques d'Avignon.
- JW examines exactly what makes a good receiver.
- CommTel COM225 base scanner reviewed.



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26 HOW TO RUIN ANOTHER PERFECTLY GOOD RECEIVER

Bob Ellis reminisces as only Bob can.

29 COMMERCIALLY SPEAKING

John's back with another 'classic' commercial receiver to make you drool. This month JW has the Harris RF-590A under the microscope.

46 SCANCAT GOLD FOR WINDOWS SE - PLATINUM EDITION VERSION 7.5

When we gave Faris Raouf the chance of reviewing the latest and greatest version of *Scancat*, he jumped at the chance. So, what did he make of the Platinum Edition version 7.5? Turn to page 46 and find out.

52 THE SCIENCE OF JODRELL BANK

We've read about the history and technology. This month, in the final part, Dr. Alastair G. Gunn uncovers the scientific aspects of Jodrell Bank.

regular columns



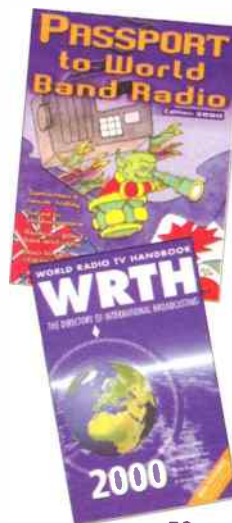
68



56



71



59

Airband	44
Amateur Bands	80
Attention 123!	82
Bandscan Europe	12
Book Store	59
Communiqué	6
Decode	78
DXTV	69
Editorial	4
Info In Orbit	71
LM&S	13
MilAir	65
Off The Record	23

Order Form	84
Propagation Extra	67
Propagation Forecast	66
QSL	5
Rallies	7
Satellite TV News	56
Scanning	75
SSB Utilities	68
Subscription Offer	32
Trading Post	83
What's In PW	9

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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, **KANGA PRODUCTS, Sandford Works, Cobden Street, Long Eaton, Nottingham NG10 1BL**. Tel: 0115 - 967 0918. Fax: 0870 - 056 8608.

Photocopies & 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 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 for SWM are £2.99 each and photocopies are £2 per article.

Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate.

A complete review listing for SWM/PW is also available from the Editorial Offices for £1 inc P&P.

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We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. Any technical queries by E-mail are very unlikely to receive immediate attention either. So, if you require help with problems relating to topics covered by SWM, then please write to the Editorial Offices, we will do our best to help and reply by mail.

ed's comments

What No SWM?

We appear to have had some problems with the availability of the March issue of SWM in Glasgow. I've had several reports from disappointed readers in and around this area. We've been able to organise a copy of SWM for those that have reported the problem, but did you too experience a problem with last month's issue? Please let me know if so. I need to know which retailer failed to come up with the goods, and their location. Please let me know, it is important that we discover any 'SWM black spots' so that we can take appropriate action. In the meantime don't forget that we can supply, post free, SWM direct to your door, or perhaps a subscription would suit you better?

Top Ten

It has been suggested by **Tony Barrett** of Newton Abbot that we should compile a Top 10 chart of receivers, antennas and accessories. Well, I'm all for this. It should prove very interesting indeed. So without further ado I will declare the SWM Reader Equipment Survey open! Please drop me a line at **SWM Reader Equipment Survey, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW**, or you can E-mail your submission to swm-survey@pwpublishing.ltd.uk So that we can publish the results in a timely manner, please get your details to me by 27th April. We'll compile a chart and feature the results in the June issue of SWM.

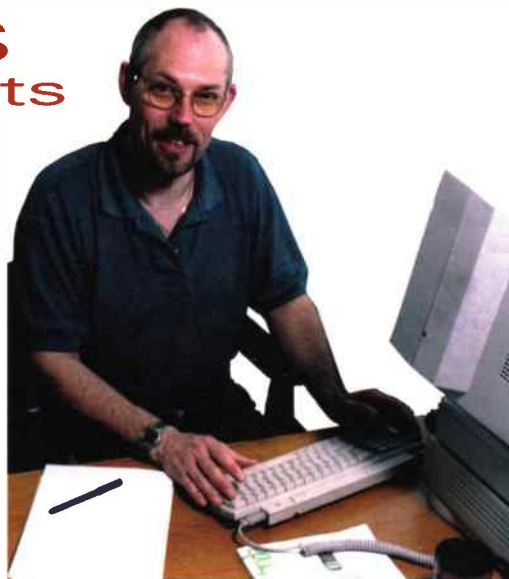
PMR446

Ever since I bought some PMR446 transceivers for the family, so that we can communicate on long walks, cycle rides and other outings, mind you I use mine mostly as a bike to bike intercom when out on the K1100, I've noticed a complete lack of activity in my local area. Before you all shout, I know the power levels are such that the range is limited to a few kilometres, but I'd have expected to hear someone else, I do leave it scanning most of the time. Just recently, I happened to attend an AWDC off-road motor sport event, and wow what a difference, activity on all channels. Organisers and competitors and spectators all using free communications to the full. I'd be interested to hear from any PMR446 users of their experiences.

Obit

I have just received news of the passing of an SWM contributor of yesteryear. Bob Short G3GNR/N7PUA, sent me the following about Bill Brennan G3CQE who passed away age 72 on Sunday 5 March.

"W.M. (Bill) Brennan G3CQE, passed away last Sunday at the age of 72 in a Bristol Hospital. First



licensed just after WWII, Bill wrote the first RTTY column in *Short Wave Magazine* for a number of years.

After leaving the RAF as a WOP/AG he joined the BBC in their transmission division and spent the rest of his working life there.

Bill finally retired as Senior Maintenance Engineer in charge of a shift at Rampisham high power short wave transmitter.

Bill and his wife Daphne became good friends of both my wife (G7FHW) and I, over 40

years ago we subsequently became colleagues at the BBC, although in different departments.

During this time Bill encouraged my interest in RTTY having our first QSO on 2 October 1960! All RTTY machines in those days were noisy and oily! Much later, of course, computers made for less messy and quieter means of experiencing RTTY and other data modes.

In the 1960s Bill lived in the Norwich area and a lot of the original RTTY work was done there, mostly due to the Post Office (as it was at the time), releasing some old 3X tape machines. I was lucky in having 7B sheet feed machine which was considered a luxury.

Bill's work finally moved him to Crewkerne in Somerset and Rampisham, where he was very active with amateur radio and the local repeater groups.

Bill was, I would say, often at the fore in developing ideas for new techniques. He will be sorely missed both by the amateur radio community and his friends and family."

DXTV

John Murphy from Galway has written to me regarding last month's Radio and DXTV News item on page 11. Apparently we are in error by saying that there is a gradual and progressive close down of Band 3 TV channels in favour of u.h.f.

John explains that only the low power transmitters are being converted to u.h.f., with the main transmitters continuing to operate on v.h.f. Band 3 for the next fifteen or so years. John also informs me that the main stations are actually undergoing a programme of replacement of their Band 3 transmitters.

Apparently the v.h.f. Band 1 (Ch. B) outlet at Maghera in county Clare is currently on low power and will shortly close. The main transmitters will only convert to u.h.f. for Digital broadcasting. The new commercial station, TV3, and the Irish language station TG4, are available from all sites on u.h.f.

Thanks for the update John.

So, that's it from me for this month, enjoy the magazine.

From all of us here, vy 73

Kevin

Dear Sir

After reading the article by Peter Bond in February's issue (MilAir Methodology), I have become more interested in listening and watching the military aircraft. I have been an aircraft fanatic (a frustrated one at that) since I was very young. I have always had an aircraft radio of some kind and now I have an MVT-7100, which I have had for a couple of years now and wouldn't part with.

I was interested to find out about the magazines *Scramble* and *Military Aviation Review*, but unfortunately I can't seem to get them anywhere (help!).

Also, I wonder if you could help me sort out what would improve my reception on side bands. I can pick up lots of noise and foreign music, but nothing interesting. Is there a special sort of antenna that would improve my reception? I had bought an antenna similar to a 'super stik', but smaller, which sits on the chimney. For aircraft (with me being beside Newcastle Airport), I can sometimes reach 80km and I can pick up the military on the ranges, which is not bad.

I hope you can help me in any way possible to help me enjoy my hobby a lot more.

John Ellis

Newcastle upon Tyne

John, both publications are subscription only. Contact details are as follows: Scramble is a Dutch publication and is about 80% in Dutch language. The current annual subscription is £33. The magazine may be contacted at Post Bus 75545, NL-1118 ZN, Schiphol, Holland. Their web site is www.scramble.nl I understand that subscriptions can be obtained from The Aviation Hobby Centre, see page 81 in this issue for details.

Military Aviation Review also has a website - www.mar.co.uk - postal address is Military Aviation Review, West Field Lodge, Aslackby, Sleaford, Lincolnshire NG34 0HG, a years subscription costs £22.

The MVT-7100 is usually a good performer on h.f. s.s.b., I've had reports of users hearing exotic DX on the whip antenna alone. Perhaps you need to perfect your operating technique by practising on the amateur bands. Good luck. - Ed.

Dear Sir

I write to congratulate you and Paul Beam on the new 'World Wide Radio Guide', which started in the February 2000 *SWM*. A great idea - and not before time.

I did find a few omissions, such as Australia and New Zealand, which are quite audible at the moment. Still, given time, I think this section can develop into a first class reference source. We, the readers, should contribute to this too - the more information the better!

While writing, I must comment on the February 2000 *SWM* - what a good read! A good selection of items for everyone, my own area of listening is mostly broadcast and aero/military/maritime, so the 'MilAir Special' was right up my street.

My main receivers are a Yupiteru MVT-5000 for scanning and a Realistic DX-394 for h.f. The latter was a real bargain at £99 from Nevada. I notice that the price has started to creep up again now to £150 or so. This little set really is a very capable receiver. I have had very few problems with mine, and the timer and memory features, although not extensive, do provide some useful ways of using the set. Put through a decent size speaker and a Howes audio filter, the sound output is good.

One final thought - how about a 'Readers' Top 10 Radio Survey' to find out what we are all using and maybe what sort of antenna we are connecting our radios to?

Keep up the standard of a great magazine...cheers for now!

Tony Barrett

Newton Abbot

Dear Sir

I have been reading my newly arrived copy of *Short Wave Magazine*, March 2000. In the letters section I noticed a comment with reference to a frequency listing I sent in a short time ago. Mr Roy Smart is uncertain as to how much he should be receiving on these frequencies. They were the Kinloss standby and alternative frequencies. The answer, as pointed out, is not very much at all, because they are only used when the main frequency of 5.680MHz is unavailable because of noise or fading.

I use an AOR AR8000 hand-held receiver with just a long telescopic antenna. The main improvement is to use a good clean earth as well, this greatly improves reception of faint signals. It will also pick up more noise, because most earths are also good at picking up all the rubbish going. I use a choke to reduce the noise as much as possible. The power supply that came with the AR8000 was not regulated, so I fitted all the missing parts, the circuit board has places for a three terminal regulator, etc.

The earth pin is metal, but not connected to anything, so I have connected it via a choke to the 0V line. Also I use a mains filter plus VDR (Voltage Dependent Resistor) to further protect and cut down the noise. The earth is filtered by its own large choke, 150mH wound on two bobbins with

Short Wave Magazine, April 2000

powdered iron Pot cores.

The exact value of inductance is not critical, but the more the better is the way of things. Keep the live and neutral wires as short as you can and away from the inductor, to prevent pick up of unwanted hash from the incoming mains voltage source. All including the mains sockets are housed in a metal box for screening.

I am working on an even better filter and noise reduction unit at this time. When it is finished and proven I will submit an article so all can be better off. I hope this will explain my situation and enable others to improve their lot. Why sell a power supply that is able to be fully regulated without fitting the parts is beyond me. Cost I suppose, but then the radio was £369, so what of another £5 for a decent supply.

I do most of my listening in the wee small hours of the night. Unless a request for frequencies is published, the call for London Mill. frequencies, then I put down whatever I am doing at the time and tune about. The best times are from about 0830 to 1700. I found several interesting incidents going on in the early afternoon. Good weather is a must, our chaps do not like bad rain or high winds. As for the rescue frequencies, they are most likely to be active in these very adverse conditions.

Watch the news - I have found that more rescues involve v.h.f./u.h.f. frequencies now so distance from the coast is very important. Stay on 5.680 is all I can say if there is any really big rescue, this is where the most will happen. But, yes the but, it is still very hit and miss.

Ian Johnson
West Midlands

Ian, I contacted AOR UK, they tell me that the mains adapter that they supply is not meant to be a p.s.u. merely a charger. It just happens that the unit has enough output to act as a p.s.u. Other suppliers I believe add their own chargers, some of which will not enable the radio to run. You are correct in saying that a regulated p.s.u. is the best solution. There are many suitable units available cheaply if you look, and if like yourself other owners are able, then home construction is a cheaper option. - Ed.

Dear Sir

I own an AOR AR3000 receiver which developed a display fault, and also required a back up battery replacement. I telephoned AOR UK in Derbyshire, enquiring about a repair. I was quoted a reasonable price for both repairs.

I then enquired about work turn-around. I was told that currently they had a week's worth of work ahead of them and that I should keep hold of the receiver for a few days. Because I had some time off work I suggested bringing it along personally as I could then have a day out in Derbyshire (and visit Lowe Electronics as well).

Needless to say, AOR UK not only fixed the problem, the same day! But the gentleman I spoke to also advised me about some pager interference I had been suffering, and tested the image performance of the receiver, and charged me less than I was quoted!

In future I will have no hesitation in purchasing from AOR UK, even though I know I may get a cheaper price from 'Grey Market' rigs, I doubt if the support would be anywhere near as good.

Thank you again AOR!

Adrian Rees
Chester

Dear Sir

I have been having your magazine since 1991 and I look forward to every edition. Now I am asking through you if it would be possible for any of your readers to help me get my NRD-545 to connect to my computer. I have loaded the supplied software, connected RS-232 cable, have got picture of receiver on screen, but then I have come to a full stop. I am completely out of my depth and totally baffled.

Keith Mayhew
Notts

Keith, I'm not familiar with the NRD-545 under computer control myself, but I'm sure we have some readers who are, can anyone help? Replies via the Editorial Offices please. - Ed.

Dear Sir

This is the first time that I have contacted you, even though I have been a subscriber to *SWM* and *PW* for many years. This morning, having a days holiday from work, I was awakened by the sound of the postman delivering your magazine, something that of course I always look forward to finding usually when I return home from work, I was delighted to find that it was the 'ShackWare Special' edition.

I would not have thought that some years ago I would have been saying this, I did not join in the comments of some of the outraged people complaining in your letters page, "If I want to read about computers, I will buy a computer magazine", but I must admit I was very sceptical about the inclusion of the 'ShackWare' column.

About three years ago I bought my first computer, mainly to try my hand at decoding some of the strange warbling signals coming from my h.f. set, since then, I can honestly say that computers have helped me more to enjoy my radio hobby than I could ever have known, not just from decoding, but in every way.

Just contacting your magazine by this E-mail and finding the many Internet sites related to short wave and amateur radio, has brought me closer to our wonderful hobby than ever before.

So my thanks to you all at *SWM* for the inclusion of Jerry Glenwright's 'ShackWare' column, and for a great magazine.

Best wishes.
Jack Nelson GODNC
Cheshire

As was said at the time of the 'Great Computer Revolt', 'ShackWare' is a column about radio enhanced by computers, it's not a computer column. I'm very glad you and many of your fellow readers enjoy Jerry's offerings. - Ed.

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 at QSL, *Short Wave Magazine*, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. THE BEST LETTER WILL RECEIVE A £20 VOUCHER TO SPEND ON ANY *SWM* SERVICE.

New Blessings

John Bartlett, a former Chief Superintendent for Greater Manchester Police, is the new Chief Executive of **Feba Radio**. As his first overseas mission for the charity, John attended the launch of Baraka FM - Feba's new station in Africa.

Baraka, the Swahili word for 'blessing', had its launch on Friday 4th February. This exciting event started with a hill top service led by the Right Rev. Bishop Benjamin Nzimbi. It then moved through the town of Mombasa to the new studio, where John officially cut the ribbon.

The celebration party took place in true local style, with drinks sipped out of coconut shells and a sumptuous meal of roasted goat. Musicians entertained lively audiences in a colourful display of local talent.

Mombasa is Africa's second largest city, with a population of nearly a million people of mixed ethnic origin. The station intends to broadcast in Swahili for eight hours a day, and in English for sixteen hours a day.

John believes the station "is a golden opportunity to develop programming that will touch unreached people with the message of Christianity. It was a privilege to be there at the beginning of this important adventure". John is not one to stand still for long, as he's off to Cyprus soon for the start of the charity's international council meetings.



John Bartlett cuts the ribbon to launch Baraka FM.

Talk & Rally

Members of the **Bangor and District Amateur Radio Society** meet on the 1st Wednesday of every month in the Clandeboye Lodge Hotel, Bangor, at 2000. On **Wednesday 5th April 2000** they are hosting a talk on 'Backpacking'. The Society will also be holding their annual constructor's contest with prizes for the best projects. A working home-brew h.f. station will be in operation. Visitors and new members are (as always) most welcome.

On **Sunday 25th June 2000**, the Society are holding their Summer Radio & Computer Rally. There will be a good selection of traders and an excellent Bring & Buy will be in operation, with the addition of a new computer section. The rally will also be held at the Clandeboye Lodge Hotel, Bangor, with doors opening at 12 noon. Admission is £2.

More information from **Mike G14XSF** on **028-42772383**, or visit the club website at <http://welcome.to/bdars>

GM Activity Weekend

The **GM DX Group** - Scotland's DX Association - would like to remind amateurs world-wide that the GM Activity Weekend 2000 takes place on 15/16 April. It is hoped that a large number of GMs will take part, with some also activating Islands.

Activity should take place on all bands using as many modes as possible. At a recent committee meeting, donations to several forthcoming DXpeditions were also agreed - Clipperton -

Hoddesdon Club

Members of the **Hoddesdon Radio Club** meet at Rye Road, Hoddesdon, Herts, from 2000. On April 11th there will be a talk by Don on 'Valves Revisited', and on the 25th, there is an open forum. All short wave listeners are welcome, and if you would like further information, contact Don on **0181-292 3678**.

ON4WW £150; Tromelin - **F5NOD** £150 and Agalega - **G3KHZ** £100. The Group's donation's policy is similar in criteria to that used by The Chiltern DX Club.

The GM DX Convention and Annual Dinner will take place at The King Robert Hotel, Bannockburn, on 16th September 2000 and preparations are well underway. Over 70 amateurs attended last year's Dinner including **VK9NS**, **E16FR** and **G3SXW** who were the main speakers.

The GM DX Group also sponsor the very successful Islands of Scotland Award and to date over 400 award booklets have been sold world-wide. Anybody interested in applying for an award or taking part in the scheme should contact **GM4UZY**, **QTHR**. Information on The GM DX Group as a whole can be obtained from the Secretary, **Tom Wylie GM4FDM**, **QTHR** or E-mail: twylie@net.ntl.com

CRI Comes To London

WRN



Do you want to find out more about the Chinese culture in this New Year of the Dragon? Do you need to know the news that affects the Tiger economies on a day-to-day basis? Do you want to expand your horizons beyond the Western world-view? Now you can. The pulse of China will be felt across the airwaves of London as **China Radio International (CRI)** is brought to the capital for the first time by **World Radio Network (WRN)** and **Spectrum Radio 558AM**.

The daily international English-language news and current affairs programme from CRI will be broadcast on Spectrum 558AM at 2300 each weekday evening, live from Beijing. In each programme the day's news headlines are followed by half-an-hour of political, business and current affairs commentary. The CRI broadcasts have regular reviews of the Chinese press as well as extensive coverage of sports, the environment, tourism and technology developments in the region.

Vintage Fair

The **National Vintage Communications Fair** is an antique-type collectors fair specialising in early technology and featuring thousands of rare and collectable items such as early radios, television receiver, gramophones, telephones, classic valve hi-fi and all manner of electrical and mechanical antiques and collectables.

For the seasoned collector, attending the 'Fair is a must, and not only useful for seeking out that special elusive item, but also for buying materials, circuit diagrams or spare parts to complete a restoration project. For newcomers thinking about starting a collection, help and advice are always on hand from many of the country's leading collectors' clubs, societies and specialist magazines.

This year, the show will be held on **Sunday 30th April 2000** at Hall 11 at the NEC in Birmingham. Open from 1030 till 1600, admission is £5. More information from **Sunrise Press, Spice House, 13 Belmont Road, Exeter, Devon EX1 2HF** enclosing an s.a.e. or alternatively telephone Sunrise Press on **(01392) 411565**.



CRI has 29 news bureaux around the world that provide international news, while a range of reporters across China bring in-depth coverage of the major news stories across the world's most populous country as well as daily coverage of events in Hong Kong and the recently returned territory of Macao. China Radio International on Spectrum Radio 558AM is set to give listeners in London a unique insight into China's daily life, it's history and it's future.

China Radio International's London debut has been made possible by World Radio Network. The programme is being downlinked from satellite at WRN's Technical Operations Centre in central London and relayed to Spectrum 558AM for broadcast.

Mr Xin Liancai, Director of International Relations at China Radio International said "I am pleased that new audiences in London will be able to obtain a new insight into China through CRI's programme". Jeff Cohen, WRN's Director of Development added, "WRN is delighted to be able to provide the technical expertise to bring CRI's programme to London. We believe it will be a great success".

China Radio International will also be broadcasting a daily programme on four of WRN's international radio networks. This is the first time that a broadcast from China Radio International has been made so widely available on mainstream radio instead of the conventional short wave that international broadcasters rely on.

In Europe, the CRI programming will be heard on the WRN1 English Network and a German language programme from CRI will also go out on new EuroMax Deutsch network, WRN's 24/7 German language channel, launched back on 18 January. To North America, the CRI programme will go out on the hugely successful World Radio

Network from NPR overnight service, now heard on over 20 NPR member stations across the USA, including WNYC in New York City and WAMU in Washington DC.

CRI programming will also go out on WRN's North America 24 hours-a-day radio network available via satellite, cable and local a.m. and f.m. rebroadcasters across the US.

DX Meeting

The next **Manchester DX Meeting** will take place on **Wednesday 29th March**. The gathering is organised by members of the British DX Club, but all radio listeners and hobbyists are invited to join them. Bring along your latest loggings and QSLs to the Lass O'Gowrie pub on Charles Street, Manchester, off Oxford Road near the BBC, from 2000, or join them earlier for their usual pre-meeting meal at the Beijing Chinese Restaurant, Portland Street, from 1800 - three course meal for £4.95! Further information from **Tom Read** on **(01625) 612916** or E-mail: **tommyread@hotmail.com**

Pilot Schemes

The **British Wireless for the Blind Fund** has introduced pilot schemes into six areas of the UK enabling registered partially sighted people in need to receive specially adapted audio equipment on permanent free loan for life. At present the Fund provides radios, radio cassette recorders, CD radio cassette recorders and television sound receivers to registered blind people. The criteria for

Continued on page 10...

rallies

Attention Please!

Would you like to have your Rally publicised? If so, all you have to do is put together as much information as possible about the Rally, i.e. date, location, times, who to contact, etc. and send it to the Editorial Offices.

2000

March 26: The Limerick Radio Club is holding its annual rally and Radio, Electronics & Computer Fair in the Limerick Inn Hotel, commencing at 1200. This is their 'Millennium Special' show which will have a much larger than usual floor area within the hotel. Yaesu UK will be there for the first time to the Republic of Ireland to exhibit their wares. All the usual traders have been given extra space and promise to have a much larger range of items on display.

March 26: The Scottish Thistle Amateur Radio Convention (formerly the Magnum Rally) will be held, as usual, in the Magnum Leisure Centre, as in previous years. Traders will be allowed to set up their tables from 0800 on the morning of the rally. Tables will be cheaper than previous years due to low overheads so any traders wishing to book will pay £5 per table. Further details from **Helen Mason** on **(01294) 550688**.

March 26: The Barry Amateur Radio Rally has been renamed and is now known as 'The Welsh Amateur Radio Exhibition Incorporating Computing & Internet'. This year's will be the best yet, featuring a 'Multimedia Shack' presentation with live demonstrations of computer aided station management, computer rig control, scale models of AMSAT satellites, 'live' fast scan TV and many digital modes including 'live' APRS presented by Kenwood UK. Returning to the original venue: the newly refurbished Memorial Hall, Barry, South Glamorgan, with ample parking and licensed bar and catering. The exhibition opens at 1000 for the disabled, 1030 to the general public and 'officially' opened at 1130. Further information from **Brian Brown** on **(01222) 832253**.

April 9: The West Manchester Radio Club are holding their Red Rose Rally at the Horwich

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REVIEWED!



Rob Mannion G3XFD reviews the brand new
Icom IC-756PRO h.f. & 50MHz transceiver.

If you want to know what he makes of this new
rig then why not pick up a copy of the
May 2000 *PW*? It could be the best
thing you've done all year!

Richard Newton GORSN reviews
the **IC-T81E quad-band hand-held**
released by **Icom** last year. What will
he make of it? Pick up a copy of the
May 2000 *PW* to find out!



PW will be the **first** to review the all-new
Kenwood TM-D700E Data Communicator
thanks to **Kenwood UK**. **Kevin Nice G7TZC**



has been given the
arduous task (we don't
think!) of reviewing
this long-awaited piece
of kit - pick up the May
issue to find out what
he discovers.

BUILD!

Clive Hardy G4SLU's 28MHz Pre-Amplifier
and '**A Simple Capacitance Meter**' courtesy
of **James Brett G0TFP!**

FEATURES

Ben Nock G4BXD brings you his article on
'The 80m PB QRP Transceiver', **Phil Cadman**
G4JCP tells you what he thinks is 'The Future
Of Amateur Radio', plus much more.

ANTENNAS-IN-ACTION

Tex Swann G1TEX has more antenna-related
news, reviews and projects for you next month.

Plus all your regular favourites including:

Radio Basics
Bargain Basement
Carrying on the Practical Way
Keylines
Looking At
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Valve & Vintage
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... continued from page 7

registered partially sighted people will be the same as for registered blind people - they must be resident in the UK, over the age of eight and in need.

Chief Executive Margaret Grainger is pleased to announce that pilot schemes have now been implemented in Cardiff, Newcastle, Perth and Kinross-shire, Kent, Hampshire and parts of Northern Ireland. "The inclusion of registered partially sighted people to our service was discussed at the Millennium Conference in 1998 with recipients and other interested parties. We felt it was very important to be able to offer our service to registered partially sighted people in need as well as registered blind people. We are all too well aware that

there are some people who fall outside our criteria at present but whose need is as great as those who we help. In order to move forward, it was decided that we would run pilot schemes to enable us to evaluate the response and these are now in operation. We will look at the results early next year and decided whether we will be able to open up our service to the whole of the country".

The original charity was founded in 1929 and

British Wireless
for the
Blind Fund



Radio & TVDX News

The RSL-TV station on the Isle of Wight - 'TV-12' - has now extended coverage to the West Wight from the Rowridge transmitter using the existing main channel E54 @ 2kW horizontal. Meanwhile, the Local Independent Television Network (LITN) that represents the interests of the RSL TV stations is seeking urgent discussion with the Department for Culture, Media and Sport after the ITC put a hold on future RSL TV applications (for transmit frequencies) pending sorting out the channel allocations for expansion of the national terrestrial digital TV services (DTT).

The French meanwhile are alarmed that they're being left behind in DTT expansion across Europe. Their government is to accelerate legislation to introduce digital TV, reckoning that the first decoders will be available by end 2001 (having confirmed a transmission standard!). Chris Smith, the UK's Media Secretary, will announce plans for a phased shut down of the analogue transmission network in March.

The European terrestrial digital TV standard - COFDM - has not been adopted by the Americans (the Australians may follow the USA) who have opted for the 8-VSB standard. It has been confirmed that COFDM is much more robust in difficult receive conditions - particularly in heavily built-up areas that suffer ghosting.

The 8-VSB suffers reception breakup in city locations and the Department of Defence (Washington) have lobbied the FCC to reconsider opting into COFDM rather than staying with the already tested and in partial use 8-VSB standard. The main networks and individual stations have already invested billions of dollars into 8-VSB and are obviously reluctant to change so late into the new COFDM technology.

February 4th and the FCC ruled out any re-consideration and change of the adopted 8-VSB standard claiming that it will work. Media expert Mark Aitken commented that "Over the air TV is facing a disastrous situation...what the public is being offered as digital TV doesn't work". (Broadcast, 11 Feb).

DAB digital radio continues to expand in Germany and another Band 3, ch.E12 transmitter has been closed down - that of Sonneberg which has been moved to u.h.f. ch. E44. Ch.E12 - 224-230MHz.

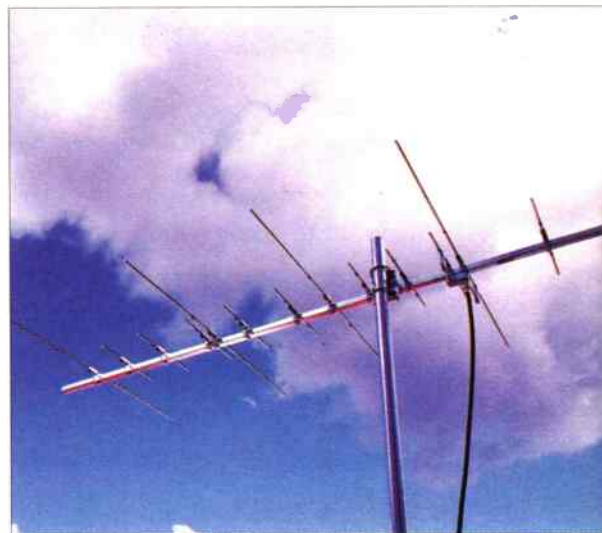
since that time British Wireless for the Blind Fund have provided over three quarters of a million radios to registered blind people, resident in the UK who are in need of wireless listening.

More information from **Gabriel House, 34 New Road, Chatham, Kent ME4 4QR, Tel: (01634) 832501, FAX: (01634) 817485** or visit their web site at: www.blind.org.uk

New Product

Now available from **Waters & Stanton PLC** is a new dual-band Yagi antenna. This new Yagi will fulfill a wide-felt need for a compact antenna that offers realistic gain and performance when used with today's dual-band transceivers.

Featuring nine elements for 70cm and five elements for 2m, it is able to provide useful directional gain and offers a low profile installation. The elements are all mounted on the same boom, resulting in lower wind loading and enabling even the most modest of TV rotators to turn the antenna. Elements made from solid material, provides greater strength and excellent durability.



Matching is achieved by the classic gamma method, regarded by many as the perfect means of achieving optimum impedance and balance. The DBY2759 antenna employs a revolutionary dual gamma match, which enables a single feeder to be employed. Although adjusted for the centre of each band, it is possible to 'pull' the resonance slightly by the user if a particular area of the band is of main interest. However, the bandwidth of this design is quite broad, due to the matching employed and the stated v.s.w.r. is well below 2:1 across the whole band with a claimed near 1:1.2 at resonance.

Manufacturers' tests have shown little, if any, compromise in this dual-band design, and for those who want a compact system, the DBY2759 offers a great deal of performance and value. The supplied mounting brackets enables the DBY2759 to mount on a wide variety of masts and the boom can be adjusted for vertical or horizontal polarisation. Maximum mast size is 57mm.

The DBY2759 dual-band Yagi has a retail price of £79.95 inc. VAT, contact Waters & Stanton PLC at **Spa House, 22 Main Road, Hockley, Essex S55 4QS, Tel: (01702) 206835/204965, FAX: (01702) 205843, E-mail: sales@wsplc.demon.co.uk** for more details.

Titanic Wireless Receiver Discovered

A unique and valuable Edwardian crystal receiver, made in England in 1910, has recently been unearthed by a Midlands antique dealer, and has been acquired for a major private wireless collection in this country.

Early radios of this period are rare enough, but that makes this particular set especially unique is that its maker, Mr George Leadbetter (a machine turner and clock repairer then living in Ledbury, Worcestershire), while listening in on the set's earphone on the morning of Monday 15th April 1912, suddenly tuned into the sinking's *Titanic* CQD/SOS Morse distress signals. Unfortunately, having run round to the local police station to tell the sergeant what he had heard, he was turned away, none of the police officers on duty believing what he had to say!

It would be difficult to know what help Mr Leadbetter's news could have been had he been believed (the *Titanic* was some 3000 miles away across the other side of the Atlantic), but help was nearby and the distress signals were picked up by ships close at hand, resulting in the rescue of over 700 passengers and crew. Such a pivotal role did wireless play in saving many hundreds of lives on board the stricken ship that its value was dramatically demonstrated and acknowledged around the world.

This beautiful, engineer-made radio (measuring some 2 feet long x 14in x 9in and weighing 42lb (18kg), is the only surviving radio receiver documented as having heard the distress cries from the *Titanic* - a fantastic relic from this most famous of historic disasters.

The receiver will be on show in pride of place



at the next National Vintage Communications Fair, which will be held at the NEC in Birmingham on Sunday 30th April 2000. Other exhibition items on show at the fair will be a comprehensive collection of WWII spy radio transmitters and receivers, a Horophone time-signal receiver (another unique Edwardian radio) and a display depicting the history of recorded sound.

Above: The 'Titanic Crystal Set' - a unique wireless receiver made in 1910 to pick-up the distress signals sent out from the sinking Titanic. On show at the National Vintage Communications Fair at the NEC in Birmingham on Sunday 30th April 2000.

rallies *continued*

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

Leisure Centre, Horwich, Bolton, Lancs, off Jnc6 M61. Doors open 1100 (1030 for disabled visitors). Admission by programme which costs £1.50, £1 for OAP on the door. There will be the usual stands, refreshments, Bring & Buy - any one item cost £2 to enter, no sales, no fees. **Don Aitchison G3BSA**, Rally Secretary, on (01942) 871620.

April 16: The 16th Yeovil QRP Convention is to be held at Digby Hall, Sherborne, Dorset. Doors open at 1000, talk-in on S22. There will be traders, construction challenge contest judging, three talks, QRP forum, in-hall catering, free parking, invalid facilities. Further details on (01935) 813054.

April 16: Swansea ARS will be holding their annual show in the Swansea Leisure Centre on the A4067 Swansea-Mumbles coast road. Doors open 1030-1700 and attractions include: trade stands, Bring & Buy, local interest groups and full catering & licensed bar. Admission is only £1, children just 50p. Further details from **Roger Williams GW4HSH**, Show Secretary, on (01792) 404422.

April 16: The Cambridgeshire Repeater Group are holding their annual rally at Bottisham Village College, Bottisham, which is about 10km east of Cambridge, access is via A14 and A1303. Features include a large hall, car boot sale, Bring & Buy and their renowned auction of radio and electronic equipment. Doors open 1030 and admission is £1.50. Refreshments available. Talk-in on S22. **Paul Oyke G0LUC** on (01462) 683574.

April 22: The Crystal Palace & District Radio Club are holding a Spring Sale, Amateur Radio, Electronics, Computing, Tools, etc. at St. John's Hall, Sylvan Road, London, from 1030 till 1300. Admission is just £1 (includes one free drink), children free. Refreshments will also be available. More information from **Bob G300U** on (01737) 552170.

April 30: The 14th Rainham Radio Rally is to be held at the Rainham School for Girls, Derwent Way, Rainham, Kent. Doors open 1000 (0930 for disabled visitors and items for Bring & Buy). Admission is £2, under 14s free. There will be a good mix of traders, selling new and used amateur radio equipment, electronic components, computers, etc. Many special interest groups will be represented also. Food and refreshments available. Talk-in on S22. Plenty of off-road parking. More information on (01634) 365980 or E-mail: **martinm0aak@yahoo.com.uk**

April 30: The Lough Erne Mobile Rally takes place at the Killyhelvin Hotel, Enniskillen, starting at 12 noon. There will be the usual trade stands plus a Bring & Buy, etc. Everyone welcome. More information from **Joe Maguire** on (02866) 323196/324796.

May 1: The Dartmoor Radio Rally is to be held at Pannier Market, Tavistock, Devon. In the same new location as last year giving much more space for traders and visitors than in the past, with access for disabled visitors. There is plenty of free public parking within five minutes walking distance. There will be trade stands, a Bring & Buy, refreshments, etc. Doors open 1030. Talk-in on S22. Beautiful

views over Dartmoor, ideal for picnics - bring the family. **Ron G7LLG** on (01822) 852586.

May 7: The Drayton Manor Radio & Computer Rally will be taking place at Drayton Manor Park, Fazeley, Tamworth, Staffs on A4091. Main traders in four marquees, large outside traders flea market, Bring & Buy stall, local clubs and special interest stands. Opens 1000 onwards. Trade information from **Norman** on 0121-422 9787, other information from **Peter G6DRN** on 0121-443 1189, evenings please.

May 14: Dunstable Downs Radio Club will be holding its 17th Annual National Radio Car Boot Sale at Stockwood Country Park, Luton, Bedfordshire. Site will be open from 0900-1500. Leave M1 at Jnc J10a and follow signs for 'The Mossman Collection'. Talk-in on S22. For further details and booking form access: **www.ddrcbootsale.freemove.co.uk** or write to **DDRC, PO Box 4053, Dunstable, Bedfordshire LU5 5ZJ** enclosing an s.a.e., FAX enquiries to (01525) 383898 or E-mail: **ddrc@magstripe.demon.co.uk**

May 21: The Three Counties Radio & Computer Rally is to be held at Perdiswell Leisure Centre, Bilford Road, Worcester. There will be trade stands, radio and computer dealers, parts and accessories, refreshments, licensed bar and free car parking. Admission will be £2 and there will be a free raffle with good prizes. Trade stands available, contact **Eddie Cotton** on (01905) 773181.

May 21: The Mid Ulster ARC Rally will be held in the Silverwood Hotel, Lurgan, Co. Armagh at 1200. Trade stands, Bring & Buy, etc. Talk-in on S22. Further details from **Jim G10ND** on 0283-885 1179.

May 28: The East Suffolk Radio Rally (the Ipswich Radio Rally) will take place at 'The Hollies', IACSSA, Straight Road, Foxhall, Ipswich. The ESWR is now principally a large car boot sale with indoor trader and special interest group support. Open from 0800 for traders and 0930 for buyers. In common with many rallies, the event will close mid afternoon. Talk-in will be provided on S22. Further details from **Sam Jewell G4DOK** on (01394) 448495

June 4: The Mansfield Amateur Radio Society's annual Radio & Electronics Car Boot Sale is to be held at Debdale Lane Sports and Social Club, Debdale Lane, Mansfield Woodhouse, Notts, commencing at 1000. Bar, refreshments and ample parking available. Details from **Angela** on (01623) 429218, E-mail: **andange@netscapeonline.co.uk** or for the latest information visit **http://members.netscapeonline.co.uk/andange/rally.htm**

June 4: The 4th Red Rose QRP Festival is to be held at Formby Hall, Alder Street (off High Street), Atherton, Manchester, between 1100 and 1600. There will be trade and club stands. There is a huge car park, disabled facilities, refreshments and bar. Display of Morse keys and QRP rigs, plus a low cost Bring & Buy. Admission is £1. More details from **Les Jackson G4HZJ**, 1 Belvedere Avenue, Atherton, Manchester M46 9LQ or telephone (01942) 870634.

■ Peter Shore, c/o SWM EDITORIAL OFFICES, ARROWSMITH COURT, STATION APPROACH, BROADSTONE, DORSET BH18 8PW.

■ E-MAIL: peter.shore@pwpublishing.ltd.uk

Bandscan Europe

I've made the move to widescreen digital television. I got fed up with the black bars at the top and bottom of many drama programmes on BBC and ITV and so took the plunge and invested in a new 16:9 television and an On Digital box. It took just a few minutes to set up the two pieces of kit when they arrived (I got the television through the QXL Internet site at www.qxl.com and saved myself around £400 on the retail price) and then I was ready to watch.

There was no problem in getting the digital signal and I have been enjoying the delights of widescreen drama with Dolby Surround Sound over the past few weeks. I recommend digital television to you, but for the moment steer clear of an integrated digital television sets. One manufacturer told me that the life span of integrated set falls well short of the 18 years I had the last TV set for. It seems separate boxes last longer...!

Domestic broadcasting here in the UK has undergone some changes in the first few months of the year. National medium wave commercial station Talk Radio was rebranded in January as talkSport. The station operates on 1053 and 1089kHz and is also available via the Internet.

Licence Fee

In February, the UK government announced that the BBC licence fee will rise from £101 to £104, partly to offset the move into digital broadcasting. However, the BBC will have to go through much greater consultation before launching new channels.

The Corporation came under fire from the commercial sector for starting digital television channels such as BBC News 24 and BBC Choice. It will face increased scrutiny in the future, which could affect its ability to launch new digital radio services such as the archive channel it proposed in early 1999.

Three bids went in to the UK Radio Authority for the second London-wide digital radio multiplex in mid-January. MXR, a consortium led by Chrysalis Group, the owners of the Heart and Galaxy radio brands is competing with Score Now, a grouping of Scottish Radio Holdings and Guardian Media Group, and Switchdigital that brings together The Wireless Group (owners of talkSport), Ginger Media (Virgin Radio), Clear Channel and the Carphone Warehouse.

The Radio Authority's decision is expected in April. Meanwhile, the first London commercial digital radio service is due to go on the air in May. Owned by Capital and Emap Radio, the London service will be joined by digital radio services in Birmingham and Manchester, also operated by Capital and Emap.

National Service

Capital Radio got its first national service at the end of January when it launched *Life* on the national digital radio multiplex known as Digital 1. But despite all this interest from the broadcasters, listeners are less enthusiastic.

Only around 6,000 digital radio sets have been sold in the UK - many to broadcasters themselves - and it is unlikely that the high prices will fall for several more months. It currently costs a minimum of £500 for a DAB hi-fi tuner, and an in-car set is priced at anywhere from £600 to £1200.

However, there is better news on the horizon. Roberts Radio are developing a portable set and there's news of a

combined mobile 'phone and digital radio receiver that might make it on to the market by Christmas this year. (*I've seen the prototype in our Editorial Offices, it worked well here, even in fringe conditions - Ed.*) Keep reading 'Bandscan Europe' for the most up-to-date news about digital radio in Britain!

Keen To Move

Across in Europe, China is keen to move its English-language programmes into the continent and has popped up on the medium wave band in London. Since January, an hour of China Radio International has been heard on Spectrum Radio on 558kHz at 2300 on weekday evenings. The 558kHz transmitter is at Crystal Palace, home to the BBC's domestic television and radio transmitters, and can be heard across and right around Greater London, despite its relatively low power of just 800W.

The programme is news and current affairs plus features, and seems to be the normal CRI output to be heard on short wave. In my opinion, the programmes are rather boring, but do let me know if you disagree! I don't know whether CRI has a policy for issuing QSL from overseas relays. The Beijing-based station has an outlet in Washington DC, USA, with similar material being broadcast.

China's position is a marked contrast with the Voice of America's current thinking. It is cutting back its language services to Europe this summer, following a virtual cessation of the English to Europe service some months back.

Czech, Hungarian, Latvian, Lithuanian, Slovene and Polish will all be severely reduced. VoA will in future concentrate on Africa and Asia where it believes its programmes are more valued and needed.

BBC World Service has joined the growing ranks of broadcasters using the new WorldSpace satellite radio service. It started a three-month trial in January, beaming programmes in English to Africa in digital quality.

Jamming is apparently back. The Persian services of the BBC and VoA have been suffering interference since February, just before elections in the country. Radios Free Europe and Liberty are also affected.

Merlin Network One

George Wood of Radio Sweden's *Media Scan* reported in late February that Merlin Network One will end soon. The service that started almost two years ago as an aggregation of programmes from programme producers like Radio Caroline has been cut back over recent months and the multi-frequency simulcast on short wave in parallel with satellite on Astra and Sirius has been reduced to just a couple of frequencies.

The Merlin Network One brand is expected to be dropped as the satellite relays cease and Merlin Communications will simply relay programmes on its short wave facilities in the UK and other transmitting stations around the world.

Hungarian Radio plans to launch programmes in French, Italian and Spanish. The external service is benefiting from profits that the parent organisation has made and sees it important to reach audiences in these languages following Hungary's accession to NATO and planned integration into the European Union.



No News

Still no news on the Radio Luxembourg project. Regular readers will remember that the Great 208 was due to come on the air in English once again. It's still carrying RTL in German! BBC Radio 2 carried a celebration of Luxembourg in February, it might have been a good occasion to launch the revitalised station.

That's all for this month, so until we focus on Europe again in three months, good listening!

■ BRIAN ODDY G3FEX, THREE CORNERS, MERRYFIELD WAY, STORRINGTON, WEST SUSSEX RH20 4NS

LM&S



The quarterly list of equipment used by the contributors to LM&S is featured this month. A number of portable receivers are listed, some of which perform quite well with their built-in antenna(s). A portable receiver can be especially useful for searching the broadcast bands when away from home but their performance cannot be compared with that of a communications receiver plus separate antenna.

There are a number of new communication receivers available on special offer just now (see SWM adverts) so this could well be the time to purchase one. A receiver and antenna work together as a team, so be sure to employ a suitable antenna too!

Long Wave Reports

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

Favourable conditions for the reception of the broadcasts from Ríkisutvarpid (RUV) in Reykjavik via their 300kW outlet at Gufuskalar, W.Iceland on **189kHz** were observed during some nights in January. After midnight on the 5th, **Eddie McKeown** (Newry, Co.Down) was delighted to hear them relatively strongly. He rated them SINPO 34232 at 0128UTC. In Liverpool, **Robert Hughes** rated their transmission as 33222 at 2335. **Ernie Strong** (Ramsey, Cambs) logged it as 22232.

Medium Wave Reports

The broadcasts from a few of the many m.w. stations in Canada and E.USA reached the UK at night during January. **Robert Connolly** (Kilkeel, Co.Down) picked up his first transatlantic DX of the winter during the early hours of January 2. He logged CKVO in Clarendville, NF on **710kHz** as SINPO 33333 at 0240UTC; CHAM Hamilton, ON on **820** as 23332 at 0250; WOCM St.John's, NF on **590** as 22222 at 0300; WCMQ Miami Springs, FL on **1700** as 22222 at 0310. Nothing was then heard until the 6th when CKVO peaked 22222 at 0120.

Slightly more favourable conditions were evident on the 8th, when he logged CKVO as 32332 at 0205 and CHAM as 22332 at 0210. On the 16th he rated CKVO as 23322 at 0210, CHAM as 22332 at 0225 and WCMQ as 22222 at 0240. During the night of February 7, **Harry Richards** (Barton-upon-Humber) heard WNRB in Boston, MA on **1510**. Their transmission rated 24232 at 0450 but "when nearby powerful European stations opened up it faded out".

Quite a few of the broadcasts from m.w. stations in the Middle East, N.Africa, Europe and Scandinavia reached the UK after dark - see chart. Those from R.Denmark have been attracting the attention of **Martin Cowin** (Kirkby Stephen) because they re-started broadcasting in English on January 3. Their news bulletins in English may be heard on **1062kHz** at 0740UTC, 1000 1610 and 2100UTC (Mon-Fri). He says "I've listened at 2100UTC and reception is great!"

My thanks to **B.A Watt** of W.London for informing me that 'Talk Radio UK' has become 'Talk Sport'. Their broadcasts now cover a wide range of sporting topics.

During daylight the broadcasts from some local radio stations reached quite distant places - see chart. Whilst driving to Tenby, S.Wales, **Simon Hockenhull** (E.Bristol) used his car radio to monitor Classic Gold (Bristol) via Mangotsfield on **1260kHz** and BBC R.Bristol via Mangotsfield on **1548**. He could still receive the latter as he entered Tenby!

Short Wave Reports

At present only three broadcasters are active in the **25MHz (11m)** band - Deutsche Welle (DW), Radio France International (RFI) and Radio For Peace International (RFPI), Costa Rica. It is not known how well their broadcasts reach the intended target areas but those from DW and RFI were received by some listeners in the UK:-

DW on **25.740** (Ger to S & SE.Asia? 0800?-1400?) was rated 44434 at 0800 by **Vic Prier** in Colyton; 25322 at 1041 in Newry; 35433 at 1050 by **Fred Wilmshurst** in Northampton; 35522 at 1145 in E.Bristol; 34333 at 1150 by **Rhoderick Illman** in Oxted; SIO 433 at 1200 by **Philip Rambaut** in Macclesfield; 35533 at 1244 by **Martin Goodey** in St.Mary's, Is of Scilly; 25444 at 1250

by **Mike Casey** in Manchester

RFI on **25.820** (Fr to E/C.Africa 0900-1300) was rated 25232 at 1042 in Newry; 35433 at 1045 in Northampton; 35444 at 1115 in Colyton; 23332 at 1120 in Kilkeel; 25422 at 1140 in E.Bristol; 34333 at 1153 in Oxted; SIO 333 at 1157 in Macclesfield; 35433 at 1210 in St.Mary's, Is; 25444 at 1251 in Manchester.

In contrast, there is a high level of activity in the **21MHz (13m)** band. Before noon the occupants include R.Finland via Pori? **21.670** (Eng to Asia, Australia 0730-0800), rated 44444 at 0745 by **Stan Evans** in Herstmonceux; R.Australia via Shepparton **21.820** (Eng to Asia 0900-1400) 35433 at 0907 in St.Mary's, Is & 35553 at 1133 by **David Edwardson** in Wallsend; R.Austria Int, Moosbrunn **21.765** (Eng to Australia 0930-1000) 45354 at 0930 in Newry; R.Prague, Czech Rep **21.745** (Eng to Asia 1000-1030) 45544 at 1000 in Colyton; R.Pakistan **21.460** (Ur to Eur 0800?-1100, Eng 1100-1105) 54433 at 1046 in Oxted; Vatican R, Italy **21.850** (It, Fr, Eng to Eur?, Asia?) 45544 at 1107 in Northampton; DW via ? **21.780** (Eng to Africa 1100-1157) 25533 at 1115 in E.Bristol; Swiss R.Int via Sottens **21.770** (Eng, Ger, Fr, It to Asia 1100-1330) 43444 at 1120 in Liverpool.

After mid-day they include RAI Rome **21.520** (It to Africa 0600-1300), rated 33333 at 1200 by **Thomas Williams** in Truro; HCJB Quito, Ecuador **21.455** (Eng [u.s.b. + p.c.]) SIO 333 at 1205 in Macclesfield; R.Ukraine Int **21.510** (Eng to Australia 1200-1300) 44444 at 1215 by **Sheila Hughes** in Morden; R.Sweden, Stockholm **21.810** (Eng to N.America? 1230-1300) 32323 at 1258 by **Robert Beason** in Nottingham; UAER, Dubai **21.605** (Eng to Eur 1330-1350) 44554 at 1348 in Manchester; BBC via Cyprus **21.470** (Eng to E.Africa 1300?-1700) SIO 545 at 1400 by **Tom Smyth** in Co.Fermanagh; R.Prague, Czech Rep **21.745** (Eng to N.America? 1400-1430) 44344 at 1415 by **Peter Pollard** in Rugby; R.Sweden, Stockholm **21.810** (Eng to N/C.America 1430-1500) 34333 at 1449 by **Vera Brindley** in Woodhall Spa; Voz Christiana, Chile **21.500** (Sp to N.America 1100-2100?) 43444 at 1610 by **David Hall** in Morpeth; WYFR via Okeechobee, USA **21.525** (Fr to Eur, Africa 1800-?) 33333 at 1805 by **Bernard Curtis** in Stalbridge.

Noted in the **18MHz (15m)** band during the afternoon were R.Sweden, Stockholm **18.960** (Eng to N.America 1430-1500), rated 54444 at 1432 by **Tom Winzor** in Plymouth; R.Norway Int **18.950** (Norw to N/C.America 1700-1730) 35343 at 1710 in Northampton.

In the **17MHz (16m)** band R.New Zealand's broadcasts have been attracting the attention of some listeners in the UK. Their 100kW transmission to Pacific areas on **17.690** (Eng 1750-1005) was rated 44434 at 0820 in Oxted. They also have a special programme for Troops in E.Timor on **17.690** from 1005-1205 daily - it was rated 35543 at 1008 in Wallsend & 33333 at 1200 in Truro. R.Australia has also been reaching the UK in this band. Their transmission to Asia on **17.750** (Eng to 0000-0500, 0600-0830, 0830-1100) was rated 25532 at 0840 in E.Bristol.

Also received here during the morning were the Voice of Russia **17.495** (Eng to Australia, New Zealand 0700-1000) rated 44444 at 0725 in Herstmonceux; BBC via Skelton & Woofferton, UK **17.640** (Eng to E.Eur, M.East, E.Africa 0700-1500) SIO 555 at 0900 in Co.Fermanagh; DW via Sri Lanka **17.820** (Eng to Asia, Oceania 0900-0950) SIO 444 at 0911 by **Francis Hearne** in N.Bristol; AIR via Delhi? **17.835** (Eng to Pacific areas 1000-1100) 34343 at 1038 in Newry; R.Pakistan, Islamabad **17.835** (Ur 0900?-1100, Eng 1100-1105 to Eur) 33333 at 1100 in Plymouth.

After mid-day, R.Bulgaria, Sofia **17.500** (Eng to Eur 1200-1300) was 55444 at 1220 in Northampton; Voice of Turkey **17.815** (Eng to ? 1330-1425)

Continued on page 15.

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	G*
153	Donebach DLF	Germany	1500	A,C,D,E,G,H,J
153	Bod	Romania	1200	G*
162	Allouis	France	2000	B*,C,D,E,F,H,J*,J
171	Nador Medi-1	Morocco	2000	G
171	B'shakovo etc	Russia	1200	D,E*,G*,H*,J
171	L'vov	Ukraine	500	C*
171	R.Ukraine	Ukraine	?	B*
177	Dranienburg	Germany	500	B*,C,D,E,H,J*
183	Saarlouis	Germany	2000	B*,C,D,E,F,G,H,I*,J
189	Gufuskalar	W.Iceland	150	B*,D*,G*
198	Droitwich BBC	UK	500	C,D,E,F,G,H,I*,J
207	Munich DLF	Germany	500	A*,D,E,G,H,J
207	Azilal	Morocco	800	G*
207	Kiev	Ukraine	500	G*
216	Roumoules RMC	S.France	1400	D,E,F,G,H,J
216	Ganca	Azerbaijan	500	D*
225	Polskie R-1	Poland	?	A*,C,B*,D,G*,H,J*,J*
234	Beidweiler	Luxembourg	2000	D,E,F,G,H,J*
243	Kalundborg	Denmark	300	A*,C,D,E,G,H,J*
252	Tipaza	Algeria	1500	C*,H*,J*
252	Atlantic 252	Eire	500	D,E,F,G,H,I*,J
261	Burg(R.Ropa)	Germany	85	A*,D,E,G,H,J*
261	Taldom Moscow	Russia	2500	G*
270	Topolna	Czech Rep	1500	A*,D,E,G,H,I*,J*
279	Sasnovy	Belarus	500	A*,C*,D,E,G*,H,J*

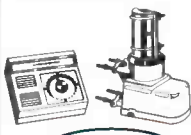
Note: Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

Listeners:-

- (A) Simon Hockenhull, E.Bristol. (F) Tom Smyth, Co.Fermanagh.
- (B) Robert Hughes, Liverpool. (G) Ernie Strong, Ramsey, Cambs.
- (C) Sheila Hughes, Morden. (H) Phil Townsend, E.London.
- (D) Eddie McKeown, Newry. (I) Thomas Williams, Truro.
- (E) George Millmore, Wootton, IoW. (J) Fred Wilmshurst, Northampton.

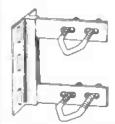
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LOG PERIODIC MLP32
 Freq. Range 100-1300MHz
 Length 1420mm Wide Band 16 Element directional beam which gives a maximum of 11-130db Gain Forward and 150db Gain Front to Back Ratio. Complete with mounting hardware. (The Ultimate Receiving Antenna - a must for the Dedicated Listener.)



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 * Rotation Torque-222Kg
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 * Control Box-230v AC
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IMPROVED RECEPTION

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 SINGLE 1 1/4"..... £6.00
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PL259/9..... 0.75 each
 PL259/6..... 0.75 each
 PL259/7 for mini 8 1.00 each
 BNC (Screw Type) 8 1.00 each
 BNC (Solder Type) 8 1.00 each
 N TYPE for N582.50 each
 N TYPE for RF213 ..2.50 each
 S0239 to BNC1.50 each
 PL259 to BNC2.00 each
 N TYPE to S0239 ..3.00 each

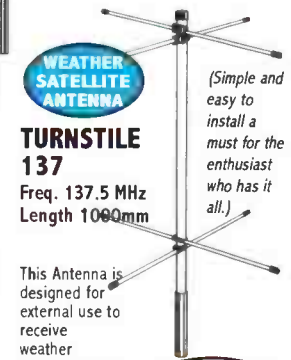
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RG213 MILITARY 0.85 per mtr.
 MINI RF8 0.85 per mtr.
 RG58 STANDARD 0.35 per mtr.
 RG58 MILITARY 0.60 per mtr.

MICRO MAG MTS42
 Freq. Range 25-2.1 GHZ
 Length 225 mm



£27.95



WEATHER SATELLITE ANTENNA
TURNSTILE 137
 Freq. 137.5 MHz
 Length 1000mm

(Simple and easy to install a must for the enthusiast who has it all.)

This Antenna is designed for external use to receive weather satellite signals.
 Complete with mounting hardware.

£39.95

£29.95

SUPER SCAN AIR BASE (Airband)
 (Stainless Steel)
 Freq. Range Receive 117-140MHz
 Transmit 117-140MHz
 Length 825mm
 Connector-N TYPE

This is a transmitting & receiving antenna designed for the aircraft frequency range. (For the control tower & aircraft listener.)

£29.95

SUPER SCAN STICK
 Freq. Range 0-2000MHz
 Length 1000mm

It will receive all frequencies at all levels unlike a mono band antenna. It has 4 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals. (Ideal for the New Beginner and the Experienced Listener alike.)

£49.95

£39.95

SUPER SCAN STICK II
 Freq. Range 0-2000 MHz.
 Length 1500mm.

This is designed for external use. It will receive all frequencies. at all levels unlike a mono band antenna. It has 8 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals plus there is an extra 3db gain over the standard super scan stick. (For the expert who wants that extra sensitivity)

£39.95

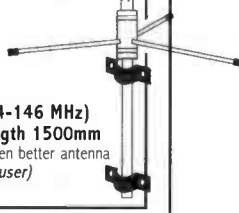
MULTISCAN STICK
 Freq. Range Receive - 0-2000 MHz.
 Transmit 144 - 146 MHz gain 2.5 DBd
 420 - 430 MHz gain 4.5 DBd
 Length 1000 mm.

Although marginally compromising sensitivity the multi scan stick has within its transmitting capabilities plus gain makes it an excellent antenna for the amateur and expert alike. Comes complete with mounting hardware and brackets. (Ideal for the amateurs ham radio - user).

£89.95

IVX 2000
 Freq. Range Receive - 0-2000 MHz.
 Transmit 50 - 52 MHz gain 2.00DBd
 144 - 146 MHz gain 4.00 DBh
 420 - 430 MHz gain 6.00 DBd
 Length 2.5 m.

For external use, but at a pinch can be used in the loft. It has been finely tuned to make this Antenna the best there is. It has stainless steel radials and hardware. (THE BEST)



MWA-H.F. WIRE ANTENNA
 Freq. Range 1.1-30MHz Adjustable Length up to 60 Metres

Internal or external use. The long wire is known to be one of the best antennas for shortwave (HF) receiving. Comes complete with con box and dog bones, wire etc. (A must for the short wave listener.)

£29.95

£29.95

SWP 2000 FREQ. 25 - 2000 MHz. Length 515mm.

Multiband good sensitivity for its small size. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. (Good for the car user who doesn't want an external antenna.)

£39.95

SWP HF30
 Freq. Range 0.05-30MHz Length 770mm

Although small, surprisingly sensitive for the H.F. user. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. (Good for the car user who doesn't want an external antenna.)

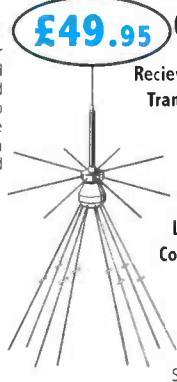
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TRI SCAN III
 Freq. Range 25-2000MHz
 Length 720mm

Desk Top Antenna for indoor use with triple vertical loaded coils. The tri-pod legs are helically wound so as to give it its own unique ground plane. Complete with 5mts of low loss coax and BNC plug. (Ideal for Desk Top Use.)

£34.95

ROYAL DISCONE 2000
 (Stainless Steel)
 Freq. Range Receive 25-2000MHz
 Transmit 50-52MHz
 144-146MHz
 430-440MHz
 900-986MHz
 Length 1540mm
 Connector-N TYPE

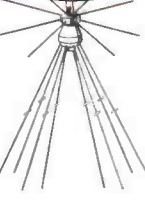


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The Ultimate Discone Design. 4.50B GAIN OVER STANDARD DISCONE!

Highly sensitive, with an amazing range of transmitting frequencies, comes complete with mounting hardware & brackets (The Best There is).

£39.95



SUPER DISCONE
 Freq. Range 25-2000MHz
 Length 1380mm

Internal or External use (A Tri-Plane Antenna). Same as the Super Discone but with enhanced HF capabilities, comes complete with mounting hardware and brackets. (Ideal for the Short Wave H.F. Listener.)

DISCONE
 Freq. Range 70-700MHz
 Length 920mm

Internal or External use. (Classic Antenna Design. Comes complete with mounting hardware and brackets. (Ideal for the Beginner).



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UK SCANNING DIRECTORY
 7th edition
£19.50

High Performance Super Magnetic Mount Antenna comes with Two Interchangeable Whips. 73mm 700-2.1 GHZ
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 Complete with high specification coax and BNC plug. (The Ultimate small Magmount Antenna.)

£19.95

G. SCAN II
 Freq. Range 25-2000 MHz.Length 620 mm.
 Magnetic mount Mobile Scanner Antenna. 2 vertical loaded coils for good sensitivity complete with magnetic mount and 4mts of coax, terminated with BNC plug. (Good for when you are driving about)

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43333 at 1330 by **Clare Pinder** in Appleby; Vatican R, Italy **17.515** (Eng to SE.Asia 1345-1405) 34554 at 1400 in Manchester; Israel R, Jerusalem **17.545** (Heb [Home Sce rly] to W.Eur, N.America) 54444 at 1440 in Liverpool; R.France Int via Gabon? **17.560** (Eng to E.Africa, M.East 1400-1600?) 44434 at 1457 in Woodhall Spa; Israel R, Jerusalem **17.535** (Eng to Eur, N.America 1500-1530) 44444 at 1505 in Rugby; WYFR Okeechobee, USA **17.510** (Eng, Ger to Eur 1600-1945) SIO 444 at 1600 in Macclesfield; R.Austria Int via Sackville, Canada **17.865** (Eng to N.America 1600-1630) 44444 at 1600 in Morden; WHRI via Maine, USA **17.650** (Eng to Eur, M.East, Africa 1600-2300) 33333 at 1715 in Stalbridge; HCJB Quito, Ecuador **17.660** (Eng to Eur 1900-2200) 33333 at 2012 in Nottingham; BBC via Ascension Is **17.830** (Eng to Africa 7-2100) 44544 at 2014 in St.Mary's, IoS; R.Nederlands via Bonaire, Ned Antilles **17.605** (Eng to Africa 1830-2025) 33333 at 2025 in Kilkeel; R.Canada Int via Sackville **17.820** (Fr, Eng to Eur, Africa 2000-2200) 45444 at 2132 by **Fred Pallant** in Storrington.

There is much to interest the listener in the **15MHz (19m)** band. Mentioned in the reports were R.Kuwait **15.110** (Eng, Ar to SE.Asia 0500-0930) rated 45333 at 0745 in Colyton; R.Australia via Shepparton on **15.415** (Eng to Asia 0100-0400, 0600-0900) 25422 at 0830 in E.Bristol; China R.Int via ? **15.210** (Eng to Australia 0900-1000) SIO 333 at 0909 in N.Bristol; RFI via Allouis? **15.195** (Eng to Eur, Africa 1200-1257) was SIO 222 at 1200 in Co.Fermanagh; R.Bulgaria **15.700** (Eng to W.Eur 1200-1300) 44444 at 1200 in Morden; RFI via Allouis? **15.155** (Eng to Eur, Africa 1200-1257) 33333 at 1234 in Plymouth; R.Romania Int **15.390** (Eng to W.Eur 1300-1356) 54553 at 1315 in Herstmonceux; WWCR Nashville, USA **15.685** (Eng to N.America, Eur 1300-2200?) 33333 at 1345 in Morpeth; R.Oman via Thurait **15.140** (Eng to M.East) 22222 at 1405 in Truro; Swiss R.Int via Sottens **15.185** (Eng, Ger, Fr to Asia 1400-1600) 55544 at 1435 in Northampton; V of Greece, Athens **15.630** (Gr, Eng to N.America? 1400-1500) 33333 at 1500 in Nottingham; VOA via Morocco? **15.205** (Eng to Eur, N.Africa, M.East 1400-1700) 45444 at 1437 by **Tony Hall** in Freshwater Bay, IoW; SLBC via Ekala, Sri Lanka **15.425** (Eng to Asia 1230?-1630?) 32223 at 1505 in Stalbridge; Israel R, Jerusalem **15.650** (Eng to Eur? 1500-1530) 44444 at 1505 in Rugby; WEWN via Vandiver, USA **15.745** (Eng to Eur 1100-2200?) SIO 433 at 1550 in Macclesfield; WYFR via Okeechobee **15.695** (Eng to Eur, Africa 1600-?) 35233 at 1620 in Newry; BBC via Seychelles **15.420** (Eng to E.Africa 1615-1700) 35553 at 1639 in Wallsend; R.Japan via Moyabi, Gabon **15.355** (Eng to Africa 1700-1800) 44344 at 1700 in Appleby; RFI via Allouis? **15.210** (Eng to Africa 1600-1730) 34333 at 1729 in Woodhall Spa; R.Romania **15.365** (Eng to ? 1700-1757) 45444 at 1735 in St.Mary's, IoS; Africa No.1, Gabon **15.475** (Fr to W.Africa 1600-1900) 34443 at 1748 in Storrington; BBC via Ascension Is **15.400** (Eng to Africa 0800-1130, 1500-2300) 43343 at 1910 in Liverpool; VOA via Greenville, USA **15.580** (Eng to Africa 1800-2200) 33333 at 2025 in Kilkeel; RAE Buenos Aires, Argentina 15.345 (Sp to Eur, Africa 2300-0000) 35353 at 2311 in Manchester.

Good reception from many areas has been evident in the **13MHz (22m)** band. Mentioned in the reports were Swiss R.Int via Sottens **13.685** (Eng, It, Ger, Fr to Australasia 0830-1030), rated 55544 at 0840 in Herstmonceux; R.Australia via Shepparton **13.605** (Eng to Pacific 0800-1200) 24232 at 1054 in Newry; R.Kuwait via Kabd **13.620** (Ar to Eur, N.America 0930-1605) 43344 at 1250 in Morpeth; R.Austria Int via Moosbrunn **13.730** (Eng to Eur 1330-1400) 44444 at 1330 in Truro; R.Sweden **13.800** (Eng to Pacific, Asia 1430-1500) 45434 at 1450 in Freshwater Bay, IoW; R.Bulgaria, Sofia **13.600** (Bul? to ?) 55544 at 1515 in Northampton; Croatian R, Zargreb **13.830** (Cr to N.America 1230?-?) 45444 at 1615 in E.Bristol; UAER, Dubai **13.675** (Eng to Eur 1600-1640) 44444 at 1630 in Woodhall Spa; R.Nederlands via Flevo **13.700** (Eng to Africa 1830-2025) 45434 at 1920 in Colyton; DW via Sines? **13.790** (Eng to W.Africa 2000-2050) 21112 at 2005 in Nottingham; RCI via Sackville, Canada **13.690** (Eng, Fr to Eur, Africa 2000-2300) 44344 at 2010 in Liverpool; VOA via Selebi-Phikwe, Botswana **13.710** (Eng to Africa 1600-2130?) 44444 at 2030 in Kilkeel; R.Havana Cuba **13.750** (Eng to Eur 2030-?) 32222 at 2030 in Appleby; RCI via Sackville, Canada **13.650** (Fr, Eng to Eur, Africa 2000-2200) 44444 at 2115 in St.Mary's, IoS.

Broadcasts from many areas has been reaching the UK in the **11MHz (25m)** band. Among those noted were R.Prague, Czech Rep **11.640** (Eng to N.Eur 1130-1157), rated 45433 at 1142 in Northampton; R.France Int via Allouis? **11.670** (Eng to Eur 1200-1257) 45554 at 1243 by **John Parry** in Larnaca, Cyprus; R.Romania Int **11.940** (Eng to Eur 1300-1356) 44444 at 1317 in Plymouth; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1100-1730) SIO 333 at 1400 in Co.Fermanagh; R.Canada Int via Skelton, UK **11.980** (Eng to Eur 1430-1500) 33233 at 1430 by **Gerald Guest** in Dudley; Swiss R. Int via

Singapore **12.010** (Eng, Ger, Fr 1400-1600) 43333 at 1430 in Morden; WWCR Nashville, USA **12.160** (Eng to N.America, Eur 1400-2200) 34323 at 1437 in Woodhall Spa; BBC via Skelton & Woofferton, UK **12.095** (Eng to Eur, N/W.Africa 0700-1900) 45444 at 1505 in Freshwater Bay, IoW; R.Australia via Shepparton 11.660 (Various to Asia 1430-1700) 43333 at 1600 in Morpeth; R.Pakistan, Islamabad **11.570** (Eng to M.East 1600-1615) 44243 at 1603 in Newry; R.Nederlands via Tashkent **12.070** (Eng to S.Asia 1430-1625) 34433 at 1620 in E.Bristol; R.Japan via ? **12.000** (Eng to ? 1700-1800) 42333 at 1700 in Appleby.

Later, the V of Tanzania, Dole **11.735** (Swah to E.Africa 1500-2000) was 33343 at 1803 in Storrington; Egyptian R, Abis **12.050** (Ar [Home Svce relay] to Eur, N.America 0200-0000) 44344 at 1905 in Liverpool; AIR via Bangalore **11.620** (Eng, Hin to Eur 1745-2230) 24232 at 1935 in Rugby; R.Nederlands via Madagascar **11.655** (Eng to Africa 1730-2025) SIO 444 at 1944 in N.Bristol; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 44444 at 2030 in Kilkeel; R.Nac da Amazonia, Brazil **11.780** (Port 0900-0200) SIO 333 at 2124 in Macclesfield; RCI via Sackville **11.945** (Fr, Eng to Eur, Africa 2000-2200) 44544 at 2130 in St.Mary's, IoS; BBC via Rampisham, UK **11.680** (Eng to Falkland Is 2130-2145, Tues & Fri) 22222 at 2132 in Nottingham; BBC via Ascension Is **12.095** (Eng to S.America 2000-0200?) 43333 at 2206 in Kirkby Stephen.

The occupants of the **9MHz (31m)** band include HCJB Quito, Ecuador **9.780** (Eng to W.America 0500?-0900?), rated 44444 at 0700 in Dudley; R.Vilnius, Lithuania **9.710** (Eng to Eur 0930-1000) 55544 at 0955 in Herstmonceux; R.Nederlands via Wertachtal **9.855** (Eng to Eur 1130-1325) 45444 at 1230 in Plymouth; R.Mediterranee Int, Morocco **9.575** (Ar, Fr to

Continued over.

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener	Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
1260	Brunel CG, Bristol	I	1.60	F	1260	SabrasSnd, Leicester	I	0.29	I,K
1260	R.York	B	0.50	A	1260	R.York	B	0.50	A
1278	Ci.Gold 1278 W.York	I	0.43	I	1296	Radio XL, Birmingham	I	5.00	A,B,D,F,I,K
1305	Premier via ?	I	0.50	D,F,I,K	1305	Premier via ?	I	0.50	D,F,I,K
1305	Touch AM, Newport	I	0.20	F	1305	Touch AM, Newport	I	0.20	F
1323	Capital G, Southwick	I	0.50	D,F,K	1323	Capital G, Southwick	I	0.50	D,F,K
1323	SomersetSnd, Bristol	B	0.63	B,E*,I	1323	SomersetSnd, Bristol	B	0.63	B,E*,I
1332	Premier, Battersea	I	1.00	D,F	1332	Premier, Battersea	I	1.00	D,F
1332	Ci.Gold 1332, Pt'bo	I	0.60	D,I,K	1332	Ci.Gold 1332, Pt'bo	I	0.60	D,I,K
1332	Wiltshire Sound	B	0.30	F	1332	Wiltshire Sound	B	0.30	F
1359	Ci.Gold 1359, C'try	I	0.27	D,I,K	1359	Ci.Gold 1359, C'try	I	0.27	D,I,K
1359	R.Solent	B	0.85	F	1359	R.Solent	B	0.85	F
1368	R.Lincolnshire	B	2.00	D,I,K	1368	R.Lincolnshire	B	2.00	D,I,K
1368	Southern Counties R	B	0.50	C,D,F,J	1368	Southern Counties R	B	0.50	C,D,F,J
1368	Wiltshire Sound	B	0.10	E*,F	1368	Wiltshire Sound	B	0.10	E*,F
1377	Asian Sd, Rochdale	I	0.10	A,D*	1377	Asian Sd, Rochdale	I	0.10	A,D*
1413	R.Gloucester via ?	B	?	F*,K	1413	R.Gloucester via ?	B	?	F*,K
1413	Premier via ?	I	0.50	D,I,K	1413	Premier via ?	I	0.50	D,I,K
1413	Fresh AM, Skipton	I	0.10	A	1413	Fresh AM, Skipton	I	0.10	A
1431	Breeze, Southend	I	0.35	D,I,J	1431	Breeze, Southend	I	0.35	D,I,J
1431	Ci.Gold, Reading	I	0.14	D,E*,F,K	1431	Ci.Gold, Reading	I	0.14	D,E*,F,K
1449	R.Peterboro/Cambs	B	0.15	D,E*,H,I,K	1449	R.Peterboro/Cambs	B	0.15	D,E*,H,I,K
1458	R.Cumbria	B	2.00	A,E*	1458	R.Cumbria	B	2.00	A,E*
1458	R.Devon & Dorset	B	0.50	A,F	1458	R.Devon & Dorset	B	0.50	A,F
1458	1458 Lite AM Manch'	I	5.00	E*	1458	1458 Lite AM Manch'	I	5.00	E*
1458	Sunrise, London	I	50.00	D,F,I,K	1458	Sunrise, London	I	50.00	D,F,I,K
1476	CountySnd, Guildford	I	0.50	D,E*,F	1476	CountySnd, Guildford	I	0.50	D,E*,F
1485	Ci.Gold, Newbury	I	1.00	D,K	1485	Ci.Gold, Newbury	I	1.00	D,K
1485	R.Humberside (Hull)	B	1.00	E*,I	1485	R.Humberside (Hull)	B	1.00	E*,I
1485	R.Merseyside	B	1.20	A,E*,F,H	1485	R.Merseyside	B	1.20	A,E*,F,H
1485	Southern Counties R	B	1.00	D,F	1485	Southern Counties R	B	1.00	D,F
1503	R.Stoke-on-Trent	B	1.00	A,C*,D,E*,F*,H,K	1503	R.Stoke-on-Trent	B	1.00	A,C*,D,E*,F*,H,K
1521	Breeze, Reigate	I	0.64	D,I,J,K	1521	Breeze, Reigate	I	0.64	D,I,J,K
1530	R.Essex, Southend	B	0.15	D,I,J	1530	R.Essex, Southend	B	0.15	D,I,J
1530	Ci.Gold W.Yorks	I	0.74	A,I	1530	Ci.Gold W.Yorks	I	0.74	A,I
1530	Ci.Gold Worcester	I	0.52	K	1530	Ci.Gold Worcester	I	0.52	K
1548	R.Bristol	B	5.00	D,E*,F,H	1548	R.Bristol	B	5.00	D,E*,F,H
1548	Capital G, London	I	97.50	A,D,F,I	1548	Capital G, London	I	97.50	A,D,F,I
1548	Magic1548, Liverpool	I	4.40	E*	1548	Magic1548, Liverpool	I	4.40	E*
1548	Forth AM, Edinburgh	I	2.20	D	1548	Forth AM, Edinburgh	I	2.20	D
1557	R.Lancashire	B	0.25	A	1557	R.Lancashire	B	0.25	A
1557	Ci.Gold 1557, N.hant	I	0.76	C,D,E*,I,K	1557	Ci.Gold 1557, N.hant	I	0.76	C,D,E*,I,K
1557	Capital G, So'ton	I	0.50	C,D,F	1557	Capital G, So'ton	I	0.50	C,D,F
1584	London Turkish R	I	0.20	D,I	1584	London Turkish R	I	0.20	D,I
1584	R.Nottingham	B	1.00	D	1584	R.Nottingham	B	1.00	D
1584	R.Shropshire	B	0.50	D	1584	R.Shropshire	B	0.50	D
1602	R.Kent	B	0.25	D,E*,F,I	1602	R.Kent	B	0.25	D,E*,F,I

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

- (A) Robert Connolly, Kilkeel.
- (B) Simon Hockenhuil, E.Bristol.
- (C) Sheila Hughes, Morden.
- (D) Brian Keyte, Bookham.
- (E) Eddie McKewon, Newry.
- (F) George Millmore, Wootton, IoW.
- (G) Clare Pinder, while in Appleby.
- (H) Tom Smyth, Co.Fermanagh.
- (I) Emie Strong, Ramsey, Cambs.
- (J) Phil Townsend, E.London.
- (K) Fred Wilmshurst, Northampton.
- (L) Tom Winoz, Plymouth.



N.Africa, S.Eur 0500-0100) 34433 at 1233 in Oxted; R.Polonia (Polish R, Warsaw) **9.525** (Eng to Eur 1300-1359) 32222 at 1312 in Rugby; R.Tashkent,Uzbekistan 9.715 (Eng to S.Asia 1330-1400) 34232 at 1338 in Newry; R.Veritas Asia, Philippines **9.670** (? to Asia) 45554 at 1415 in Larnaca, Cyprus; R.Australia via Shepparton **9.500** (Eng to Asia 1430-2130) 35444 at 1506 in Manchester.

Noted later, were VOA via Morocco? **9.760** (Eng to Eur, M.East, N.Africa 1700-2100), rated SIO 544 at 1820 in Macclesfield; V of Greece, Athens **9.375** (Eng, Fr to Eur 1900-?) 44444 at 1900 in Morden; V of Turkey, Ankara **9.630** (Eng to Eur, N.America 1930-2020) 55555 at 1930 in Liverpool; VOIRI Tehran, Iran **9.022** (Ger, Fr, Eng to W.Eur 1730-2030) 44444 at 1938 in Colyton; R.Thailand via Udon Thani **9.535** (Eng to Eur 2015?-2045) 44544 at 2028 in Wallsend; BBC via Kranji, Singapore **9.740** (Eng to Oceania 1700?-2200) 43443 at 2040 in Kilkeel; Africa No.1, Gabon **9.580** (Fr to C.Africa 0500-2200) 33443 at 2046 in Storrington; BBC via Skelton, UK **9.410** (Eng to Eur, N/C.Africa 1500-2100) 43333 at 2052 in Kirkby Stephen; RCI via Skelton, UK **9.805** (Fr, Eng to Eur, Africa 2000-2300) 35433 at 2105 in Northampton; V of Armenia via Kamo **9.965** (Eng to Eur 2055-2120) 22222 at 2114 in Nottingham; RCI via Sackville **9.770** (Fr, Eng to Eur, Africa 2000-2200) SIO 333 at 2148 in N.Bristol; R.Cairo, Egypt **9.990** (Eng to Eur 2115-2245) 55544 at 2150 in St.Mary's, IoS; R.Taipei Int via WYFR Okeechobee, USA **9.355**

(Eng to Eur 2200-2300) 44333 at 2200 in Appleby; AIR via Aligarh? **9.910** (Eng to Australia 2045-2230) 33333 at 2125 in Stalbridge; AIR via Bangalore **9.950** (Eng to Eur 2045-2230) 43433 at 2203 in Freshwater Bay IoW; Swiss R.Int via Montsireny, Fr.Guiana **9.905** (Eng, Sp, Fr, It, Ger to N/C.America 0100-0500) SIO 433 at 0400 in Co.Fermanagh.

Some of the broadcasts in the **7MHz (41m)** band are intended for European listeners. Those noted came from R.Japan via Woofferton, UK **7.230** (Jap, Eng 0500-0700), rated 44433 at 0650 in Herstoncross; V of the Mediterranean, Malta via Russia? **7.150** (Eng 0700-0730) 45544 at 0727 in St.Mary's, IoS; Christian Science via WSHB Cyprus Creek, USA **7.535** (Eng 0400?-1000?) 33233 at 0915 in Rugby; AWR via Forli, Italy **7.230** (Eng 0930-1000 Sun) 24222 at 0938 in Newry; WEWN Birmingham, USA **7.465** (Eng 1000-1100) 24433 at 1047 in Oxted; R.Norway Int **7.485** (Norw 1700-1730) 55455 at 1725 in Liverpool; V of Greece, Athens **7.450** (Gr, Eng 1800-2050) 44434 at 1925 in Colyton; V of the Mediterranean, Malta via Russia **7.440** (Eng 2000-2100) 33233 at 2000 in Dudley; V of Israel, Jerusalem **7.510** (Eng 2000-2025) 22222 at 2000 in Truro; R.Budapest, Hungary **7.165** (Eng 2000-2030) 43334 at 2020 in Nottingham; R.Bulgaria, Sofia **7.535** (Eng 2000-2100) SIO 555 at 2041 in Freshwater Bay; R.Romania Int, Bucharest **7.195** (Eng 2100-2156) 33222 at 2100 in Appleby; AIR via Bangalore **7.410** (Hi, Eng 1745-2230) 55544 at 2159 in Northampton; R.Tirana, Albania **7.130** (Alb 2200-2230, Eng 2230-

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener
828	Rotterdam	Holland	20	E,J	1197	Munich(VOA)	Germany	300	E,G
837	Nancy	France	200	E,H*	1197	Virgin via ?	UK	?	E,F,H,I*,L
837	COPE via ?	Spain	?	E,F*	1206	Bordeaux	France	100	E*,I*
846	Rome	Italy	1200	E*,F*,H*,I*,L*	1215	Virgin via ?	UK	?	E,F,H,I*,L,M
855	Berlin	Germany	100	E*	1224	Lehstard	Holland	50	I
855	RNE1 via ?	Spain	?	C*,E*,F*,L*	1224	CDPE via ?	Spain	?	E*
864	Kamo (Foreign Sce)	Armenia	1000	I*	1233	Nitra	Slovakia	40	E*
864	Santah	Egypt	500	E*,I*	1233	Virgin via ?	UK	?	E,H,I,L
864	Paris	France	300	B,E,F,I*,J,L*	1242	Virgin via ?	France	150	E*
864	St.Petersburg(TWR)	Russia	?	E*	1242	Virgin via ?	UK	?	E,H,I
864	Socuellamos(RNE1)	Spain	2	F*	1251	Marcali	Hungary	500	E
873	Frankfurt(AFN)	Germany	150	C*,D,E*,F*,L*	1260	Huisberg	Netherlands	10	E
873	Zaragoza(SER)	Spain	20	C*,E*,F*	1260	SER via ?	Spain	?	F*
873	Enniskillen(R.U)	UK	1	E,H	1260	Guildford (V)	UK	0.5	E
882	COPE via ?	Spain	?	E*,I*	1269	Neumunster(DLF)	Germany	600	E,F*,I*,J,L
882	Washford(BBCWales)UK	UK	100	C,D,E*,F*,L*	1269	COPE via ?	Spain	?	I*
891	Algiers	Algeria	600/300	B*,E*,F*,J*	1278	Strasbourg	France	300	E*
891	Hulsberg	Netherlands	20	E,I	1278	Dublin(Cork/RTÉ2)	Eire	10	C*,D,E*,F*,H*,I*,L*
900	Bmo(CRo2)	Czech Rep.	25	F*	1287	RFE via ?	Czech Rep.	?	E,F*,F*,J*,L*
900	Milan	Italy	600	E*,F*,I*	1287	Lerida(SER)	Spain	10	F*,I*
900	COPE via ?	Spain	?	I*	1296	Drfordness(BBC)	UK	500	D*,E*,H*,I*,L*
909	Lisnagarvey(BBCS)	N.Ireland	10	H	1305	RNE5 via ?	Spain	?	E*,F*,I*
909	B'mans Pk(BBC5)	UK	140	F*,I*,L	1314	Kvitsoy	Norway	1200	B,E,F*,I*,L
918	Domzale	Slovenia	600/100	C*,E*,G*,I*	1323	W'brunn (V.Russia)	Germany	1000/150	B,E*,I*,L
918	Madrid(R.Int)	Spain	20	F*,I*	1332	Rome	Italy	300	E*,F*,I*,L
927	Wolvertem	Belgium	300	E,F,H,I*,J,L	1332	W'brunn (V.Russia)	Germany	1000/150	B,E*,I*,L
936	Bremen	Germany	100	E,F*	1341	Tarrasa(SER)	Spain	2	C*,F*
936	Venezia	Italy	20	F*	1350	Cesvaine/Kuldiga	Latvia	50	E*,F*,I*
936	RNE5 via ?	Spain	?	E*	1359	Madrid(RNE-FS)	Spain	600	E*,I*
945	Toulouse	France	300	E,I*,J	1368	Foxdale(Marx R)	Is of Man	20	D*,E*,H
954	Bmo (Cro2)	Czech Rep.	200	E,F*,I*	1377	Lille	France	300	B,E,F*,I
954	Madrid(CI)	Spain	20	F*,I*	1386	Bolshakovo	Russia	2500	C*,E*,F*,G*,I*,L*
963	Pori	Finland	600	B,E,F*,I*	1395	TWR via Fliake	Albania	500	E*
963	Tir Chonail	Eire	10	H	1395	Lopic	Netherlands	120/40	E,F,H*,J*,L
963	Tunis-Djedaida	Tunisia	200	I*	1404	Brest	France	20	E,F,H*,L*
972	Hamburg(NDR)	Germany	300	E,F*,I*	1413	RNE5 via ?	Spain	?	E*
972	RNE1 via ?	Spain	?	F*,I*	1422	Heusweiler(DLF)	Germany	1200/600	E,F*,I*,L*
981	Algeria	Algeria	600/300	B*,F*,I*	1440	Marnach(RTL)	Luxembourg	1200	C*,E,F*,I*,L*
981	Megara	Greece	200	I*	1440	Damman	Saudi Arabia	1600	E*
981	Berlin	Germany	300	E*,F*,J,L*	1449	Redmoss(BBC)	UK	2	E,H
990	R.Bilbao(SER)	Spain	10	F*,I*	1458	Fliake	Albania	500	I*
990	Redmoss(BBC)	UK	1	E*	1467	Monte Carlo(TWR)	Monaco	1000/400	E*,F*,I*
999	Madrid(COPE)	Spain	50	E*,I*	1476	Wien-Bisamberg	Austria	600	E*,I*
1008	SER via ?	Canaries/Spain ?	?	I*	1485	SER via ?	Spain	?	I*
1008	Flevof(Hiv-5)	Holland	400	E,F*,J,K*,L*	1494	Clermont-Ferrand	France	20	E*,J
1017	Rheinsender(SWF)	Germany	600	E*,F*,H*,I*,L*	1494	St.Petersburg	Russia	1200	E*,F*,G*,I*
1017	RNE5 via ?	Spain	?	F*	1512	Wolvertem	Belgium	300	C*,E,F,G*,J*
1026	SER via ?	Spain	?	C*,F*	1521	Kosical(Cizatec)	Slovakia	600	E*
1035	Lisbon(Prog3)	Portugal	120	E*	1521	Duba	Saudi Arabia	2000	E*
1044	Dresden(MDR)	Germany	20	E*	1530	Vatican R	Italy	150/450	C*,D*,E*,F*,I*,L*
1044	S.Sebastian(SER)	Spain	10	F*,I*	1539	Mainflingen(ERF)	Germany	3500(700)	E*,F*,H*,L*
1053	Talk Sport via ?	UK	?	E*,F*,I*,L,M	1557	Nice	France	300	E,J
1062	Kalundborg	Denmark	250	A*,E*,F*,I*,J,L*	1575	Genova	Italy	50	F*
1071	Riga	Latvia	50	F*	1575	SER via ?	Spain	5	E*,F*
1071	Bilbao(EI)	Spain	5	E*,F*,I*,J,L*	1584	SER via ?	Spain	2	I*
1071	Talk Sport via ?	UK	?	E,I	1593	Holzkirchen(VDA)	Germany	150	E*,F*,I*,L*
1080	SER via ?	Spain	?	E,I	1602	SER via ?	Spain	?	F*,L*
1089	Krasnodar	Russia	300	E*	1602	Vitoria(EI)	Spain	10	E*,F*,L*
1089	Talk Sport via ?	UK	?	E,F,H*,I*,L	1611	Vatican R	Italy	15	D,E*,F*
1098	Nitra(Jarok)	Slovakia	1500	E,F*					
1098	RNE5 via ?	Spain	?	I*					
1107	AFN via ?	Germany	10	E*					
1107	Talk Sport via ?	UK	?	E,F*,I*					
1116	Bari	Italy	150	I*					
1125	La Louviere	Belgium	200	E*,F*					
1125	El Beida	Libya	50	I*					
1125	RNE5 via ?	Spain	?	F*					
1125	Llandindod Wells	UK	1	H,I					
1134	Zadar(Croatian R)	Croatia	600/1200	E*,F*,J,L*					
1134	CDPE via ?	Spain	2	F*,I*					
1143	AFN via ?	Germany	1	E					
1143	Bolshakovo(Mayak)	Russia	150	I*					
1143	COPE via ?	Spain	2	E*,F*,I*					
1161	Ain-Salah	Algeria	5	F*					
1179	Solvesborg	Sweden	600	E*,F*,J*,L*					
1188	Kuurne	Belgium	5	E*,F*,J*,L*					
1188	Reichenbach(MDR)	Germany	5	I					
1188	Szolnok	Hungary	135	F*					

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

- Listeners:-
 (A) Martin Cowin, Kirkby Stephen.
 (B) Simon Hockenhuil, E.Bristol.
 (C) Sheila Hughes, Morden.
 (D) Brian Keyte, Gt.Bookham.
 (E) Eddie McKeown, Newry.
 (F) George Millmore, Wootton IoW.
 (G) Clare Pinder, while in Appleby.
 (H) Tom Smyth, Co.Fermanagh.
 (I) Ernie Strong, Ramsey, Cambs.
 (J) Phil Townsend, E.London.
 (K) Thomas Williams, Truro.
 (L) Fred Wilmshurst, Northampton.
 (M) Tom Winzor, Plymouth.

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2035	C,D
2.325	ABC Tennant Creek	Australia	2035	C,D,P
3.210	REE via Costa Rica	Costa Rica	0300	B,F,K
3.240	TWR Shona	Swaziland	1914	K,L,P
3.255	BBC via Meyerton	S.Africa	1915	B,K,L,P
3.270	Namibian BC,Windhoek	Namibia	1835	B,K,L,P
3.290	Namibian BC,Windhoek	Namibia	1845	B,K,L
3.315	AIR Bhopal	India	0041	B,K,L
3.320	SABC (RSG) Meyerton	S.Africa	1850	B,P
3.325	FRCN Lagos	Nigeria	0603	B,K
3.335	CBS Taipei	Taiwan	1852	L,P
3.345	AIR Jaipur	India	0135	B
3.360	La Voz de Nahuala	Guatemala	0230	F
3.365	GBC R-2	Ghana	2145	B,L
3.909	Yunnan PBS, Kunming	China	1445	M
3.915	BBC via Kranji	Singapore	2110	A,B,G,K,M
3.945	R.Vanuatu	Coral Sea	1900	J
3.950	Qinghai PBS, Xining	China	0043	K
3.955	BBC via Skelton	England	1815	A,B,J,K,Q,R,S
3.965	R.Taipei via Skelton	England	1800	K,N,Q,R
3.965	RFI Paris	France	1907	J,K,S
3.975	R.Budapest	Hungary	2230	A,B,I,J,K,N,P,S
3.980	R.Korea via Skelton	England	2200	A,N,Q,S
3.980	Nexus, Milan	Italy	2300	Q
3.980	R.Teipei via Skelton	UK	1909	J,K
3.985	Nexus, Milan	Italy	1830	A,B,K,Q,R,S
3.995	DW via Julich	Germany	1910	A,B,I,J,K,R,S
4.005	Vatican R.	Italy	0405	K
4.755	R.Educ CP Grande	Brazil	0409	K
4.760	AIR Port Blair	India	0045	B,K,L
4.770	FRCN Kaduna	Nigeria	2108	A,B,D,F,K,L,N,PR
4.783	RTM Bamako	Mali	2110	E,K,L
4.785	Cairari Porto Velho	Brazil	2305	B
4.790	Azad Kashmir R.	Pakistan	0107	A,B,K,L,P
4.800	AIR Hyderabad	India	0150	A
4.800	LNBS Maseru	Lesotho	0304	K
4.805	R.Nac. Amazonas	Brazil	0120	B
4.815	R.Difusora, Londrina	Brazil	0125	B
4.815	R.diff TV Burkina	Ouagadougou	2122	L
4.820	R.Botswana, Gaborone	Botswana	1928	J,K,L,R
4.820	La Voz Evangelica	Honduras	0306	F,K
4.820	AIR Calcutta	India	1805	L,M,PR
4.830	R.Tachira	Venezuela	0130	A,B,K
4.835	ABC-Alice Springs	Australia	2136	L
4.835	R.Tezulutlan, Coban	Guatemala	0135	B
4.835	RTM Bamako	Mali	2007	A,B,C,E,H,I,J,K,L,PR,S
4.840	AIR Bombay	India	0116	A,B,K,L,M,P
4.845	ORTM Nouakchott	Mauritania	2006	E,J,L
4.850	R.Yaounde	Cameroon	2128	B,F,J,K,L,PR,S
4.860	AIR Delhi	India	1919	A,K,L,PR
4.880	AIR Lucknow	India	1419	M
4.885	R.Clube do Para	Brazil	0309	D,F,K
4.885	R. Difusora Acreana	Brazil	0135	B
4.885	KBC East Sce Nairobi	Kenya	1855	K,L
4.890	RFI Paris	via Gabon	0404	A,F,K
4.890	R.Port Moresby	New Guinea	2000	L
4.895	AIR Kurseong	India	0051	K,M

Freq (MHz)	Station	Country	UTC	DXer
4.910	Tennant Creek	Australia	2133	L
4.915	R.Anhanguera	Brazil	0140	B
4.915	GBC-1, Accra	Ghana	2035	A,B,C,H,K,L,P
4.920	R.Quito, Quito	Ecuador	0340	C,F,J,K
4.920	AIR Chennai	India	0052	B,K,L
4.930	R.Internacional	Honduras	0313	K
4.940	AIR Guwahati	India	0053	K
4.945	R.Difusora	Brazil	0155	B
4.950	AIR Srinagar	India	0150	B
4.950	VOA via Sao Tome	Sao Tome	2030	A,B,D,J,K,L,N,PR
4.955	R.Nac. de Colombia	Colombia	0054	F,K
4.960	VOA via Sao Tome	Sao Tome	0315	A,K,S
4.965	Christian Voice	Zambia	1833	P
4.975	R.Uganda, Kampala	Uganda	1940	D,F,J,K,L,PR
4.980	PBS Xinjiang, Urumqi	China	1602	L
4.980	Ecos del Torbes	Venezuela	0055	A,B,E,K,S
4.985	R.Brazil Central	Brazil	2131	B,L
5.005	R.Nacional, Bata	Eq.Guinea	1835	L,P
5.005	R.Nepal, Kathmandu	Nepal	1653	K,L
5.009	R.TV Malagasy	Madagascar	1840	P
5.010	R.Garoua	Cameroon	2250	B
5.010	Guangxi 2, Nanning	China	2147	L
5.010	AIR Thiru-puram	India	0109	A,B
5.025	ABC Katherine	Australia	2134	L
5.025	R.Parakou	Benin	2133	L
5.025	R.Rebelde, Habana	Cuba	0316	B,F,K
5.025	R.Uganda, Kampala	Uganda	2100	K,L
5.030	AWR Latin America	Costa Rica	0317	A,J,K
5.035	R.Educacao Rural	Brazil	0140	B
5.035	R.Bangui	C.Africa	2100	L
5.047	R.Togo, Lome	Togo	2131	B,F,I,K,L
5.050	Haixia 1,V of Strait	China	2128	L
5.050	AIR Aizawl	India	0145	B
5.050	R.Tanzania	Tanzania	1947	J,K,L,S
5.055	RFO Cayenne(Matoury)	French Guiana	0150	B
5.060	PBS Xinjiang, Urumqi	China	0057	A,B,K
5.075	Caracol Bogota	Colombia	0440	A

DXers -

- (A) Michael Casey, NE,Manchester.
- (B) Robert Connolly, Kilkeel.
- (C) David Edwardson, Wallsend.
- (D) Martin Goodey, St.Mary's, IoS.
- (E) Bill Griffith, W.London.
- (F) David Hall, Morpeth.
- (G) Simon Hockenhill, E.Bristol.
- (H) Robert Hughes, Liverpool.
- (I) Sheila Hughes, Morden.
- (J) Rhoderick Illman, Oxted.
- (K) Eddie McKeown, Newry.
- (L) Fred Pallant, Storrington.
- (M) John Parry, Lamaca, Cyprus.
- (N) Clare Pinder, while in Appleby.
- (O) Peter Pollard, Rugby.
- (P) Vic Prier, Colyton.
- (Q) Tom Smyth, Co.Fermanagh.
- (R) Phil Townsend, E.London.
- (S) Fred Wilmshurst, Northampton.

2300) 4444 at 2330 in Morden.

Also mentioned in the reports were the V of Nigeria, Ikorodu 7.255 (Eng to W.Africa), rated 33443 at 2117 in Storrington; R.Prague, Czech Rep 7.345 (Eng to N.America 2230-2257) SIO 544 at 2230 in Co.Fermanagh; R.Yugoslavia 7.130 (Eng to N.America 0200-0230) 54544 at 0205 in E.Bristol; WHRI via Maine, USA 7.580 (Eng to N.America) rated 45455 at 0307 in Manchester; R.Bulgaria, Sofia 7.375 (Eng to N.America 0300-0400) SIO 333 at 0314 in N.Bristol; KTBN via Salt Lake City, USA 7.510 (Eng to N.America 0000-1600) 34333 at 0657 in Morpeth.

Many more broadcasts to Europe may be received in the 6MHz (49m) band. They include R.Japan via Skelton, UK 5.975 (Eng 0600-0700), rated 22222 at 0656 in Rugby; Deutsche Welle (DW) via Julich? 6.140 (Eng Service) 45544 at 1110 in E.Bristol; R.Nederlands via Julich, Germany 6.045 (Eng 1130-1325) 55544 at 1210 in Herstmonceux; R.Prague, Czech Rep. 6.055 (Eng 1230-1257) 54444 at 1241 in Plymouth; R.Polonia [Polish R], Warsaw 6.095 (Eng 1300-1359) 44343 at 1351 in Oxted; R.Yugoslavia, Belgrade 6.100 (Eng 1930-2000) 32223 at 1945 in Stalbridge; Swiss R.Int via Julich, Germany 6.165 (Ger, It, Fr. Eng 1830-2030) 54454 at 2007 in Kirby Stephen; V of Russia 5.940 (Eng 1900-2250) SIO 444 at 2026 in N.Bristol; R.Bulgaria, Sofia 5.845 (Eng 2000-2100) 55544 at 2037 in Northampton; Bayerischer Rundfunk, Germany 6.085 (Ger 24hrs) 33323 at 2042 in Colyton; R.Canada Int via Skelton, UK 5.995 (Fr, Eng 2000-2300) 44444 at 2100 in Dudley; R.Prague, Czech Rep. 5.930 (Eng 2100-2127) 33333 at 2105 in Nottingham; R.Budapest, Hungary 6.025 (Eng 2200-2300) 43333 at 2200 in Appleby; R.Taipei Int via WYFR 5.810 (Eng 2200-2300) 44444 at 2240 in Morden; R.Japan via Skelton, UK 6.155 (Eng 0000-0100) 34444 at 0039 in Manchester.

Those intended for other areas include R.Canada Int via Sackville 5.960 (Fr, Eng to USA, Mexico, Caribbean 2300-0100), rated SIO 433 at 2300 in Co.Fermanagh; ORTM Bamako, Mali 5.995 (Fr 0555-0748, 1757-0000) 23232 at 2330 by Bill Griffith in W.London; R.Ext Espana via Noblejas? 6.055 (Eng to America 0000-0200 Sat/Sun) 54554 at 0100 in Newry; KAIJ Denton, USA 5.810 (Eng to W.USA 0000-1400) 22332 at 0115 in Kilkeel.

READERS' EQUIPMENT

LM&S for \$ February, # March, * April 2000.

- \$ * Robert Beason, Nottingham: JRC NRD-545 + 14m wire or Grundig Yacht Boy 400.
- \$ * Vera Brindley, Woodhall Spa: Roberts R-867 or Sangean ATS-803A + r.w.
- \$ * Michael Casey, Manchester: Roberts RC828 + Howes CTU9 a.t.u. + MFJ d.s.p. filter + 60m & 49m loops in loft.
- \$ * Robert Connolly, Kilkeel: JRC NRD-525 + Timewave DSP+ filter + Datong AD-370 or Sangean ATS-803A.
- \$ * Martin Cowin, Kirby Stephen: Hitachi TRK-5854E or Roberts RB81 + built-in whip.
- \$ * Bernard Curtis, Stalbridge: Realistic DX400 + rod, loop or r.w. in loft.
- \$ * David Edwardson, Wallsend: Trio R-600 + 22m long trap dipole.
- \$ * Stan Evans, Herstmonceux: Kenwood R-2000 + Balun + 11m wire in loft.
- \$ * Martin Goodey, St.Mary's, Isles of Scilly: AOR AR7030 + 25m wire.
- \$ * Bill Griffith, W.London: JRC NRD-535 + 25m wire.
- \$ * Gerald Guest, Dudley: Roberts RC818 + r.w.
- \$ * David Hall, Morpeth: AOR AR7030 + Global AT-2000 + 13m wire.
- \$ * Tony Hall, Freshwater Bay, IoW: Yaesu FRG-7 + 13m wire or RF.845
- \$ * Francis Hearne, N.Bristol: Sharp WQT370 + r.w.
- \$ * Simon Hockenhill, E.Bristol: Roberts R617; R817; R876 or ITT Colt.
- \$ * Richard Howard, Northampton: Grundig 3400, Grundig 400; Sony ICF-7600DS.
- \$ * Robert Hughes, Liverpool: AOR AR7030 + 15m indoor wire or Drake R8E + RF Systems MTA on roof.
- \$ * Sheila Hughes, Morden: Sony ICF-7600DS; Vega 206 + loop; Panasonic DR48 + 15m invert L.
- \$ * Rhoderick Illman, Oxted: Kenwood R-5000 + r.w. or AN-1; Sony ICF-7600DS.
- \$ * Brian Keyte, Gt.Bookham: AOR AR7030 + loop or a.t.u. + r.w.
- \$ * Eddie McKeown, Newry: Tatung TMR 7602; Grundig Yacht Boy 400 or Sangean ATS-B18.
- \$ * George Millmore, Wootton, IoW: Racal RA17L + v.f.i. converter + loop or Sangean ATS-803A + loop.
- \$ * Fred Pallant, Storrington: Trio R-2000 + Howes CTU8 a.t.u. + r.w.
- \$ * John Parry, Lamaca, Cyprus: Realistic DX-394 or Yaesu FT-767 + r.w.
- \$ * Clare Pinder, while in Appleby: JRC NRD-525 + a.t.u. + r.w. or Sony ICF SW55.
- \$ * Peter Pollard, Rugby: Sony ICF-2001D + r.w.
- \$ * Vic Prier, Colyton: Redifon R551N + a.t.u. + r.w. or loop in loft.
- \$ * Philip Roubaut, Macclesfield: Int.Marine Radio R.700M or ITT Mackay Marine Radio 3031 + r.w.
- \$ * Richard Reynolds, Guildford: Sangean ATS-803A + 10m 'T' antenna via a.t.u. or 60m loaded dipole or 11m dipole - all in loft.
- \$ * Harry Richards, Barton-upon-Humber: Grundig Satellit 700 + A0270 or r.w. or Grundig Yacht Boy 400.
- \$ * Alan Roberts, Quebec, Canada: Lowe HF-225 + 49m or 31m dipole or 11m vertical dipole or r.w. Panasonic RF-840 + whip.
- \$ * John Slater, Scalloway, Shetland: Lowe HF-150 + a.t.u. + 20m wire.
- \$ * Tom Smyth, Co.Fermanagh: Sangean ATS-803A or Morphy Richards R191.
- \$ * Ernie Strong, Ramsey (Camps): Yaesu FRG-8800 + Watson Balun or Cirkit a.t.u. + 30m wire.
- \$ * Phil Townsend, London: Lowe HF-225 + preselector + r.w. or loop.
- \$ * Martin Venner, St.Austell: Matsui MR4099 or Yupiteru MVT-7100 + Global AT-1000 + 30m wire.
- \$ * Thomas Williams, Truro: Grundig Yacht Boy 206 or Sharp 5454 + r.w.
- \$ * Fred Wilmshurst, Northampton: Icom IC-R70 + Global AT-1000 + r.w. in loft.
- \$ * Tom Winzor, Plymouth: Kenwood R-2000 + Datong active antenna.



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(includes pre-selector)

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- Flexweave (H/duty)£30.00 P&P £5
- Flexweave H/duty (20 mtrs)£15.95 P&P £5
- Flexweave (PVC coated 20 mtrs)£18.95 P&P £5
- Flexweave (PVC coated 50 mtrs)£40.00 P&P £5

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4 x AAA £6.25 £1 P&P
Rechargeable Alkaline. No memory effects. 1.5V cells. 3 x capacity of nicads. NO QUIBBLE WARRANTY

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MVT-7100EU

Wideband hand-held scanner covers 500kHz-1650MHz. (All mode). Includes nicad/car charger/charger/antenna. Extremely user-friendly hand-held receiver with outstanding performance unmatched by its rivals.

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AR108

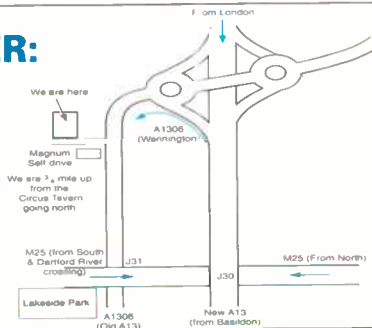
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REALISTIC DX-394



Send SAE for review

★ Superb performance SW receiver ★ 0.2-30MHz (all mode) ★ Selectable tuning steps (down to 100Hz) ★ 240 or 12V ★ Digital S-meter ★ Attenuator ★ Key pad entry ★ 160 memories ★ Clock/timer ★ Noise blanker ★ Limit scan ★ Tape output
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This is a high performance communications receiver providing general coverage reception in CW, SSB, AM and FM modes from 50kHz- 30MHz. Micro processor control of major functions permit ease of operation and features that both new and seasoned short wave listeners will appreciate, at an affordable price.

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The short wave receiver for the true enthusiast.
● 0.03-60MHz (all mode).

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- PC control capability

★★★★ WRTH gave it 4 star rating

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Plus free PSU

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SANGEAN ATS-909



A superb performance portable/base synthesized world receiver with true SSB and 40Hz tuning for ultra clean reception. The same radio is sold under the Roberts name at nearly twice the price. Other features include RDS facility, 306 memories and FM stereo through headphones. The ATS-909 represents superb value for money.

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Optional deluxe stereo/mono headphones for short wave portables.....only £7.99 P&P £2



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The new upgraded basemaps contains much more detail than before. But just wait till you see what you can do with the Garmins map source CD-ROM maps! From these you can upload map section into your GPSIII + fro even more detail and route planning.

ONLY **£329.95**

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★ Typically up to 3Km range dependent upon terrain
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Small frequency counter. Covers 1MHz-2.8GHz. Comes complete with nicad and antenna. Buy one this month and we'll give you a free case worth £15.00.
~~£139.00.~~

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JUMBO WALL/DESK CLOCK.

- Wide screen /2" digit time display
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- Auto RF synch clock from Rugby

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- 12/24hr alarm function
- Auto clock from "Rugby" RF signal
- Alarm function
- Backlight & more
- Incl's batteries

£11.99
P&P £2

SHORT WAVE (continued from page 18)

Table with columns: Time (UTC), Station, Country, Day, Frequency (MHz). Lists radio stations from 1700-1800 to 1930-2000.

Table with columns: Time (UTC), Station, Country, Day, Frequency (MHz). Lists radio stations from 1930-2000 to 2100-2159.

Table with columns: Time (UTC), Station, Country, Day, Frequency (MHz). Lists radio stations from 2100-2159 to 2315-2320.



MEDIUM WAVE

Table with columns: Time (UTC), Station, Country, Day, Frequency (MHz). Lists radio stations from 0900-0930 to 1230-1300.

Table with columns: Time (UTC), Station, Country, Day, Frequency (MHz). Lists radio stations from 1400-1500 to 1900-2000.

Table with columns: Time (UTC), Station, Country, Day, Frequency (MHz). Lists radio stations from 2000-2030 to 2315-2345.



■ ANDY CADIER, 28 ROMNEY AVENUE, FOLKESTONE, KENT CT20 3QJ

Off The Record

Well here we are, safe on the other side of the millennium bug zero hour with absolutely no catastrophes to report. Radio adverts for a local hardware store were adding to the hype by offering anything from paraffin lamps to petrol generators "Because you never know what will happen!" Anyway I did not even succumb to the temptation to get myself some water purification tablets. Even my almost vintage video recorder has coped with the year 2000 without undue difficulties.

Radio Frequency Review

The chances of a full time local radio station for Thames-side has moved a step closer thanks to a review of the f.m. radio dial which has been commissioned by the Secretary of State for Culture Media and Sport, Chris Smith. Local RSL station 'The River' are being denied the opportunity to become a full time station because the lack of f.m. frequencies in the area. The Spectrum Review should be publishing their report for this area later this month.

The way in which BBC and commercial radio have expanded into the f.m. band in recent years, with different blocks for frequencies being allocated different types of station, has clearly led to an inefficient use of the radio spectrum. Perhaps this and similar reviews over the country, particularly in the heavily populated areas, would free up some additional frequencies for local and community radio.

Offshore Radio

The proposed new Radio Luxembourg on 208m, 1440kHz, mentioned last quarter, has not materialised. I am told that the project is suspended rather than being abandoned.

Another revival, this time Radio North Sea International, which should be on air this month commencing transmissions on 11 April on 1566kHz, from a mooring at Harwich, Essex. This is a continuation of the previous RSL and is based on the same light vessel, number 18 (known as the *Mebo 3*) as last August's transmission.

Station Manager, Paul Graham, says this broadcast is to help raise funds for the 4th Dovercourt Sea Scouts who are in need of £165,000 towards a new building in Barrack Lane, Dovercourt. A spokesman for the sea scouts says that it will give their members hands-on experience at working on a large ship and sharing in the duties aboard.

Provision will be made for visitors to reach the vessel, which will be in calm sheltered waters. In contrast to the previous RSL's mooring off Clacton, where a 1st class certificate in deep sea diving and an empty stomach were the essential requirements for getting aboard.

Apart from the m.w. output, the station should also be available on the Internet and on the short wave frequency of 7.415MHz via WBCQ in the USA. Further details are available on the RNI info line on (09003) 404070, calls are charged at 60p per minute at all times.

Another ex-lightship that had been used for broadcasting to Israel, renamed the King David, was briefly used for Channel 2000. This service now operates from land, but the ship has been at sea but completely idle for several years with just a caretaker aboard. It has become increasingly dilapidated and unsurprisingly the winter weather caused the ship to drift ashore causing its spectacular mast to collapse into the sea. This is probably the end of one of the most misconceived offshore radio pirates to have ever (barely) existed.

Caroline Grounded

During Christmas Eve's gales the Radio Caroline ship *Ross Revenge* had a mooring chain break causing them to become grounded on a sandbank again! Their plight was observed by another vessel and the Medway Port Authority informed.

Two tugs - the *Lady Morag* and *Lady Brenda* - managed to secure lines to the *Ross* and tow her to safety. Despite the force 10 gale no damage was done to the *Ross Revenge* or any other ship.

Radio Caroline are broadcasting on satellite an appeal for funds to cover the costs of recovering their ship which is likely to

be very expensive. At the time of writing this account had still not been received by the Caroline management, who so far had only been charged about £150 for pilot's fees for navigating the ship back to its former mooring off Queenborough at Sheppey.

You can get further information about Radio Caroline from their premium rate phone line, 39p per minute cheap rate and 49p at all other times, (0906) 7669 990. This service is regularly updated by Peter Moore, their Station Manager.

A Pirate King

As summer is coming I don't really want to dwell too much over the Millennium Holiday, but for those that tuned into the s.w. pirates it was a splendid occasion. Reception on most frequencies was good and so was the programming, with some stations making a considerable effort to entertain their listeners.

Looking at my logbook and those sent in by readers, Radio Free London appear to have hit the jackpot with at least four s.w. frequencies operating most of the time, with some carrying an alternative programme, plus 819 m.w.

Listeners' Logs

Wayne Dooley listening and writing from Torquay in Devon says he has recently taken up tuning into m.w. and s.w. broadcasts on his Sony IFC-SW7600. He says he likes the frequency charts in Brain Oddy's 'LM&S' pages and readers logs on this page.

I will explain that some years ago I did produce pirate s.w. charts identical to Brian's in order to create some uniformity within the magazine. Eventually the Radiocommunications Agency took exception to this under the 1990 Broadcasting Act which prohibits publicising unlicensed stations. Since then I have continued to report on pirate activity, but made great effort not to produce anything that could be construed to be some sort of *Pirate Radio Times*.

Wayne has heard the religious station Nexus on 3.985MHz in Milan. This station is legal, uses about 10kW and relays all kinds of stations, including many regarded as pirates. They simply send a recording plus the transmission fee, some reference books show this as IRRS, Italian Radio Relay Service.

Other stations heard by Wayne in this band include Laser Hot Hits and Radio Free London. Moving to the 6.2 to 6.3MHz band he lists Pipline International, Laser, Station Sierra, RFL Gold, Borderhunter, Outreach and Pandora.

Now to Steve Black of Hoddesdon, Hertfordshire, he too has been scouring the s.w. band for pirates, Subterranean Sounds, Ozone Radio, Radio Free London, Radio Pandora, Radio Waves, Weekend Music Radio and (u.s.b.) Radio Flamingo all heard.

Pirates For Peace

This is a project mounted by the charitable organisation Action For Peoples In Conflict. Their object is to encourage and facilitate the development of cross border and cross denominational community relations in Northern Ireland. This also includes teaching young people communication and broadcasting skills.

Pirates For Peace intend to use an ex-naval minesweeper as a mobile production studio and a young people's radio station, which will eventually be moored at Carlingford Lough, but would have the ability to move to other coastal areas of Ireland.

Their publicity says "The link with pirate radio of the 1960s is a significant one which captures the spirit of the project". Their vessel is now called *Enterprise* and is moored at Southampton, it will gradually be fitted out to become a floating radio station.

Negotiations are to take place with the Radio Authority regarding licensing and they also hope to get some of their productions broadcast by existing radio stations. Their forecasted costs for this year amount to about £85,000. More information is available on their web site at

www.oneworld.org/afpic/pirates.html or you can ring Shivaji Shiva on (01235) 519393 or E-mail: shivers@afpic.freeserve.co.uk



Radio Nostalgia

The SWM E-mail readers list has been packed with bygone radio memories, also the BBC have been in on the act with the BBC Radio 4 programme called *The First Pirate*. This traced the history of Radio Normandy and its founder Captain Leonard Plugge and his International Broadcasting Company.

Sadly little evidence still exists of this pioneering era of commercial radio, their studios at Fécamp have long since been demolished. BBC Radio 2 have also broadcast the history of Radio Luxembourg, originally another so-called pirate from the 1930s. Radio Luxembourg's English Service achieved even greater notoriety after the war when it became Britain's only commercial radio station, even though it was based abroad.

Pirates Hijack Listeners

Some f.m. radio pirates are reported to be constantly transmitting RDS flags, as used for news or traffic and travel reports, so that travellers with their RDS switched on to this mode find themselves unwittingly tuned to an unauthorised station. The Radiocommunications Agency are reported to be looking into the problem.

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Icom have launched a new scanner with a built-in TV receiver. So when there is nothing to listen to, you can watch the pictures. You will need to be in a good signal area to get best results.

- * NSTC/PAL TV Receive.
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- * Memory: Extensive Storage.
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- * Dual Receive.
- * AC charger and batteries included.

£59.99



UBC - 220XLT Handheld Scanner

£119.95

Ideal for general listening, this scanner covers all the major bands from 66MHz - 956MHz AM and FM. 200 memories and a very fast scanning speed make this a very attractive buy. You also get the flexible short antenna, AC charger and batteries. Very popular with Airband listeners.

UBC-3000XLT 25MHz - 1.3GHz

It has 400 channel memories. Automatic store and automatic sorting. Ultra fast scan rate. LCD backlight. 300ch per sec. scan rate. Data skip function. Supplied with AC adapter/charger and AA ni-cads.

£199.95



Yaesu's New VR-500 100KHz - 1300MHz

A true all-mode scanner offering great performance on VHF and UHF as well as the short wave bands with SSB coverage. 1000 memories, alphanumeric display, band scope, and PC programmable option.

Phone



ATS-818 Short -Wave Portable

SSB AM & Broadcast

A compact portable station that will pull in signals from around the world. SSB reception will let you hear radio amateurs and aircraft from the far corners of the world. There are 54 memories in which to store your favourite stations. Power is via 6 AA cells (not supplied).

£129.95



Super Searcher Auto Tunes Your Receiver

£99.95

This frequency counter covers 10MHz - 3GHz and has the added ability to auto tune receivers with data ports. It will work with AOR 8200 and IC-R10 models. As soon as it finds a signal it tunes the receiver in a flash. Can also be used as a stand-alone unit. Supplied with ni-cads, charger and antenna.

Hunter Frequency Counter

£59.95



Super Value

This is one of our most popular counters - and rightly so at the price! Supplied with rechargeable battery pack, AC charger and telescopic antenna. It has a range of several hundred feet (for handhelds) and sniffs out any local transmission, displaying the exact frequency. You then simply key that frequency into your scanner.

FC-130 Frequency Counter 1MHz - 3GHz

£79.95

This frequency counter functions in a similar way to the "Hunter" above. However, it offers a wider frequency range down to 1MHz and has a 10 digit display. It also offers a 16 digit bargraph field strength meter. Supplied with ni-cad pack, AC charger and antenna.



AOR-5000 Receiver 10kHz - 2.6GHz

£1395



Covering an extremely wide frequency range and offering USB, LSB, CW, AM, FM. It features 1,000 Alphanumeric Memories * 45 Channels per sec Scan Speed * 2,100 programmable Pass Frequencies * DTMF Decoder * RS-232 Port * 1Hz tuning steps * 6 switchable bandwidths * Preampifier * Duplex monitoring *

ICOM ICR-8500 Receiver 100kHz - 1.99GHz

£1395



Icom's wide range receiver has all the performance and engineering qualities you expect from this company. Features include USB, LSB, CW, AM, FM, WFM * Wide dynamic range * RS-232C interface * 1000 alphanumeric memory channels * Comprehensive scanning * Sleep function and Timer * IF Shift control * 3 Antenna connectors * Voice synthesizer option * Keypad frequency entry * Analogue S-meter * Large LCD read-out etc. Send for brochure.

AOR-3000A Receiver 100kHz - 2036MHz

£699



The AOR-3000A goes on and on. It offers a wide frequency range at a very competitive price. Features include USB, LSB, CW, AM, FM * Fast 50 channels per sec search, * GaAsFET RF amplifier * Wide range of tuning steps from 50Hz * RS-232 port * 400 memory channels * Built-in clock * Channel pass feature * Back illumination * Rear whip antenna etc. Ask for leaflet.

NASA HF-4E Receiver 30kHz - 30MHz

Computer Compatible FREE Software Disk

NEW

This new receiver covers 30kHz to 30MHz and is designed for SSB, CW and AM reception. A much improved version of the Target HF-3, it is fitted with 2.6kHz SSB filter, advanced mixer design, backlit display, active noise antenna facility, and computer output. Included in the package is a software disk and 12V AC mains adapter. **Optional self-powered active antenna £59.95**

£199



ICOM IC-R75 Receiver 30kHz - 60MHz

FREE AC PSU & DSP Unit

NEW

The IC-R75 has received rave reviews in the Amateur Radio Press. It's a very serious short wave receiver with coverage right up to the exciting 6m Ham Band. Features include USB, LSB, CW, AM, FM * 101 Memories * Super High Dynamic Range * Synchronous AM detection * Twin Pass Band Tuning * Digital Signal Processing * Automatic Notch Filter * 101 Alphanumeric Memories * RF Gain/Squelch * Clock * Numeric keypad * Attenuator * 2-level Pre-Amp * Scanning.

£629



YAESU

FRG-100 Receiver 50kHz - 30MHz

£389



The FRG-100 has stood the test of time. It offers full coverage of the short wave bands plus long wave and medium wave. It features, * USB, LSB, AM, CW, * 50 memories * 2 stage attenuator * Noise Blanker * Band Scanning * Memory Scanning * Dual Speed AGC * High and low impedance antenna inputs * Programmable steps from 10Hz - 1kHz * Optional Narrow Filters, PSU and FM board * BFO reverse for CW * Twin Clocks. Ask for leaflet.

AOR-7030 Receiver 0kHz - 32MHz



Needing little introduction, this receiver has become a classic of design. Features USB, LSB, CW, AM, FM, * 100 Memories * Dual VFOs * Resolution to 10Hz * Clock and Timer * Variable Bandwidth * Wide Dynamic Range * Seamless Tuning using Single Loop DDS * Clear LCD Readout * Infrared Remote Controller * AC Power Supply. Send for leaflet.

Phone

Fairhaven RD-500VX 20kHz - 1.75GHz



This very wide range receiver offers a complete listener station in one package. Features include USB, LSB, CW, AM, FM, Video out * 5Hz step accuracy * Over 13,000 memories with 20 Alphanumeric Characters * Noise Blanker * Text Search * Pass Band Tuning * Stereo CW Reception * Notch & Peak Filter etc.

Phone

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Yupiteru MVT-9000EU Mk2
 100kHz - 1.99GHz

Latest Mk2 Version

Phone

Here's your chance to purchase the latest scanning receiver from Yupiteru at an unbelievable price. Covering the complete radio spectrum from long wave to UHF, you have a complete station in your pocket. Features include NFM, WFM, NAM, WAM, LSB, USB, CW, * 7 Frequency steps * 1,000 Memories in 20 banks * 500 Pass memories * 10 Priority channels, * Band Scope display * Duplex receive function lets you hear both sides of the conversation * Fast tune function, * Built-in AM antenna * Dual frequency display * Fast keypad entry. * Rechargeable batteries. AC charger and helical antenna.



Phone

Yupiteru MVT-7100EU
 100kHz - 1.65GHz

Probably the best value for money, it has stood the test of time and is very sensitive. Offers USB, LSB, CW, AM, FM, WFM, * 1,000 memories * 500 Pass channels * 12 Tuning steps * Fast scan speed * Rechargeable batteries. AC charger and telescopic antenna.



£179

Yupiteru MVT-7000EX
 100kHz - 1.3GHz

The ideal scanner for those who are mainly interested in VHF and UHF listening. Features include, FM, WFM, AM reception * 200 memories in 10 banks * 20 steps per sec scanning * 6 Tuning steps * Good sensitivity * Supplied with rechargeable ni-cads and AC charger. Telescopic antenna included.



Phone

AOR-8200
 500kHz - 2040MHz

This wide range scanner is fitted with a data port for computer control. Features include USB, LSB, CW, FM, WFM * Programmable steps * 1000 memories in 20 banks * Alphanumeric display * Built-in AM antenna * 8.33kHz steps for air band * Rechargeable ni-cads. AC charger and helical antenna.



IC-R10E
 500kHz - 1300MHz

USB, LSB, CW, AM, FM, WFM * 1,000 Memories * Bandscope * Noise Blanker * Wide range of tuning steps * alphanumeric Display * Real Time Band Scope * Voice scan feature * Data output port * Programmable scanning * Ni-cad pack. AC charger and helical antenna.



£249

IC-R2
 500kHz - 1309MHz

This palm size handy offers great performance. Offers FM, WFM and AM * Auto squelch * 400 Memories * 11 Tuning steps * CTCSS decode * Duplex monitoring feature * PC Programmable * Built-in attenuator * Priority watch * Needs 2 x AA cells (extra). Antenna included.



£129

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Nothing Else Comes Close!



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Control your radio from your PC. With virtual receiver (illustrated) your handheld becomes a base station receiver. Supports all data port receivers from AOR, Icom, Yaesu, Kenwood and some Bearcat. And you get the following exciting features.

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- * Access import
- * Voice recording (WE version only)

The latest version of this software is now available for immediate shipment.

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Double Your Life!! NiMH Cells

These Nexcell Ni-MH cells have around twice the capacity of ni-cads and no memory effect. The AA size are 1350mAh. Ideal for handhelds and digital cameras. As supplied to the police.

- 4 x AA cells £9.95
- 4 x AAA cells £9.95
- Charger for above £9.95
- Carriage £2 maximum. Quantity discounts - phone.

PCR-1000 Computer controlled Receiver

Mode: USB, LSB, CW, 10kHz - 1300MHz
 AM, FM, WFM.

Connect this up to your PC and enjoy high quality reception with an amazing station data base and memory log. Can be used remotely from PC. Requires PC not included.



£279.95

LAPTOP COMPATIBLE

Hoka Gold-3 Decoding Software



THE SECRET'S OUT!

We are now the UK distributors. As used by governments, it can decode just about any form of data transmission on HF and VHF. Simply connect between PC and Rx audio. Can be loaded on any number of PCs. This is very advanced programme. £349.95

WMM-1 Data Decoder
 Multimode Data Modem



£69.95

This modem is connected between PC serial socket and radios audio socket. It is self powered. Supplied with software, it will decode data signals on your PC including Packet, AMTOR, SSTV, Fax, RTTY, CW, NAVTEX, SYNOP. Now you can read those strange noises!

FB1 - 9 Skin Coloured Earpiece

£0.95

The FB1-9 is a brand new design that is skin coloured to make it far less obvious when worn. The cable and cable exits will take a strain of * 2kg so it won't break in commercial applications.



W-LWB MkII Long Wire Balun



Just attach any length of wire and feed back to radio with coax cable. Reduces interference and improves matching to receiver. £22.95

AT-100 Active Antenna

Intended for indoor use, the unit has a telescopic antenna. Dramatically improves reception. Adjust controls for maximum signal. Powered by internal 9V cell or external supply. £79.95



Ant-60 Wire antenna



This 7m long shortwave antenna coils up like a tape measure. Pull it out and attach the input end to your receiver socket or whip antenna. Idea for portable or vacation use. £14.95

WS-Mobile Antenna

WS-Desktop



The answer to those who want to improve the scanner performance using an indoor antenna. Covers 25 - 1300MHz and includes coax cable terminated with BNC plug. £49.95



Just 0.9m high with magnetic base and 4m cable terminated with BNC plug. Covers 25 - 1300MHz and is the ideal choice for scanner users. £49.95

SWL DX-1 HF Ant.



Covers 1.5 - 30MHz and is 50m long. With 10m feeder wire back to receiver. An ideal general purpose antenna. £

AT-2000-02-21

The classic wire antenna tuner for short wave listening. Covering 1.8 - 30MHz, it includes our exclusive Q-switch, which improves front-end selectivity. Just connect a random length of wire and connect a coax cable from ATU back to receiver. £89.95



Angler HF/UHF Antenna



Ideal for scanners, this antenna is 14m long and covers the range 100kHz - 1300MHz. It includes coax cable terminated with BNC plug. £19.95

QS-300 Desk Stand

Designed for all handheld scanners. Your scanner sits on the adjustable holder and a short BNC cable runs to an SO-239 socket, ready for you to plug your external antenna into. A really smart device. £13.95



WS-Base Disconnector



The classic antenna covering 25MHz to 1300MHz. Ideal for all scanners. Height is 1.2m. Just connect coax cable to the SO-239 socket. Suitable for indoor or outdoor use. £49.95

A-50 Active Antenna

This short wire can be hung from any convenient point and covers 30kHz to 60MHz. It offers a range of up to 10dB and is powered from 12 0 15V DC supply. £79.95



How To Ruin Another Perfectly Good Receiver

Bob Ellis
reminisces as
only Bob can!

There was a time when if enough people were gathered in one place at any one time and conversation could be steered to radio, then there he would be - the closet World Service listener. No sexism here - the listener would be male and sadly for readers of *SWM*, he won't have been listening on short wave. He will have come in off a shift, come in from the pub or stumbled back from a party only to find his beloved Radio 4 I.w. has closed, opting over to Play of the Week on the World Service. As I write this, those going over to Sky Digital will have lost the audio sub-carriers that re-introduced telly folk to radio.

For my generation, there were still warehouses full of ex-military kit looking for homes and all of us were experts in its restoration. If you read what I did to my AR88 in these pages, you will know that an *ex* is something that was and a *spurt* is a drip under pressure. Blaster Bates' definition of an expert is not far from the truth...

Real Wage

The first real wage packet, all £8 of it, was blown on this solid little set affectionately known as The Cube. The shop was a weird place on Curzon Street in Derby, hoping to make



... the sinister glow ...

a living out of militaria. It's now a wine bar.

Known better as a Collins TCS-12, mine had no power supply. As a child, my p.s.u.s always doubled as room heaters. Looking at the circuit now, it was capable of 80mA of h.t. max., running a 12A6 in the local oscillator - a power beam-tetrode - with something similar biased for Everything Forward and Trust In The Lord in the audio output stage, that 80mA was easily exceeded.

The mains transformer gently fried. They say the sense of smell is the most evocative for memory. I think of the TCS every time they resurface the roads.

The Local Oscillator was meant to be a power-oscillator. It radiated a very clean heterodyne across two villages. Local it wasn't.

Replacing all the capacitors for The Liquorice Allsort Series, our name for polyester types borrowed on long-term lease from work, no doubt made it better. I know I would have jacked up the screen volts for each valve whilst changing all the resistors.

Here I learned about 'preferred values'. Well, I liked them...whether it needed this mod is moot point. The caps were paper-block and the resistors solid carbon. Collins never used a half-watt if you could get a 3W in. Restorers

insist you change all these. So I did.

At least with the incredible I.o. injection, you could use the longest of long-wires and still get a clean mix. Inexperienced ears don't know what a 3rd-order product sounds like. Today, new listeners have every noise they don't like down to a 'design fault'.

Back then, the TCS radiated better than some not-so-QRP rigs. Of the three gangs in the tuning, the oscillator was the biggest. Why? Not sure, but could have something to do with linearity.

Condemned As Useless

On the Military Wireless Net (Saturday, around 1000 on 3.625 a.m. - that's amplitude modulation, please note) the TCS was condemned as useless due to broad selectivity. At 12kHz, it made solid-carrier broadcast listening a real pleasure. The *Two Bobs* on Swiss Radio International was a joy to listen to. Up in my room, this was all the contact I had with Real Radio and I miss them. World Service was on 5.975 during the day making The Cube a real favourite.

It grew a Carrier Meter, a naff loudspeaker first in the top of the case then on the front panel using a classic chrome trim nicked off an AIRMEC signal generator. The case was sprayed the inevitable FARINA GREY 9095, cans of it. It grew product detectors, infinite-impedance detectors and current-hungry audio stages.

The 600Ω output defeated me, so this was RC coupled to an EL95 on the panel that held my mains transformer mods. This, in turn, had replaced a rack of ceramic sockets for crystal operation at the back of the case. Unable to think of another mod and suitably ruined, I gave the TCS away. I wanted an HRO.

Great Receivers

Seeing these great receivers again on Channel Four's series on Station X reminds me to be a Radio Man in the Sixties meant getting an HRO. It had UX series valves leading up to a 43 in the output stage. You changed bands by changing the entire coilpack. Switch off B+ (the h.t.) before changing coils or the shock threw you across the room. There were nine coilpacks

in a wooden rack - very collectible.

Opening the lid of an HRO took you into a world of wonder. The tuning knob ran a scale up to 500 - but you never saw the numbers change. The transverse-mounted tuning gang with the signal circuits regimented in a straight line. The sinister glow of the 'S'-meter, the scale discoloured by the passing years.

It was so quiet. It seemed the signal-to-noise ratio consisted only of signal. Working with the graph on the front of each coil-pack, you spun the dial to be, give or take parallax error, indifference to chart-reading, rounding up or down the scale setting, ±100Kcs (*ah, we'll forgive him - guess you can't use rose tinted glasses and modern units at the same time? - Ed.*) of where you wanted to be. Then you just listen around.

Bandspread coils were wonderful. Top Band covered in about thirty turns of that magnificent tuning drive. It took about six to get through Loran. Tuning a.m. was a challenge. The slow tuning rate and the broad flat-topped i.f. response resulted in the ballistically-challenged 'S'-meter hardly showing a peak. Happy times!

These days they tell me a modern home hasn't the space to accommodate a military set. As I write this on a PC, the thought strikes me. It takes up about the same room as an RA17... *SWM*

Revealing a Remarkable Receiver



Icom are proud to announce their latest radio receiver - the IC-R75. This dedicated HF+50 MHz, all-mode unit has frequency coverage stretching from 30kHz to 60MHz in USB, LSB, CW, RTTY, AM, FM and S-AM. In addition to an extremely sensitive receiver, the twin PBT, 2-level pre-amp, selectable Auto-Gain Control (AGC) and noise blanker help to capture and clean up DX signals, whilst the RF attenuator reduces interference from strong local stations. The IC-R75 also has a Synchronous AM detection circuit to prevent audio distortion while receiving AM broadcasts.

A comprehensive range of features can be found in this extremely compact radio, measuring only 241(W) x 94(H) x 229(D) mm. These small dimensions give complete installation flexibility however you choose to operate, as a base or mobile.

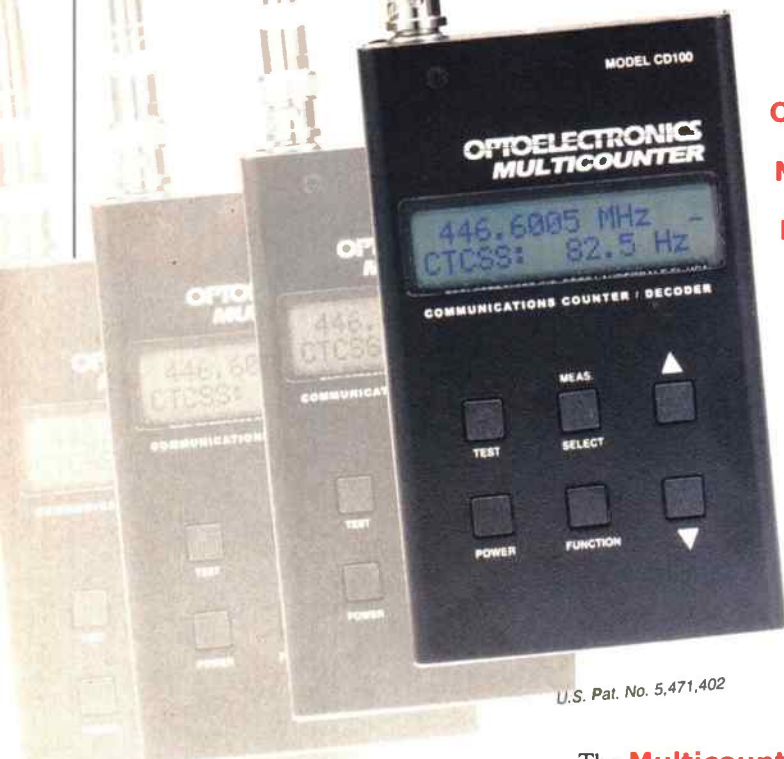
The user-friendly front panel has a large, clear, alphanumeric LCD display. This shows the frequency or '6+2' character channel name. The panel also has a numeric keypad to allow direct frequency entry or memory channel selection. The SQL control may also be configured to adjust RF gain and/or squelch threshold. The large, front-mounted speaker provides clear audio, even at the maximum level of 2 watts.

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Commercially Speaking

I'm suffering, if that is the right term to use, from an embarrassment of riches. Having had the opportunity to get to grips with a recent Collins receiver, I was astonished to be presented with yet another professional rack mounted beauty in the shape of a Harris RF-590A (no, I'd never heard of it either). Taking the dates on the respective service manuals for the Collins HF-2050 and the Harris RF-590A, the Collins pre-dates the RF-590A by some seven years, but Harris retain the use of traditional i.f. crystal filters whilst, as you all know, the HF-2050 used d.s.p. for filtering and demodulation.

An interesting session was about to begin as I set about this pleasurable task. I

have here a confession to make, because on checking my recorded data for the HF-2050 I found that I had made a silly mistake in the calculation of third order intercept point, which makes the true level +23dBm instead of the +28dBm I gave in the review. Following this discovery I asked myself the question (on your behalf) "What is it that makes a really great receiver for the keen listening user?" and I will probably write further on this in a future issue (Editor's grace and favour willing).

The Harris RF-590A is again built to the seemingly common standard for these receivers, in that the front panel occupies a 3U x 19in panel (for those not familiar with this long established designation, the 'U' is a unit of 1.75 inches, so the panel height is 5.25 inches). This is one standard which cannot be changed to metric units, much to the relief of my imperial mind. The panel carries two displays, one showing frequency to eight digits, i.e. readout to 1Hz, together with memory channel number, whilst the other display covers the various receiver operating conditions; a.g.c. speed, Mode, Bandwidth, Dwell time, Memory group and b.f.o. offset. The display devices are green fluorescent tubes reminiscent of the Trio R-1000, but with much larger digits, and are easily readable despite the presence of a semi transparent plastic protective window. Alongside the left hand display is an analogue moving coil meter which can be switched to display r.f. level and audio levels in the independent sideband channels. Below the displays is a row of non latching push buttons related to the displays, with each button function clearly labelled and having a single function - no menus to dig through to find anything.

Below again is the main tuning knob flanked by a numeric keypad on one side and a row of

secondary push buttons on the other, none of which has a dual function. To complete the line-up there are three conventional rotary controls for a.f. gain, r.f. gain and Squelch. The rear panel is neat and tidy with the usual terminal strip for connection of 600Ω line audio, a.g.c. lines, extended local control and a separate connector for remote control facilities. BNC connectors allow use of the internal frequency

standard for driving other equipment, connection of an external frequency standard and access to both filtered and unfiltered i.f. outputs at 455kHz.

The RF-590A is quite a beast to swing on to a test bench, being some twenty inches deep and weighing in at 40 pounds (18kg for you Europeans), but

of course Harris have packed in a lot of receiver, and the weight is explained when you take off the covers to reveal a solid phalanx of individually screened compartments top and bottom. Each box is clearly labelled, and no obvious connectors are present apart from a wedge of ribbon cables to the front panel assembly, so maintenance (should it ever be required in a receiver like this) has obviously been well thought out. Fault finding is helped by built-in test routines which are exercised each time the receiver is switched on, and can be called up at any time by pressing the 'TEST' button on the front panel. The list of tests called is very comprehensive and runs from a test of every segment of every display to several tests on each receiver stage from antenna to audio output, including a.g.c. time constants, signal to noise ratio, levels throughout the receiver and even the operation of FSK firmware. Amazing. Several key tests are run

John's back with another 'classic' commercial receiver to make you drool. This month JW has the Harris RF-590A under the microscope.



continuously all the time the receiver is switched on, which is rather like having a friendly service engineer sitting alongside you when you are using the unit. To simulate a fault I disconnected the synthesiser drive to the first mixer by pulling off the coaxial connector into the r.f. box and sure enough the receiver display showed 'Fault Unit A2', together with a fault code to indicate what test had failed. As an engineer I loved it.

The r.f. architecture of the RF-590A is conventional enough, with signals in the range 10kHz to 30MHz being connected to the first mixer after passing through a six section low pass filter with a rapid drop off to a stop band attenuation of 100dB beyond 30MHz. The input is designed to withstand application of anything up to 100W of r.f., protection being very positive, using a double pole relay to completely disconnect the feed from the antenna to the low pass filter under overload conditions. The first mixer, where the signal is converted to the first i.f. of 40.455MHz, is a

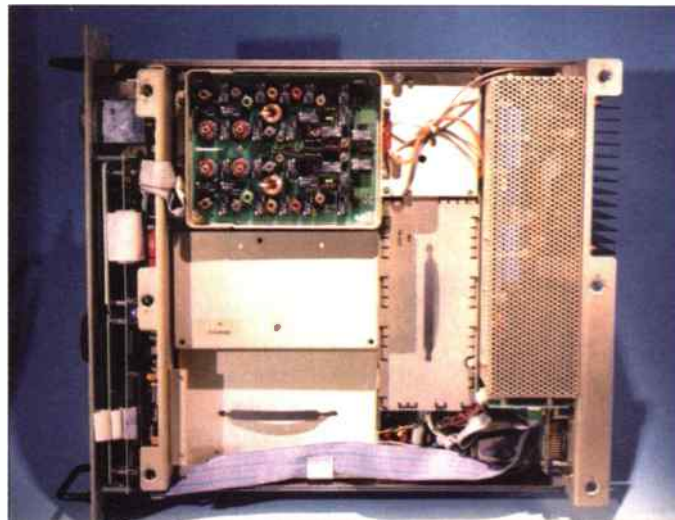
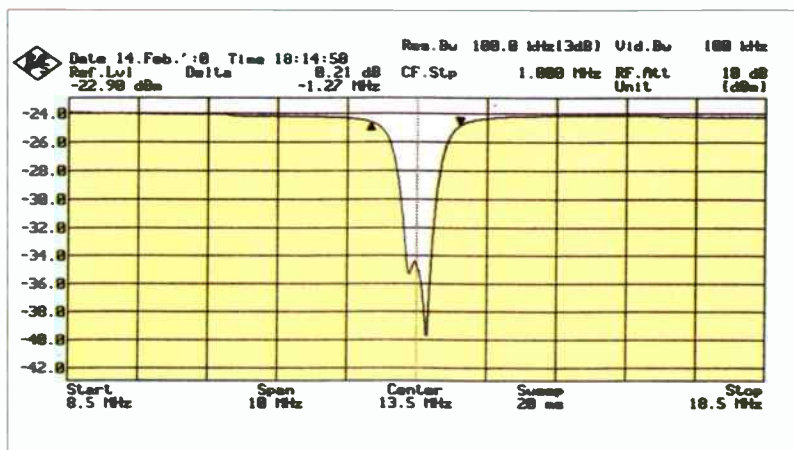


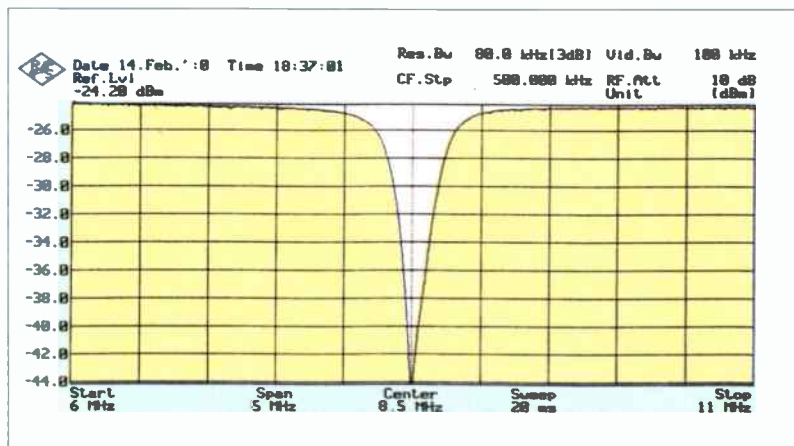
Fig. 1: RF-590A return loss at 13.5MHz.



packaged high level device, using a local oscillator drive of +23dBm, and with r.f. and oscillator inputs fed through 3dB matching pads to ensure proper mixer balance. The local oscillator tunes from 40.465 to 70.455MHz to give an i.f. of 40.455MHz with an antenna signal ranges of 10kHz to 30MHz.

The first mixer is followed by a 12dB first i.f. amplifier employing grounded gate f.e.t.s, and

Fig. 2: RF-590A return loss at 8.5MHz.



having r.f. a.g.c. control applied at the amplifier output. Before the i.f. passes through a 40.455MHz roofing filter with a bandwidth of 16kHz. It's an interesting comparison to look back at the Collins HF-2050 receiver in which the designers had applied r.f. a.g.c. to the input of the first mixer itself, and I commented on this unusual practice in last month's review. Still at 40.455MHz the i.f. signal is passed to the second mixer, but is first treated to a dose of further filtering in the shape of two single crystal filters tuned to provide notches at 39.543 and 39.547MHz - why?; because with an i.f. of 40.455kHz and a conversion oscillator of 40MHz to give the final i.f. at 455kHz, there is an image 910kHz away from the wanted i.f., nominally at 39.545MHz and the use of these two single crystal notches 4kHz apart combine to effectively remove the unwanted response in a 4kHz bandwidth before the i.f. hits the second mixer. This is another double balanced diode ring with the 40MHz local oscillator being fed in at +7dBm, the mixer being followed by a simple pi-section low pass filter before the 455kHz i.f. is fed out to the main i.f. filter board.

Classic Road

Oh Joy Unbounded; when I took off the top cover from the 455kHz filter unit I was presented with a row of superb looking crystal filters, so it's interesting that Harris chose to go down the classic filter road rather than the d.s.p. muddy track. Bear in mind that if you take a look at the Harris Web site you will find that the RF-590A is a current product, so we are not dealing with 'old' equipment here. The use of filters must have been a conscious design decision because the cost of providing d.s.p. is probably lower than using high specification filters - and these are, take it from me, high specification filters. The receiver I tested was equipped with five out of the seven possible filter options, and since the i.s.b. option was fitted, two of the filters were the matched u.s.b. and l.s.b. pair. In addition I had the 300Hz, 1kHz and 6kHz filters so it was a good all round set. 455kHz i.f. amplification is fairly conventional, and the various demodulators are all non-digital devices. The a.g.c. system is very comprehensive, with short attack (20ms or 10ms) with decay time (actually hold time, since the a.g.c. is a true 'hang' type) selected from the front panel.

I never did find the noise blanker described anywhere in the otherwise impressive manual, so I went hunting for it by starting on the circuit at the 'NB' switch and ploughing through the main chassis interconnection drawing until I chased it into the preselector box. The preselector is an option

module, and the circuit was not included in the manual, so I still don't know how, or if, it worked. Everything else did work supremely well, so on to the moment of switching on and using.

On went the mains, up came the "Test" display and after about five seconds the RF-590A sprang into action. The display is very easy to read, and having a button for every function meant that I could use the receiver without reference to the manual. Being Sunday morning I went straight to the nine o'clock net because I knew I would find a wide range of signal strengths from stations all over the UK, and it's always a good test of the a.g.c. system for any receiver. Net control was booming in from Hertfordshire with wonderful audio quality, and he soon handed over to David: "Can anyone hear David?" went the cry, and I longed to be able to say "I can" because I could hear him down in the noise but in the clear. That's what a good receiver will do for you! I took the opportunity to have not only the RF-590A on the bench but also an AR7030, R-820 and my trusty Collins 51S-1 and I looked like a madman as I went from receiver to receiver trying to assess their relative qualities on different signals. The results of this exercise were so interesting that I propose to do another article in due course and tell you how I rated each radio.

Having tired of 80 metres I decided to have a listen to Shanwick and keyed in 8.864MHz, or rather I found out that I had to hit the 'FREQ kHz' key then 08864000 followed by 'ENTER'. This certainly got me on to frequency, but as in all these pro' receivers, I found that the tuning control was locked out. I tried poking the 'Tune Rate' button which certainly enabled the tuning knob but I then found that the tuning rate was in 1MHz steps which certainly moved me from d.c. to light at a rapid rate. I then found the only white button on the panel labelled 'RCVR' and tried hitting that. This was the secret, because the 'RCVR' button jumped the tuning rate to 1kHz which is about right for twiddling around. The 'Tune Rate' steps a cursor beneath the main frequency display and allows you to tune in whatever step the cursor is under, right down to the minimum 1Hz synthesiser step. Remember that the HF-2050 minimum tuning increment is 10Hz, whilst a classic analogue v.f.o. driven receiver will have effectively infinite resolution - mind you, it has to be said that 1Hz steps are

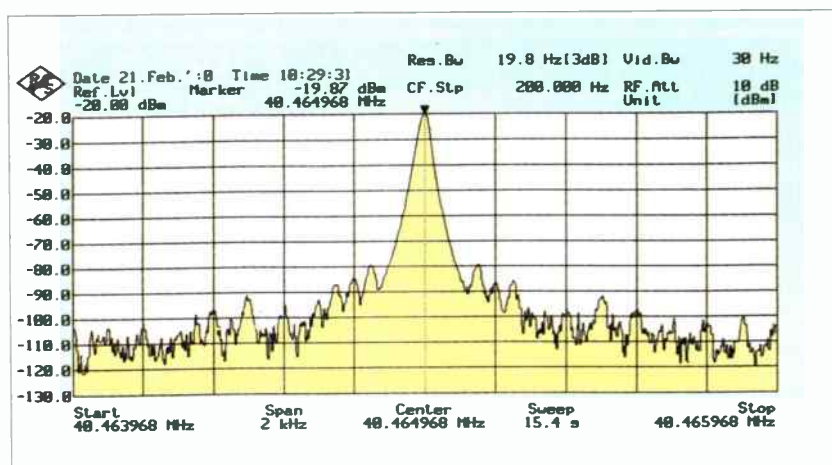


Fig. 3: RF-590A first conversion oscillator close-in noise (quite a lot).

much the same as infinite resolution so it's hardly important. I do find the leading zero entry a bit tiresome when you want to operate below 1MHz, and punching in 0006000 to get to Rugby Radio was a mite confusing. Oh yes; the synthesiser doesn't 'roll over' at the ends of the tuning range, so if you find yourself at 29,999,999 on the dial it's a long way home, and no taxis to be had at this time of night.

Deliberate Design Decision

I use the term "twiddling around" somewhat loosely, because in common with most professional receivers from the US the tuning control on the RF-590A lacks the heavy flywheel

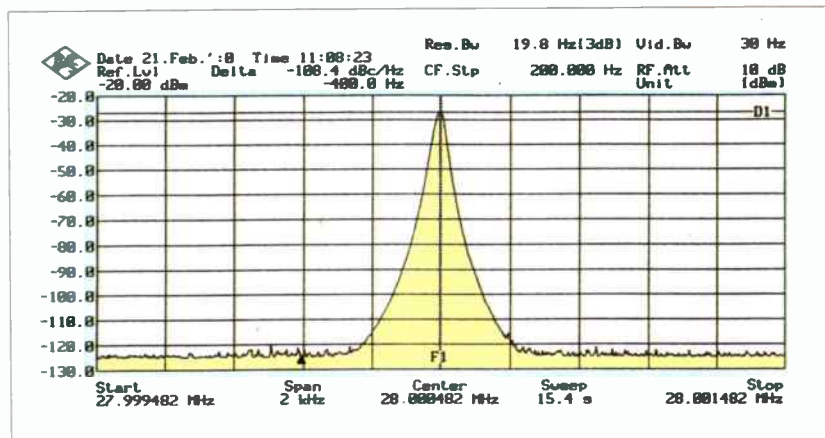
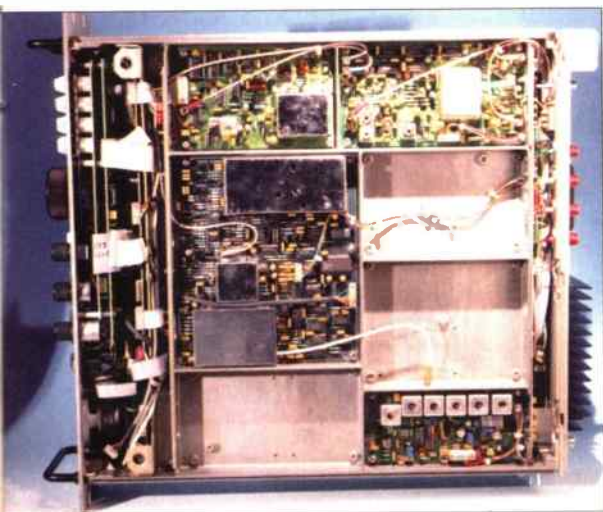


Fig. 4: Collins 51S-1 first conversion oscillator close-in noise (none!).

effect of many British receivers. Although the main knob is a nice size and has some weight to it, examination of the rear of the panel discloses that it is directly attached to the shaft of a Clarostat shaft encoder which makes the tuning action quite 'draggy'. This must be a deliberate design decision, because ball bearing shaft encoders are readily available and use of one of these would have given the RF-590A that relaxing 'spin and grab' tuning action which we Brits seem to love. It all comes from being brought up on Eddystone, although come to think of it, the AR88 had the perfect 'spin and grab' action coupled to that superb tuning knob with the mushroom shape and the deep recess between the top of the mushroom and the knob skirt. Note to the Editor: I simply must find a mint AR-88D and review it. (I'd have lent you mine, but we parted company some 26 years ago - sorry, Ed.).




Continued on page 33...



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Commercially Speaking

...continued from page 31

I found the a.g.c. a bit hard to get to grips with because of the "hang" which kept the receiver gain absolutely level until the end of the hang period and then restored full gain instantly. Listening to Shanwick talking to aircraft with the a.g.c. set to 'medium' decay (200ms) gave an effect like someone spitting into a bucket: "American 519, spit, six-one North, spit, three-zero West, spit, estimating six-one North, spit, three-two West, spit", and so on (Sorry Madam, did I spit on your shoe). Selecting 'Slow' decay was better, but again the abrupt return to full gain at the end of the 2.5s period caused slight paralysis of the eardrums, and I would prefer not to wear headphones when doing this, for fear of permanent damage. However, because the r.f. gain control is a classic "pedestal" type, the thing to do is simply back it off so that the receiver gain is held at a more satisfactory level, but this technique doesn't help listening to the nets with widely differing signal strengths. I think that a rather slower restoration of gain at the end of the decay period would be kinder on the ears, but on real commercial signals, such as Oceanic ATC the slow a.g.c. setting was perfect; and of course you also have a squelch control on the RF-590A. Unlike the HF-2050, the RF-590A squelch is a.g.c. derived and produces a rather curious effect in that if you have the r.f. gain set to maximum and advance the squelch control to shut off the audio, backing off the r.f. gain re-opens the squelch. This is only of significance if you are driving the receiver from the front panel, but perhaps the syllabic squelch of the HF-2050 seems better for the hobby user.

The demodulated audio is quite superb on s.s.b., and equally good on a.m. I tried (of course) my quick test on a.m. at 909kHz and found that the RF-590A could extract the foreign signals at 900 and 918kHz with ease, so this is definitely better than the HF-2050 and very definitely better than the NRD-545 which couldn't resolve either of the 900 and 918kHz signals in the presence of Radio Five Live on 909kHz. The shape factor of the 6kHz a.m. filter was so good that there was no 'monkey chatter', and I didn't even need the narrower 3.2kHz filter to dig into the noise. Wonderful. With a receiver like this I could get quite enthusiastic about Medium Wave DX, but of course I already have the same performance (and I checked them side by side) in the 515-1, so there's no need for me to lay out the kind of money necessary to own an RF-590A.

The RF-590A has facilities for 100 memory channels, each storing frequency, mode, filter bandwidth, a.g.c. setting and b.f.o. offset. Each channel can be recalled individually or scanned sequentially or in groups. The memory dwell time can be varied, and scan stop level adjusted by the squelch control setting, but as with every other receiver of this type that I have encountered except for the AR7030, a single squelch setting has to suffice for all channels whatever the frequency, which makes scanning a bit of a lottery. On quiet h.f. channels the squelch setting can be quite low to stop on weak signals, but lower down in the broadcast bands the

squelch threshold would have to be much higher to avoid the receiver stopping on every frequency. As far as I know, the AR7030 is unique in furnishing a dedicated squelch setting for each memory channel stored. Don't attempt to enter memory channels when slightly tipsy, 'cos the handbook lists the fifteen steps (yes, fifteen) necessary to enter a single channel. I did try it, but retreated after the first few channels with serious brain hurt. You younger chaps will cope admirably, I'm sure.

Testing Times

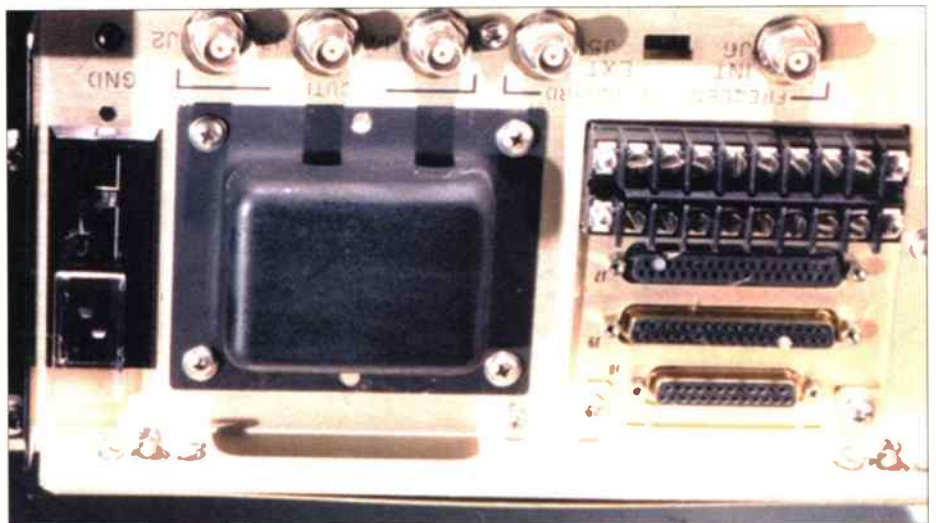
Did I measure its r.f. performance? Well, of course I did, see **Table 1**, but it's expected that a receiver of this breeding just has to be good. There was one surprise, of which more anon, but the raw sensitivity hardly needs listing.

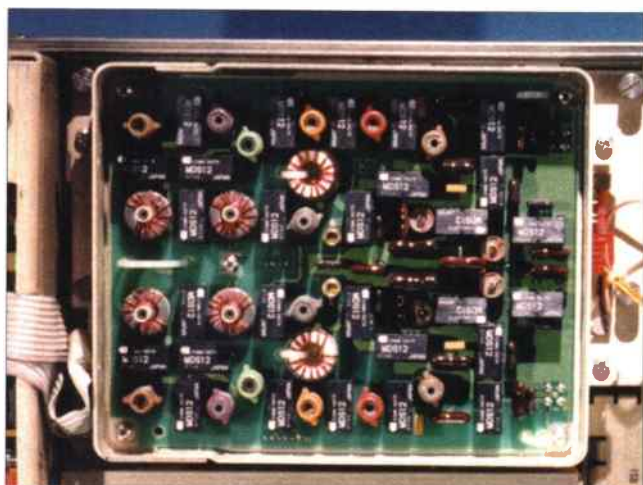
Third order intercept point measured with two crystal controlled sources at 14.038 and 14.058MHz, resolving the product at 14.018 and 14.078MHz came out at +21dBm which is respectable but not outstanding in a receiver of this class.

Second order intercept point measured with two signals at 6.5 and 7MHz resolving the sum product at 13.5MHz came out at +85dBm. Now punters, take a look back at last month's review and see how the Collins HF-2050 came out in this test. No, don't do that, I'll save you the trouble and tell you that it was +50dBm. What's the secret of this apparent 30dB performance increase in the RF-590A? Some of you will recollect that I have banged on occasionally about the value of r.f. pre-selection in h.f. receivers, and it is quite obvious from this result that the RF-590A simply must have a pre-selector built-in somewhere. To check that this was the case I used a sneaky technique involving a return loss r.f. bridge connected to the antenna input socket of the receiver and plotted

Table 1

Frequency (MHz)	Mode	Bandwidth (kHz)	Sensitivity dBm for 12dB SINAD
14.200	u.s.b.	2.8	-111
14.200	u.s.b.	2.8	-111
14.200	a.m.	6.0	-102.5
14.200	a.m.	3.2	-107.5
14.200	c.w.	1.0	-115
14.200	c.w.	0.3	-124
6.500	a.m.	6.0	-103
6.500	a.m.	3.2	-108
0.900	a.m.	6.0	-103
0.900	a.m.	3.2	-108





"The RF-590A is a stunning high performance communications receiver and has (almost) everything a demanding listener could need."

the impedance the bridge was looking into. The results are shown in **Fig. 1** and you can see quite clearly that the input impedance falls towards 50Ω at 13.5MHz whilst remaining high outside this range, and this tells us that there is indeed a preselector

inside the box. Tuning the receiver around also showed that the preselector was being tuned to follow the receiver, and **Fig. 2** shows the response at 8.5MHz. I didn't at this stage go inside the receiver to plot the actual transmission characteristics of the preselector, but judging by the overall performance the preselector was not degrading anything too dramatically. Now:-

You may remember in an early article of mine that I compared the action of a preselector to that of a magic gate across the prairie which could be used to select one white buffalo out of a whole herd, and I can't help feeling that the responses shown in **Fig. 1** and **Fig. 2** show how good that analogy was. The 'gate' is obvious, and the rejection given by that gate at 13.5MHz is the reason for the good rejection of the interfering signals at 6.5 and 7MHz. I rest my case. If anyone reading this might contemplate buying an RF-590A receiver, be sure to take the top off (easy; just six Dzus fasteners) and look at the front corner of the receiver with the front panel facing you. If there is a box with lots of adjustment holes in the top, that's the optional preselector. If the box isn't there I should advise negotiating on the price, because that magic box makes a world of difference to the receiver performance. A man who knows told me that the RF-590A has the preselector, whilst the RF-590 does not, but anyone could still have removed the preselector from an RF-590A before sale so do a physical check before parting with the folding stuff.

Finally, the reciprocal mixing performance which shows the cleanliness of the local oscillator

came out very well at unwanted signal spacings greater than 20kHz, but showed evidence of close-in noise which degraded the figures obtained at 5kHz. To illustrate the effect I took an analyser plot of the RF-590A local oscillator with a span width of 2kHz (**Fig. 3**), and then the same plot of the Collins 51S-1 first local oscillator (**Fig. 4**). Note that the difference in centre frequency is due to the difference in the Collins and RF-590A first i.f. It is quite clear that the synthesised RF-590A is much noisier than the 51S-1 and this translates into poorer reciprocal mixing performance. In addition to the close-in noise, the RF-590A had spurious signals at ±5kHz, albeit at 70dB down on the wanted local oscillator signal, whereas the 51S-1 which uses crystal oscillators in the first local oscillator has no spurious outputs at all.

Let there be no weeping and wailing from RF-590A fans; the receiver can truly be classed as high performance, and the synthesiser noise may well not be noticed in normal use. However, these measurements gave me something to think about, and I hope to expand on the subject in the future article I mentioned earlier.

Time To Summarise

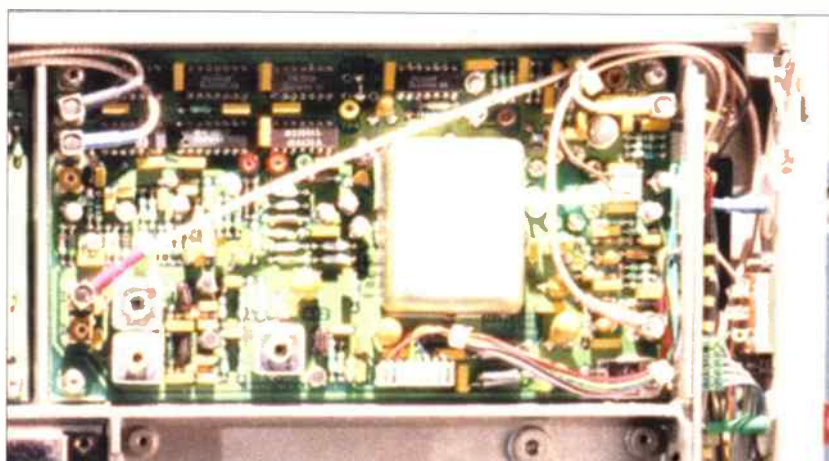
The RF-590A is a stunning high performance communications receiver and has (almost) everything a demanding listener could need. Tuning 10kHz to 30MHz in 1Hz steps allows you to listen to anything you want, including narrow data transmissions and weak c.w. Frequency accuracy and stability are devastatingly good, and the classic i.f. filtering gives excellent resolved audio in any mode. As in all the other pro' receivers I have tested, the one way carousel for selecting receiver functions can be a bit irritating, but operation of the RF-590A select buttons is bounce free and actually very easy. The presentation of information by the two displays is excellent, and you can read them easily at some distance, unlike the HF-2050 which suffered by having no display illumination. RF performance with the preselector fitted is very good indeed, and I can only think of a couple of features which I would like to have had at my fingertips, but I'll tell you about them in a wider ranging discussion later on. What a receiver! Wish I could afford to own one.

Other Things

I was amazed to find that in last month's issue of *Short Wave Magazine*, one of the advertisers had for sale not only the HF-2050 which I had reviewed in the same issue, but the RF-590A and almost every other desirable h.f. receiver I have ever heard of. Let me state right away that I have no connection with the company advertising these receivers, and only wish I had so that I could get my sticky fingers on them. I was delighted to see my favourite 51S-1 amongst the receivers being offered, and at the advertised price I think it's been undervalued. I'll shortly tell you why. In the meantime, may I once again thank the private owner who generously allowed me to deprive him of his RF-590A and investigate it on behalf of all the readers of this magazine.

Happy listening.

Short Wave Magazine, April 2000





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AR3000A



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PCR100

Model	Description	£ RRP inc VAT
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AR5000+3	High performance base receiver with three enhanced options factory fitted: noise blanker, synchronous AM, automatic frequency control.	£1445.00
AR3000A	Unique all mode extremely wide band base-mobile receiver 100kHz - 2036mhz with no gaps. RS232 port fitted.	£679.00
AR3000A + (plus)	Customised AR3000A with switchable narrow SM & SAT filters, Tape relay, SDU ready and discriminator output.	£764.00
AR8200	New advanced wide band all mode hand-held receiver with enhanced microprocessor facilities, slot card options available, multi-function display.	£339.00
AR8000	The New Concept. Wide band all mode hand-held receiver with many microprocessor facilities, dot matrix display and computer compatibility.	£296.00
ICOM R2	0.1300mhz Handie. Fits in the palm of your hand. AM/FM, FM Narrow - 450 memory channels	£139.00
IC R8500	100kHz - 2GHz Continuous. All mode no gaps. 1000 Memories. 4IF band widths	£1440.00
IC-R75E	Excellent all round for the professional listener 0-60MHz. High Stability receiver circuit 100 DB Dynamic range. Twin bandpass Tuning. Optional digital processor. Best selling receiver	£629.00
IC-PCR1000 & PCR 100	ICOM PCR1000 - 0-1300mhz. All modes. Computer driven. On screen programming. Band scope. Instant band scope access via mouse. List of features, call for brochure.	PCR 1000 £299.00, PCR 100 £199.00 (SAME SPEC WITHOUT SSB)

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GPS-48XL GPS receiver good for marine use 12 parallel	249.95
GA-26 Active low profile antenna c/w 8' cable BNC mag/suction for 2/2+/3/45	54.95
GA-27 Active low profile antenna c/w 8' cable MCX mag/suction for 12XL.40	54.95
GA-28 Active low profile antenna c/w 30' cable BNC for GPS-2/2+.3.45XL	79.95
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010-10117-00 Carrying case for GPS-2/2+/3/12/12XL38/40	9.95
010-10051-00 PC4X/6X software & PC interface cable 2/2+/3/12/12XL/38/40/45XL	69.95
101-10048-00 Adjustable swivel/surface mount for GPS-12/12XL/38/40/45XL	17.95
101-10111-00 Dash/surface mount for GPS-2/2+/3	17.95
101-10122-00 Bicycle/handlebar mount kit for GPS-2/2+/3	11.95
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5, 6.25, 10, 12.5, 25kHz
- MEMORIES: 200
- BAND MEMORIES: 10 (user re-programmable)
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ALINCO	DR-140 2M FM	£159.00	KENWOOD	TM-V7E 2 AND 70 DUAL BAND TRANS	£395.00	YAESU	FT-2700RH DUAL BAND TRANSCEIVER	£175.00
ALINCO	DR-M06 SX 6M FM	£159.00	KENWOOD	TS-811E TRANSCEIVER 70cm BASE / AC	£395.00	YAESU	FT-290R 2m Multi Mode	£195.00
ALINCO	DR-M06 6M	£180.00	KENWOOD	TS-140S HF/0-30MHz TRANSCEIVER	£400.00	YAESU	FT-790R 70CM TRANSCEIVER	£200.00
ALINCO	DX-70T 6M HF	£499.00	KENWOOD	TM-255E 2M MULTI MODE	£500.00	YAESU	FT-3000M 2 METER 70W	£220.00
AOR	AR-3000 BASE SCANNER	£395.00	KENWOOD	TS-440 SAT TRANSCEIVER	£525.00	YAESU	FT-8000R DUAL BANDER	£225.00
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ICOM	IC-X21ET DUAL BANDER 23/70CM HANDIE	£225.00	KENWOOD	TL-922 HF AMP	£850.00	YAESU	FT-6200 DUAL BANDER 23/70 CM	£295.00
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ICOM	IC 706 Mk1	£599.00	REALISTIC	DX-394 AS NEW HF	£90.00	YAESU	FT-757GXMK11 TRANSCEIVER	£450.00
ICOM	IC-737 BASE TRANS, INC TUNER 0-30MHz	£600.00	REALISTIC	PRO-2045 BASE SCANNER	£120.00	YAESU	FT-840 C-30MHz TRANSCEIVER	£495.00
ICOM	IC-275H 100W 2M MULTI MODE	£650.00	SGC	230 SMART TUNER	£200.00	YAESU	FT 840	£500.00
ICOM	IC-706MK 11 DSP TRANSCEIVER	£650.00	SGC	2020 10W MULTI MODE HF	£325.00	YAESU	FT 890 HF Gen "as new"	£600.00
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Let's Fly!

Ever wondered what it would be like to operate a flight? What's it like from the pilot's point of view? Now you can find out, here

Godfrey Manning G4GLM explains all.

As an enthusiast you probably follow the aircraft flying overhead your home. At modern jet speed, they don't stay in range for long. Instead, you are treated to a procession of one following another along the airways. Have you ever thought what it's like from the pilot's point of view? Instead of a succession of flights seen briefly from the ground, this article tells you what it's like on a flight passing over various places along its route.

Tracked all the way by air traffic control, who knows how many enthusiasts' eyes are also upon it? I can't give every last detail in a short article but, if you forgive my glossing over some of the points, you should come away with the feeling of what it might be like to operate a flight.

About an hour before departure, Captain Manning and Senior First Officer Christine Mlynek (not their real names!) have met at their airline's operations room at Luton Airport. A medium-sized airline such as ours means that any two crew members only fly with each other occasionally, so standard procedures must always be followed.

We'll be operating the early morning Edinburgh, returning to Luton, followed by Paris and back and, no, it's not over yet, Jersey and return. Some short-haul days fly even more sectors!

Depending on the weather, short-haul has the advantage of getting you back in your own bed at night plus lots of cups of tea. Our airline hasn't a mail, newspaper or freight contract (yet) so we're never flying at night.

Long-haul pilots tend to slip (stay overnight at intermediate destinations, whereupon a fresh crew take over the onward flight). They also get greater allowances to compensate for having to live in luxurious hotels and they get first pick of the business-class passengers' cheese tray.

Chris and I do our jobs to keep us off the streets, the job market being what it is. It worked out luckily, really, as I don't like cheese and Chris never seems to be without a cup of tea on the go. It's not glamorous and there is enough unemployment amongst pilots to be of concern.

The airline industry is not secure. Many large airlines will experience a retirement 'bulge' in the next few years, so more jobs will become available for younger, inexperienced trainees.

'Weather' or Not

Whether we even set off for Edinburgh depends on the

weather. Chris already has the METAR, an actual report of conditions. This cryptically says:

EGPH 120720Z 26012KT 3000 -HZ BKN008 OVC015 02/02 Q0998 BECMG AT0900 6000 -SHRA

Speaking met codes is an art learnt by pilots almost as quickly as identifying unusual cheeses wrapped in individual portions. The above is for Edinburgh (ICAO locator EGPB, all UK aerodromes are EG something) on the 12th at 0720UTC.

Wind from 260° (almost from the west) which suits us fine as runway 24 (i.e. on a heading of 240°) almost points in to it, and 12kt is a windspeed we can cope with. Visibility of 3000m in haze (HZ), I've had worse (but 800m will do us), broken cloud (could be up to 7/8 cover) at 800ft above ground (200 is our limit), overcast 1500ft.

Temperature and dew point are both 2°C, so it's cold and humid, calling for engine and airframe anti-icing to be switched on. The QNH barometric pressure of 998mB is to be set on the altimeter.

The weather is becoming, at 0900UTC, a greatly improved 6000m visibility but in SHowers of RAin. Ah well, can't have everything. At the end of March, can spring be that far away?

Planning

What a sensible idea to plan where we're going in advance! Passengers get all sorts of ideas about navigation and think we spend hours poring over charts and filling out flight plan forms. I'm sorry to say you'll be disappointed.

This flight operates every day, so our computer spits out the familiar flight plan on something the quality of expensive toilet roll (complete with fuel burn-off figures!) and has already submitted it to air traffic control. This is called a repetitive flight plan to you and me, or RPL to a controller.

We still get paid the same, even though the computer did all the work. Good excuse if it's wrong. I can stand in front of the Fleet Manager and say, "Please, Sir, I cannot tell a lie. The computer did it!"

Looking at the routing, all seems as expected and Chris asks if we can accept 'standard briefing'. Why not? We've both flown this route several times this week, sometimes together. So it's a short stroll out to the waiting DC-9 once I've persuaded Chris to drink up the first of her many habitual cuppas. I've given up counting.

It's none too warm at Luton, either, but Chris graciously lets me do the external walk-round, especially as I'll be the

handling pilot for the first sector. Everything looks intact, that big round hole in front of the left engine is meant to be there. It's the outflow valve through which cabin air is exhausted to the outside world.

The only undercarriage locking pin left in place is that on the nosewheel. Don't forget! Otherwise the gear won't come up on demand and the mechanism gets damaged. Can't blame the computer for that one when it comes to explaining to the Fleet Manager.

Gratefully entering the warm aircraft, Chris has already checked the technical log. One passenger seat back is broken and hence out of service, but we're not expecting a full load today.

Overnight, the line engineers changed No. 2 v.o.r. beacon receiver as it was giving slightly inaccurate bearings. The previous crew noted disagreement between the two sets. We're to report any recurrence of the problem. Nothing to worry about there, Captain signs the tech. log and accepts the aircraft as serviceable.

There's some hold baggage even on this short flight. Most passengers are off on a one-day business trip but there'll always be some expecting to stay longer. As the hold door is closed, a reassuringly solid 'clunk' can be heard inside the aircraft.

The ramp agent brings the loadsheets through to the cockpit. Final figures are as expected. Weight allowances are made for each adult and child and for the checked baggage.

Today there are some spare parts in a cargo pallet for one of our rival airlines based in Edinburgh. Hope they're paying us well.

All Aboard

Near to departure, all passengers aboard, and the pre-start checks are called for. Chris reads them out and I action them. The auxiliary power unit (a.p.u.), a small jet engine in the tail, provides no thrust but instead generates electricity to run the aircraft services while on the ground. It also heats the air. Now, what the passengers don't realise is that there are two outlets but only enough air for one. We've diverted the nice warm air into the cockpit, so it's hard luck in the cabin! All other systems are off.

Chris calls 121.75MHz. "Good morning, Ground, it's Shortwave 400. Push and start for Edinburgh please." Chris and I await the verdict: delay or no delay? "Shortwave 400, morning, ma'am, push and start approved, temperature plus six." Chris is ready to copy our departure clearance, surprisingly simple. "Shortwave 400 is cleared to Edinburgh. Olney 1B departure. Squawk 2725. Contact London 119.775 when instructed." And, being a good pilot, her readback is acknowledged as correct.

As you can see from Fig. 1 (all charts by kind permission of the CAA) the Olney 1B SID is an instrument navigation route that brings us to a reporting point called Olney (rather west of the Buckinghamshire village of that name). Navigation is by reference to beacons at

Bovingdon and Henton. If the weather were clearer, Chris could have waved at her home town of Aylesbury (except that it'll be on my side of the aircraft as we turn north after passing the 007° radial compass bearing from Bovingdon).

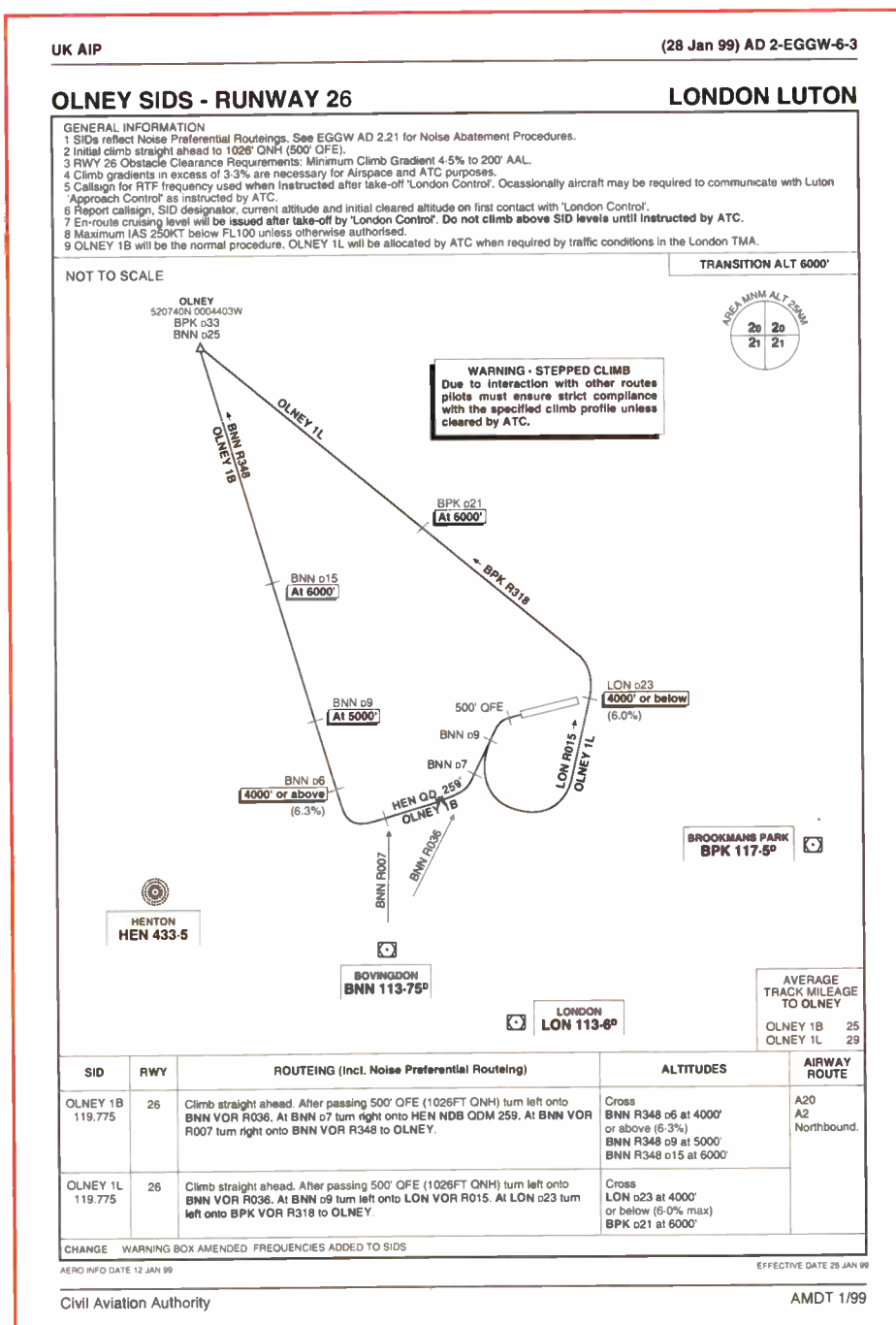
As I'm driving, I talk to the ground engineer who clears us to start engine one (the left one). Actioning the checklist, a.p.u. air is diverted from air conditioning to start the engine. As its speed builds up, around 40% of maximum revs, the fuel valve is opened and we watch the gauges. If the temperature shoots up, a hot start, we switch off and have a rethink!

Thumbs Up

With both engines running, brakes are released and the tow-truck pushes us back from our stand on the main apron (see Fig. 2). "Thanks, ground, see you on the left" I say. On the brakes again, the engineer has disconnected his



Fig. 1: Olney Sids, Runway 26 (not for operational use).





headset and waves that all-important undercarriage pin at me, whilst standing to the left of the aircraft. You passengers might notice him give a 'thumbs-up' sign prior to wandering off and leaving us.

Ground tell Chris that we may taxi to Hold C1. Once there, she changes to Tower 132.55 who in turn clear us to backtrack for runway 26. Once there, it's final checks.

A pair of electrically-powered boost pumps lift fuel from each wing tank; both sets of igniters are on, to keep the engines going should we hit severe rain; the trim is set to make the controls as easy as possible to handle in the climb; only now is the secondary radar transponder set to squawk 2725 so that the London Airways radar controller can see us on her screen.

Take-off clearance is received and, with the throttles set to the required power, the airspeed increases. At the call of "Rotate!" I lift the aircraft off the runway by a firm backwards pull on the controls, followed by a slight check forward as it responds.

Early in the climb, Luton instructs us to call London Radar 119.775 where a lady with a voice both business-like and at once reassuring tells us we can climb directly for the Trent beacon, which Chris obligingly sets on the v.o.r. receiver (115.7MHz). As Captain, I'm pleased with this expeditious direct route as it cuts down fuel

consumption. Chris has mixed feelings as she can see her tea-drinking opportunities being curtailed.

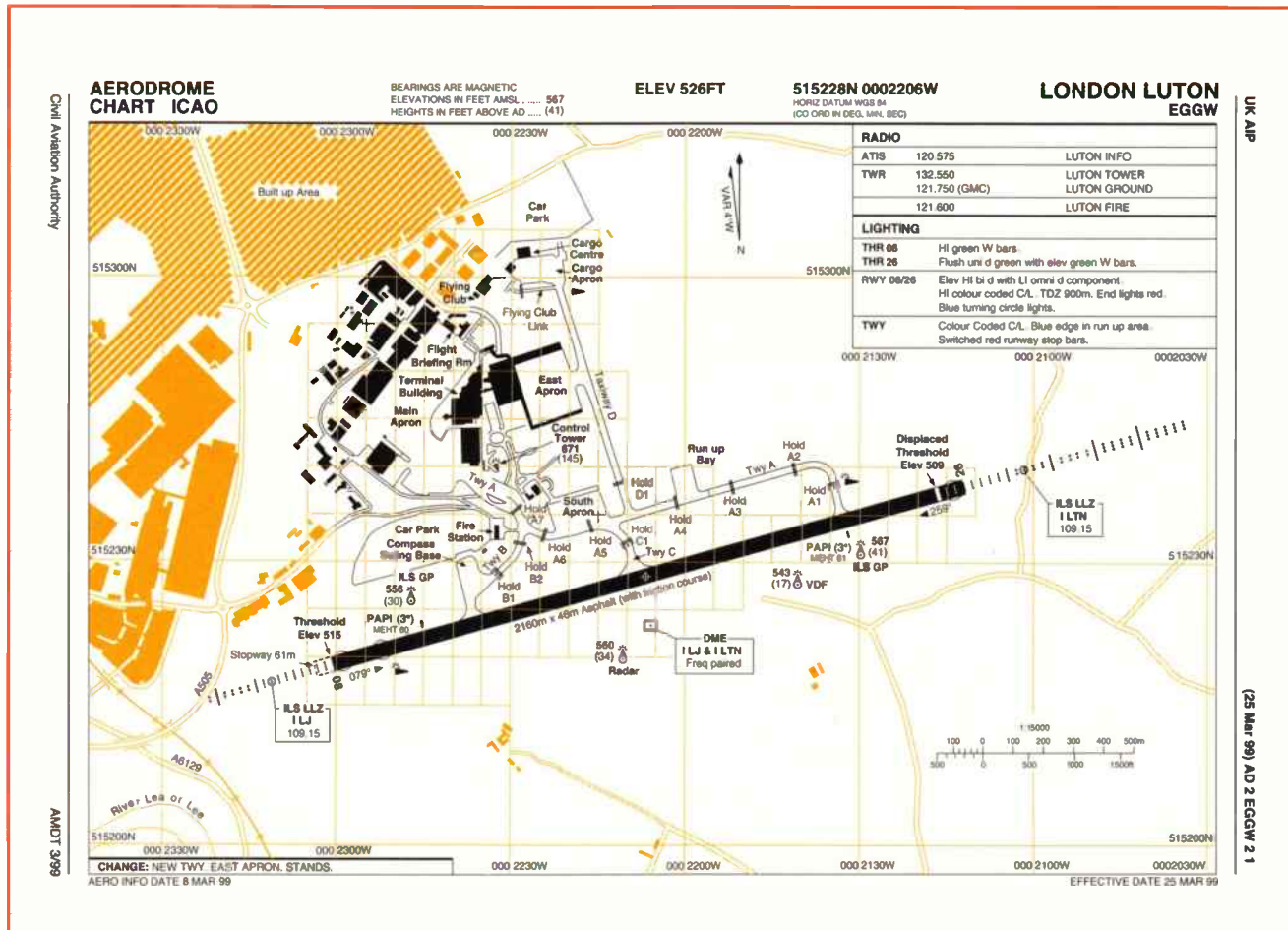
The route takes us along airway Amber 2 to the Pole Hill beacon. "Could you select that on v.o.r. box 2, please?" Chris dials up 112.1 and reminds me that I'm still living in the past. When I trained, airways had colours. There are now too many of them and the rainbow isn't big enough for them all, so I should have said Alpha 2.

Stopping the climb as instructed at FL330 (I have to announce it to the passengers as "33 Thousand Feet" or they don't know what I'm talking about). Chris is quick on the interphone to charm her next cuppa from the cabin crew, coffee for me at this time of morning as she well remembers from last time, and even has chance to nibble at some crisps she brought with her.

Abbreviations

C	Celsius
CAA	Civil Aviation Authority
DC-FL	Douglas Commercial flight level
ft	feet
ICAO	International Civil Aviation Organisation
kHz	kilohertz
kt	knots
m	metres
mB	millibars
MHz	megahertz
n.d.b.	non-directional beacon
nm	nautical miles
SID	Standard Instrument Departure
STAR	Standard Terminal Arrival Route
UTC	Universal Time Co-ordinated
v.o.r.	very high frequency omni-directional radio range

Fig. 2: London Luton EGGW Aerodrome Chart (not for operational use).



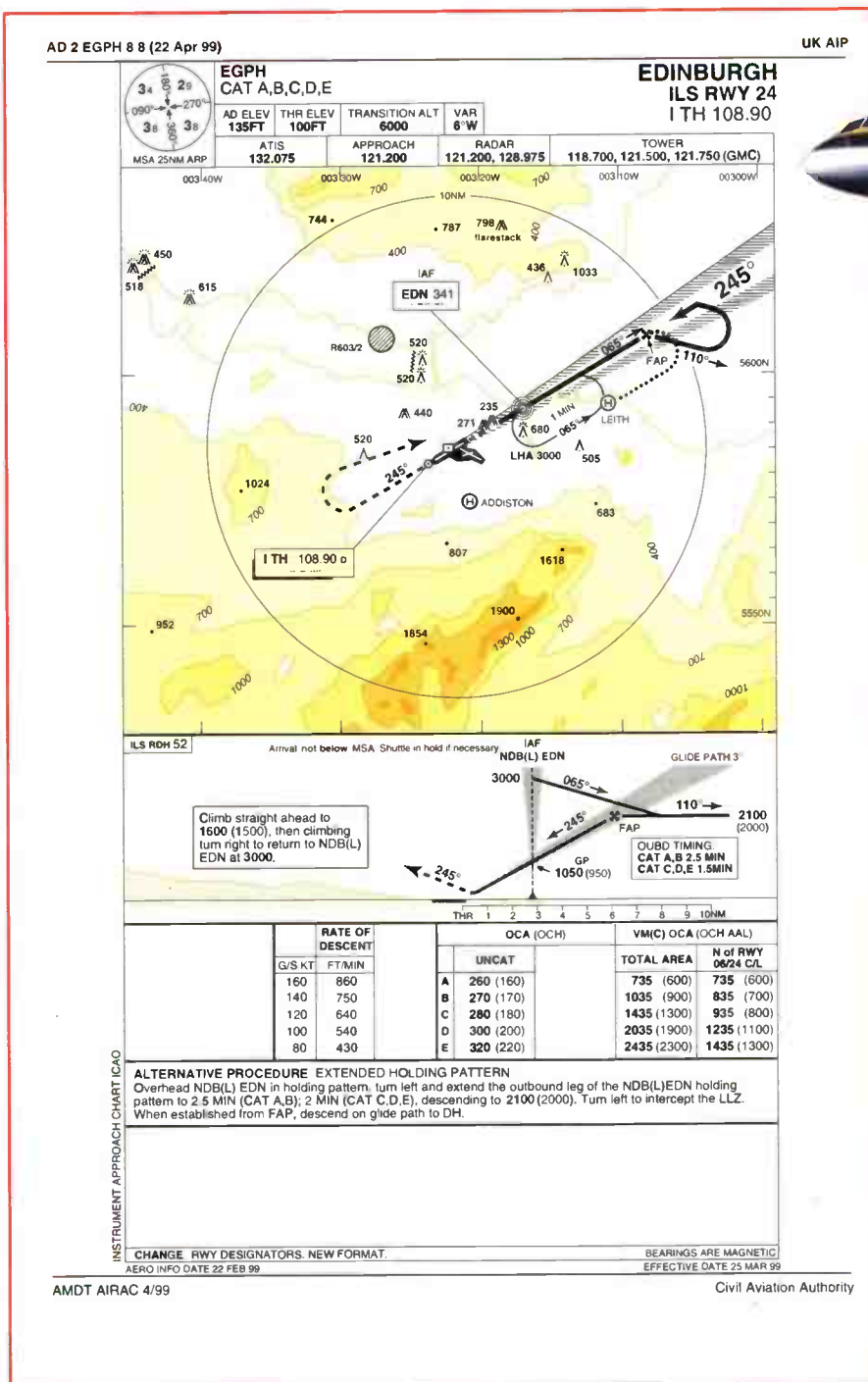


Fig. 3: Edinburgh ILS Runway 24 (not for operational use).

Upper Blue, sorry, Bravo 4, brings us to Talla (113.8) and we're already being descended by the Dean Cross Sector controller, to whom Chris is talking on 129.225MHz. Although there is a published EDN procedure called a STAR, the controller is happy to give us more direct radar-controlled vectors to position us 6nm out from runway 24. Turning north-east from Talla effectively brings us on to the downwind leg in circuit terms.

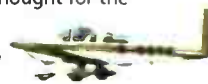
As we approach, the controller asks us to reduce speed. Distance-to-run estimates also help judge how rapidly we should be descending. As Chris reads back each new instruction from the controller, I set up the auto-pilot accordingly. Well, at that time of the morning you need all the help you can get.

Eventually, a left turn clears us to intercept the localiser,

above sea level. Passing over the EDN n.d.b. (341kHz) the chart (Fig. 3) tells us that we should have 1050ft on the altimeter, and I'm relieved to say that we do.

By now, the runway lights are visible in between bits of cloud and I'm happy to earn my keep by disengaging the auto-pilot and making it clear that "I have control, proceeding visually." White and red lights at the side of the runway helpfully tell me that I'm on the glideslope. Any change to the appearance of their pattern and I have to do something about it - and Chris, who's still reading out heights and speeds, will be the first to remind me!

As we taxi to our stand after landing (I like to think it was a perfect one, First Officers keen for promotion invariably agree), at the end of your journey, spare a thought for the poor airman and airwoman who still have most of their day's work ahead of them. Oh, yes, and plenty of tea to look forward to.



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Intercept Point +50dBm IP 3rd order (10MHz/12V)
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16dB -2000MHz
Noise figure 1.5-2dB -1000MHz
1.8-2.5dB -1500MHz
2.5-4dB -2000MHz
3rd order IP +35dB typical

Output impedance 50.75 ohms coaxial
Connector standards N type connector at the antenna. BNC male connector to the receiver
Power supply 12V DC at 160mA DC. Power supply for 230V AC is delivered comes with the antenna
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Airband

In January's 'Airband' I set you a Christmas Quiz. You had to write in, telling me the different types of aeroplane capable of alighting on water. Also, I asked you to place the Catalina into the correct category. As only three of you entered, I take it that the question was either too difficult or that you are adverse to writing! With that in mind, Chris, our photographer, has found some baffling subjects for future quizzes.

Back to the present, though. The recognised categories are as follows. The flying boat operates exclusively from water. Its hull is boat-shaped but it resembles an aeroplane in all other respects. Pre-war, these machines usefully opened up air routes to remote Empire destinations where there was no runway. We didn't have an emperor, either, come to think of it.

Nowadays, it might be practical to operate off water in certain areas. Inland water in Canada, where runways are difficult to build in the forest, is an example. A seaplane fits the bill here. It is usually a conventional light aeroplane whose undercarriage wheels have been replaced by floats. Our American readers therefore know them as floatplanes.

It might be necessary to provide the flexibility of both land and water operation. A flying boat with retractable wheels is the answer and you won't be surprised to find out that it is an amphibian. The Catalina is one of these. Take a closer look next time you see one at an airshow.

My decision is final and I thought the clearest answer was from **Edward Lawrence** (Swanley) who therefore wins the prize, despite a slight muddle over "amphibious seaplanes!"

The "beachable seaplane"

idea of **Gareth Thompson** (Newcastle) doesn't strictly define an amphibian. Many seaplanes can be hauled out of the water on small wheels or a detachable launching trolley, but this doesn't make them amphibians as they can't take off on such small wheels.

I nominate Gareth as runner-up, he clearly spent some effort on researching his answer. He even located an unusual wheel-less aeroplane called the Dingo (despite the fact it's Russian, not Australian). A hovercraft-like action lifts the fuselage on a cushion of air, inflatable bladders

protecting the underside. Operation from water or unprepared surfaces is thus possible. You've taught me something there, Gareth!

Your description of the Dingo sounds different to that other Russian curiosity, the *ekranoplan*. This looks like an aeroplane but can only fly in ground effect. Skimming low across water, the wing's airflow effectively compresses

the air beneath into a cushion. However, there is no fan creating a downflow of air, so it's not a hovercraft.

The other answer was from **Michael Hill** (Brackley). I'm pleased that regular readers such as Michael feel that they have got to know me, almost as if we'd met! Remember, it

can really be arranged if you visit my Museum or meet up at an airshow.

Michael is on the right lines with his answer but, sad to say, forgot about amphibians. He did ask about helicopters. Certainly, they can be equipped with floats for landing and taking-off from water, but they are not aeroplanes and therefore do not have a place in my quiz answer! To be precise, they are members of the rotorcraft (rotary winged aircraft) family.

As you see, there was plenty to think about in such a simple question and I'm sure we've all learned from the experience. To those of you who didn't submit an entry, you can now see what you're missing! Surely you could have turned in a respectable answer? There's always next Christmas...

Accident Investigation

I think we've covered just about all aircraft that are designed for 'wet' operations. On now to a serious topic, the aircraft accident that was mentioned in last December's issue on page 40, 'Satellite TV News.' This crash really did make the news, as Roger Bunney told us in his column. Late on September 14, Boeing 757 G-BYAG was approaching to land at Girona, Spain, in turbulent conditions due to a thunderstorm. Visibility at 4km was good, cloudbase at 1500ft above ground also quite acceptable. The runway, however, had been made wet by the storm.

When runway 02 became visible, the aircraft was not suitably aligned with it and an early decision was sensibly made to go around. With a change in wind direction, the crew decided to make use of the i.l.s. on the reciprocal runway 20.

Unfortunately, visual references were lost after the decision to land had been made (although I would add that a go-around can be initiated at any time if necessary). The resulting touchdown was hard and slightly nose-down, rather than the hoped-for nose-up flare which would present the main wheels first.

The nose landing gear probably collapsed, allowing the fuselage to skid along the runway with loss of directional control. Eventually, the aircraft departed the runway and ended up in a field, breaking into pieces.

The emergency lighting worked as required despite the disruption to the fuselage. All the passengers got out, with a few injuries. Although the description on the news sounded horrific, the accident was survivable.

This information is a summary from *Special AAIB Bulletin S1/2000* ref: EW/A99/9/2 for which permission to publish is granted. It is pointed out that it's of a preliminary nature and that more accurate facts might be established during the formal investigation that follows.

It would be wrong to enter into any speculation about an air accident, no matter how eager those involved (and the press) are to find a quick answer. There is, though, one point that I noticed. The report remarks on an interruption to the mains electric supply in the area at the time of the incident. What caused this? Did the runway lights fail, depriving the pilot of visual references in the conditions of less than perfect visibility?

Also, were there any overhead cables in the way of the approach path that the aircraft could have touched? The aircraft landed at the correct point on the runway, so it doesn't seem likely to me that it was too low on the approach. So, touching cables doesn't seem possible to me anyway. It's just that the fatal crash of a B.737 at Coventry featured power loss when the aircraft actually did cut through cables. However, that was under very different circumstances when the aircraft was definitely much too low by a large margin. We'll have to await the final investigation report to know the answer.



Europa.
Christine Mlynec



Yak-52.
Christine Mlynec

Receiver Hardware

Unfortunately, it would be unwise of me to recommend a receiver to W.M.

Lawrinson (Presalls, hope I've read the name correctly) as what suits me might not meet someone else's needs. I do suggest you decide what you want the set to do, so the civil airband requires coverage 108-137MHz with 8.33kHz channel spacing, military would need 225-400MHz at 12.5kHz spacing (both a.m.). That's a minimum specification.

The only receiver that I personally know of that operates the new 8.33kHz spacing is the AOR AR8200, but it is more expensive than WML's choices of Yupiteru MVT-7100 or VT-225.

The former is a wide-range scanner and as such performance might be a compromise. Sets of this type, in general, cannot exclude certain types of interference (such as pagers). With a dedicated receiver, on the other hand, one hopes for better performance traded off against loss of wideband flexibility. So, do try your intended purchase at a dealer prior to parting with any money! Please note that direct replies to readers are not possible due to time pressures, sorry.

Abbreviations

AAAIB	Air Accidents Investigation Branch
AIP	Aeronautical Information Publication
a.m.	amplitude modulation
B.	Boeing
CAA	Civil Aviation Authority
ft	feet
i.l.s.	instrument landing system
kHz	kilohertz
km	kilometres
MHz	megahertz
v.o.r.	very high frequency omnidirectional radio range

Frequency & Operational News

Information from the AIP amendments is sent in by **Martin Sutton** (CAA) with our thanks as always. There's upheaval among the airways in that corner to the south-west of Land's End where UK, French and Shannon airspace adjoin. New reporting points are ALUTA, GANTO, LARLA, MOSIS and PEMA. Withdrawn are ASKIL, CAVAL, TOVRI and UNROK.

Of the airways themselves in this region, UN490, UN491 (both via MOSIS-ALUTA-TAKAS) and UN512 (via RATKA-LARLA) are moved to new courses. UN521 (via RATKA-LARLA) is a new airway. UN508 is withdrawn. There is overlap between some of the new routings.

Two routes originating at Land's End v.o.r. are also re-aligned onto new courses and they are UR168 (to GANTO in French airspace) and UT7 (via PEMA at the crossing with UN502).

None of these make a major difference but the precise details would be complicated to explain here. Nevertheless, if you require the coordinates for any particular points or routes, write in and I will publish them here.

Alternatively, various sources will sell you an updated chart by post for reasonable cost. One such British product comes from RACAL/Aerad. For details of such sources, send a reply-paid self-addressed envelope (to hold two A4 sheets) to the Editorial Offices at Broadstone (and not to me!). Request the *Airband Factsheet*. Use this to contact your chosen supplier for current price details.

There's a frequency change for Cosford Tower, now 128.825 (was 118.925MHz).

All letters received up to February 9 have been answered. The next three deadlines (for topical information) are April 10, May 8 and June 5. Replies always appear in this column and it is regretted that no direct correspondence is possible.



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Scancat Gold for Windows SE - Platinum Edition version 7.5

When we gave Faris Raouf the chance of reviewing the latest and greatest version of Scancat, he jumped at the chance. So, what did he make of the Platinum Edition version 7.5? Read on and see.

Most modern scanners offer an amazing array of features designed to help you find interesting frequencies to listen to, such as being able to search between two frequencies and automatically storing any frequency where a signal is detected. A few models even offer bandscope facilities to help you see at a glance where all the action is.

However, no scanner currently on the market, not even the mighty Icom IC-R9000, can offer all the signal-finding capabilities that even a very basic scanner can offer you when coupled with a computer running a good scanner control program. The fact is that compared to even a basic PC, the most expensive scanners you can buy through normal channels have relatively small displays, and severely limited amounts of memory in which to hold their programming and any frequencies you might want to store.

Popular Program

One of the more popular scanner control programs on the market is Computer Aided Technologies' *Scancat Gold for Windows*, a program I've used to very good effect in the past alongside the likes of Signal Intelligence's *ScanStar*, and slightly more basic applications such as *RCON*.

So when the opportunity to look at the latest and greatest version of *Scancat* - *Scancat Gold for Windows SE Platinum Edition version 7.5* - came up, I jumped at the chance. The SE in the product's name, incidentally, stands for Surveillance Enhanced, but even with this contraction the whole thing is a bit of a mouthful, so I'll just call it *Scancat* from now on.

Get Going

Before I tell you what the program can do, I'd better tell you what you need in order to run it. For a start, of course, you'll need a computer controllable scanner supported by the program, and the appropriate interface lead or adapter to connect it to a PC.

Unlike some scanner control programs, though, *Scancat* supports just about every radio you've ever heard of, plus a few you won't have. It is well worth checking that

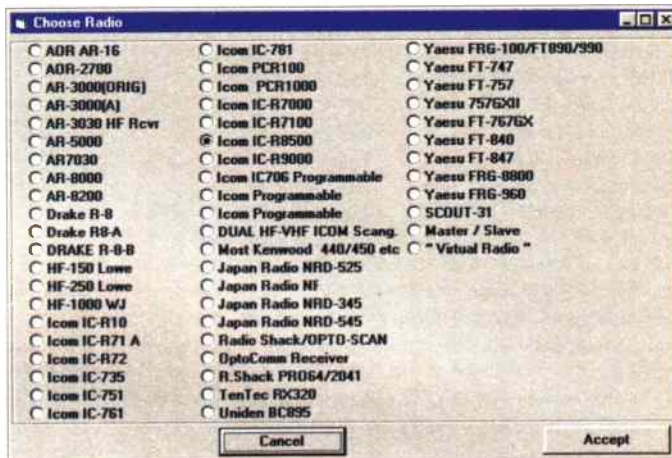


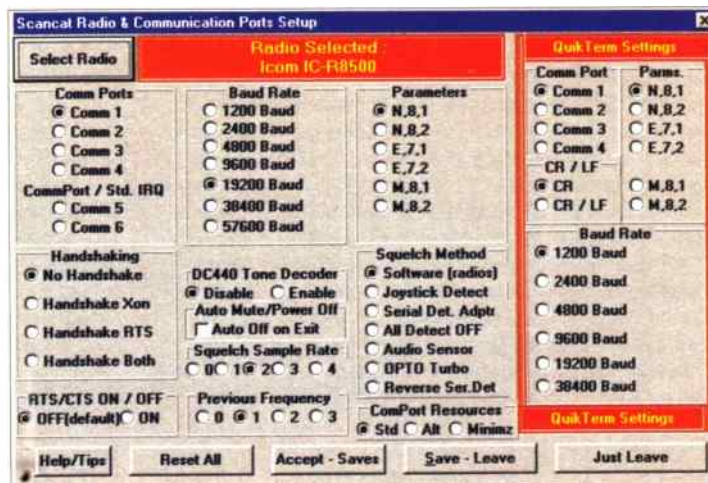
Fig. 1: Scancat supports a very large number of radios.

your particular radio is supported before you buy, though, by visiting the *Scancat* web site at www.scancat.com

You should also be aware that some radios are better supported than others. This isn't the program's fault, instead being due to the fact that some models have less sophisticated computer interfaces than others. I used my trusty Icom IC-R8500 for this review, as I've not got round to buying a computer interface lead for my AOR AR8200.

On the computer side of things, even a quite basic PC will do as long as it has enough processing power to run *Windows 3.1*, *95* or *98*, is fitted with 8Mb or more RAM, has at least 5Mb of free hard disk space. Crucially, it must also have a free serial port for connecting your scanner to. An optional item you may find very useful is a sound card, but I'll discuss this in more detail later.

Fig. 2: Advanced settings galore.



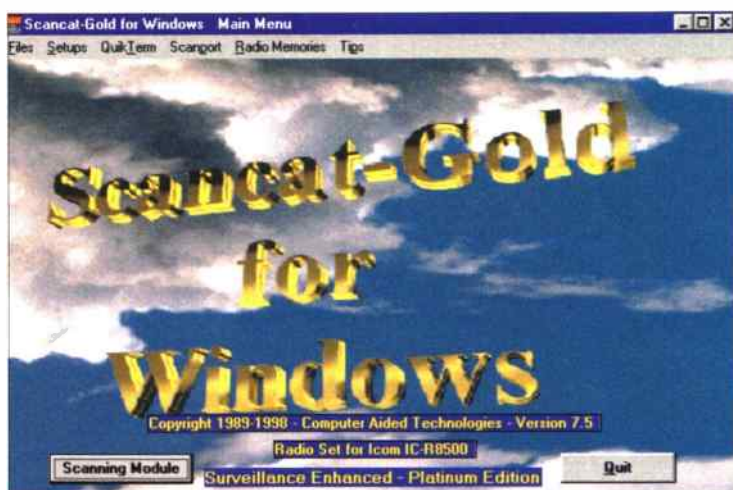


Fig. 3: Scancat's main screen.

Installing

Installing *Scancat* takes no time at all as it comes on just two floppy disks. Once installed, the first step is to configure the program to work with your radio - Fig. 1.

Again this takes very little time, as all you have to do is select it from a list and then choose the serial port it is connected to. If you wish, you can also alter things like serial port speeds and some advanced control settings in order to get the best from your scanner, but I found the default settings worked for me and left things at that.

By the way, for those lucky enough to own more than one Icom-type CI-V-compatible radios, up to six of these can be controlled at once (Fig. 2), a very useful feature but one aimed at the more professional listener.

Up & Running

Once everything is set up, you'll be faced with a rather boring window, Fig. 3, that allows you to perform some house-keeping functions or to jump right into the task of finding interesting frequencies. Since space is limited, I'll just say that the house-keeping functions include the ability to read your radio's memories and store them in a file on your PC's hard disk (and vice versa), and to convert a wide range of commonly used frequency list file formats into database files that *Scancat* can use most effectively. This latter facility is particularly useful, as *Scancat* allows you to search through and tune into all or user-defined parts of a frequency list.

Primitive Display

A click of the Scanning Module button from the boring initial window brings up something much more interesting - the main *Scancat* Scanning Module display - Fig. 4.

Unfortunately, as *Windows* applications in general go, this looks a bit primitive - badly arranged, poorly drawn and a bit too busy. You can improve things by choosing which fonts the program should use, but this doesn't help that much.

Short Wave Magazine, April 2000

Features & Facilities

I think it's about time I told you what exactly you can do with *Scancat*. Unfortunately, I'd need at least ten pages more than I have room for in order to go into detail about absolutely everything the program can do, so I'm going to have to stick with its main features. There are still enough of these to make trying to fit them all into the small space I have available quite an effort, though!

I'll start with the basics - tuning into a particular

frequency. You can do this in several ways. The easiest is by clicking on the small frequency display located under the main tuning wheel and then directly entering the desired frequency. Another option is to use your mouse to move the tuning wheel, and therefore the frequency.

Fig. 4: Scancat's Scanning Module.



Alternatively, you can click on the Up or Down buttons located to either side of it to do much the same thing. Buttons labelled 1MHz next to these two buttons allows you to quickly move up or down in 1MHz increments. An additional way of tuning to a frequency is to click within the 'slide rule' frequency area at the very bottom of the *Scancat* window. The frequencies displayed here depend on the scan range settings you've entered, something I'll talk about shortly.

Incidentally, you can click between the frequencies listed in the slide rule to get intermediate frequencies, or click, hold and slide to move frequency smoothly within the range displayed. Very neat, and very useful!

The receive mode used by *Scancat* can be manually set by clicking on one of the options shown under the main frequency display. Changing the tuning step is achieved by clicking on the word Increment, which is just to the right of the frequency display. This causes a window to pop up asking you to enter your desired increment.

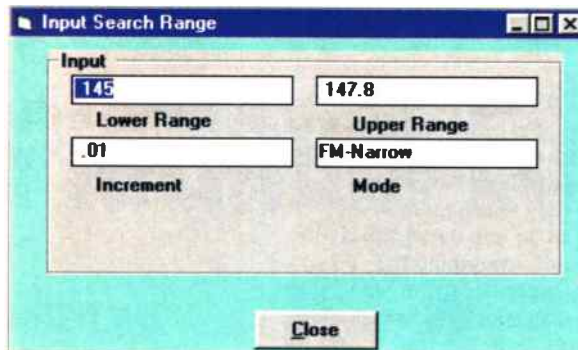


Fig. 5: Searching between two frequencies is a simple matter.

Absolutely any increment can be entered, which is very handy for the proposed new Airband increments. Unfortunately, though, you have to enter the increment in MHz. In other words to get a 12.5kHz increment, you have to enter 0.125.

This can be confusing if you are used to simply pushing a button on your scanner to cycle through the available options.

To help you avoid having to worry about such things, *Scancat* offers individually selectable automatic step size and receive mode settings based on a band-plan built into the software. Rather short-sightedly, though, the band-plan cannot be edited. This is annoying as it appears to be very US-centric.

Other things you can play with, as long as your scanner supports them, are automatic gain control, bandwidth and attenuator settings.

The Exciting Bits

But being able to tune into a single frequency using your computer rather than your scanner's front panel is a relatively useless facility. More exciting is *Scancat*'s ability to scan between two user-defined frequencies. You can either enter these directly plus your desired receive mode and tuning step, or you select them from a list of pre-programmed ones.

The pre-programmed entries can be edited at will, and you can add your own entries to the list if you wish. A useful twist to this 'limit pair'

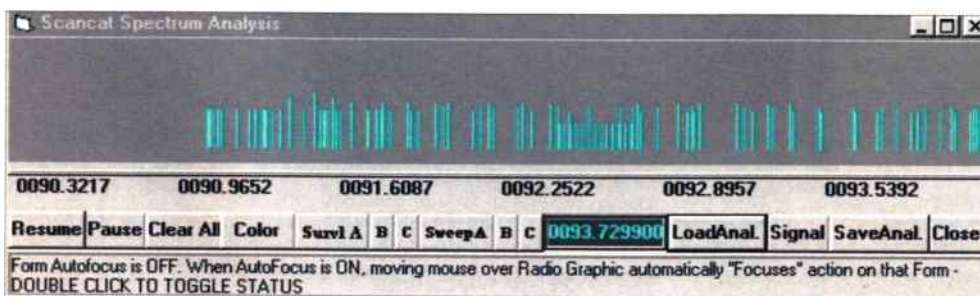


Fig. 6: Scancat's real-time spectrum scope display.

searching is *Scancat*'s ability to scan through multiple limit pairs in sequence if you want it to, as shown in Fig. 5.

As an alternative to scanning between pairs of frequencies, *Scancat* can scan through a list of them, stored in the form of files on disk. You can manually create these files, create them automatically, or import them from a frequency list CD-ROM or downloaded file.

Creating them automatically is simply a case of asking *Scancat* to log to disk any active frequencies you find when you use the program. Very handily, there are seven different log options to choose from.

The first just automatically logs every single hit. The second is much the same as the first, but lets you enter a description into the log file for the frequency in question after every hit. The

third option is similar to the first option, but automatically detects and ignores any duplicate frequencies.

Option four is basically the same as the second option, but checks for any duplicate descriptions and warns you if you are about to save a frequency with a description identical to one already stored. The fifth option is similar to the fourth, but instead of detecting duplicate descriptions, it only warns you if you are about to store a duplicate frequency.

The sixth option simply logs any d.t.m.f. tones received. This only works if you have an Optoelectronics DC-440 or an OS456/Pro radio attached to your system. The seventh (if you've stayed with me this long) and final option is the most interesting of the lot. This log option stores not only the active frequencies found, but also the number of times activity on that frequency has been seen.

Once a log has been created, no matter how, you can edit it to your heart's content, adding comments, altering frequencies and receive modes, deleting frequencies and so on. Any added comments can even contain basic 'macros'. These can be used to do several useful things including causing one of five different audible alarms to sound when activity is found on that frequency during a disk file based scanning session.

Selective Disk Scanning

As well as simply having your scanner search through all the frequencies stored in a log, *Scancat* allows you to scan through only those entries containing one or more keywords. You can also have *Scancat* ignore individual frequency entries within files if you wish, then re-enable them at will. What's more, *Scancat* can search through multiple disk files in sequence, so you can listen to all your favourite frequencies without having to lift a finger.

Birdies And Lockouts

One of *Scancat*'s most ingenious facilities is its automatic Birdie finder. Birdies are basically phantom signals generated internally by a

radio's electronics, though local signals, say those produced by your computer or television, also fall into this category.

By removing your scanner's antenna, clicking on a little Tweetie-Pie icon at the top of the *Scancat* screen, and then having *Scancat* search through from the top to the bottom of your scanner's reception range a few times, the program can automatically lock-out any birdies, ignoring them whenever they are next encountered. Frequencies can also be locked out manually with a mouse click or two, and removed from the lockout list almost as easily should the need ever arise.

Spectrum Analysis

Whenever *Scancat* is scanning between two frequencies it can generate a real-time spectrum

Short Wave Magazine, April 2000

display, like the one shown in Fig. 6.

This shows a graphical representation of the frequency range being searched through, with bars within it showing either how strong the last transmission encountered at a particular frequency was, or how many times a transmission has been encountered at a particular frequency depending on which you want. Clicking anywhere within the spectrum analysis window allows you to tune into the frequency that particular area represents instantly.

You can therefore home in on an area of activity to see what's up. What's more, some extra buttons within the spectrum display allow you to scan between 0.12 and 10MHz of the selected frequency to get more information on exactly what's going on. Another very useful feature is the ability to save the information gathered by the spectrum analysis facility to a file, and then load it later for more detailed investigation.

More Spectrum Investigation

If you want an ever more detailed graphical picture of what's going on within a certain frequency range, you can use *Scancat's* more advanced spectrum plot options. To use these, you must first scan between two frequencies (or several sets of two frequencies if the need arises, as I explained earlier) and have one of *Scancat's* logging options enabled. The longer you leave things running the better, as you'll have more data to analyse.

Once you've done this and collected some data, you can load the resulting log file into the spectrum plotter module. From here you can view the data the file contains using one of eight different spectral analysis display modes, ranging from a simple signal strength display all the way to complex waterfall patterns (Fig. 7).

You also can zoom into the display in order to have a close look at what's happening in a certain area, and even have your scanner tune to the frequency represented by a particular area using the mouse pointer. Some of the viewing options aren't particularly visually spectacular, but others certainly are, and in any case they all offer you an extremely simple and effective way of seeing exactly what's happening on the airwaves.

Digital Audio Recording

I mentioned earlier that *Scancat* can make use of a sound card, and now it's time to tell you why: by connecting a suitable audio output from your scanner into the microphone input of a sound card, *Scancat* can automatically record the audio from any transmission encountered, a bit like a glorified tape recorder.

But better still, you can alternatively have *Scancat* selectively record signals too. Basically, if you scan between two or more frequencies and get the program to create a demographic log file during the process, you can then edit the resulting file and mark any or all of the frequencies that really interest you for recording.

On loading this file and scanning the frequencies it contains, only transmissions encountered on frequencies you've marked for recording will then be recorded. Interestingly, in

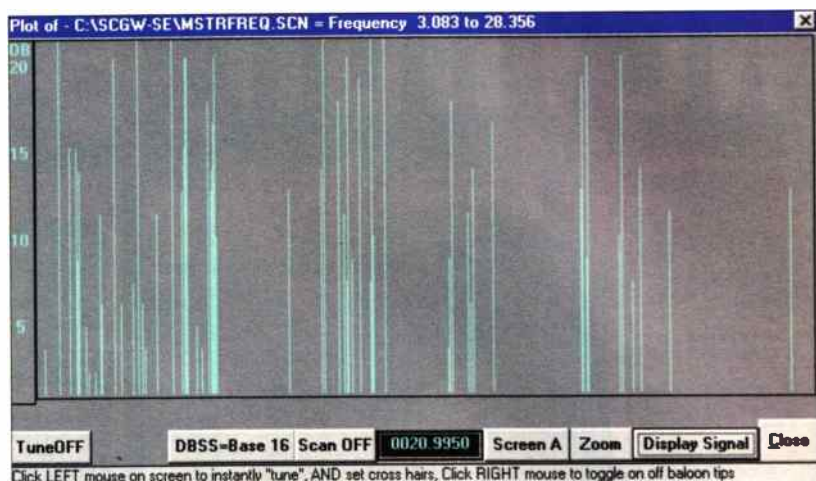


Fig. 7: *Scancat's* spectrum plot screen.

this recording mode the audio is not all stored in one file. Rather, the audio for each frequency where recording is enabled is stored in its own individual WAV file.

Listening to the recorded audio is then a matter of viewing the log file using *Scancat* and then simply clicking on the entry containing the frequency whose recorded audio you want to listen to. Brilliant!

QuickTerm

A final feature I want to highlight is *Scancat's* built-in terminal emulation program, QuickTerm. A click of a button pauses your scanner and brings up this utility, which communicates through a second serial port (if you have one free that is) to a TNC or similar to let you view any decodable data being transmitted on the current frequency.

Bottom Line

I started this review with a moan, and I'm going to end with one too. Yes, *Scancat* is a very powerful and flexible program that makes finding and listening to interesting frequencies a doddle. And yes, it is quite easy to use once you get the hang of things. But it takes a bit longer to get the hang of than it really should because of the program's eccentric user interface and its poor manual. Computer Aided Technology would do well to take a leaf out of Icom's book when it comes to designing manuals and scanner control software.

Having said all this, I do think that *Scancat* has many more good points than bad ones. It also has to be said that no other scanner control program I know of has quite the same mix of useful features and facilities that *Scancat* has. So, if you are after a powerful scanner control application, I'd urge you to take the time to download the demo version of the program that you'll find on the *Scancat* Web site.

If you feel you can live with its quirks, go ahead and buy it, as you'll find that *Scancat Gold for Windows SE Platinum Edition* version 7.5 is well worth the \$159 plus shipping and handling that it costs.

Thanks to **Computer Aided Technologies, PO Box 18285, Shreveport, LA 71138** for supplying the review copy.

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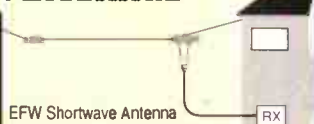
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We've read about the history and technology. This month, in the final part, Dr. Alastair G. Gunn uncovers the science side of Jodrell Bank.

The Science of

The advanced techniques used in radio astronomy provide a unique view of the skies above. In fact, radio astronomy offers the only way to investigate many of the phenomena in the universe. It has been crucial in our discovery and understanding of many kinds of objects. Jodrell Bank, ever since its creation in the late 1940s, has been at the forefront of these astronomical discoveries.

Many types of astronomical objects emit radio waves. The Sun and planets emit relatively small amounts of radio energy. But further afield, all sorts of stars, hot and cool, large and small, are strong radio sources.

Pulsars are a particularly important kind of star first discovered by radio astronomers. The Milky Way, our own Galaxy, is a complex group of perhaps 11 billion stars embedded in diffuse clouds of gas and dust particles. These gas clouds also emit radio waves.

Billions Of Stars

Beyond the Milky Way lurk many millions of other galaxies, each containing many billions of stars. Some galaxies are like our own, others are undergoing intense periods of star creation or may contain huge quantities of obscuring gas. Many are highly active, emitting huge amounts of energy from their centres.

One class of galaxies, called quasars, are the most distant and energetic objects known to man. As well as the huge variety of galaxies that emit

radio waves, astronomers have also detected emission left over from the Big Bang that began the universe about 15 billion years ago.

There are numerous processes by which radio waves are emitted in space, but there are two basic mechanisms. The first is known as thermal emission because it directly relates to the temperature of the emitting material. Generally, the radio waves are created by electrons interacting with atoms, the nuclei of atoms or molecules.

The other type of process, known as non-thermal emission, does not depend on the temperature of the material but is the result of the motion of charged particles. An example of this kind of radio emission is when a

particle is accelerated by a magnetic field. These distinctions are actually very important to the astronomer.

By looking at the spectrum of radio waves, their polarisation and intensity characteristics, it is often possible to deduce the process by which they were emitted. This in turn can tell us a great deal about the physical conditions of the object under study, such as its temperature and density or the intensity of its magnetic fields.

Interesting Objects

One of the many interesting objects studied by Jodrell Bank astronomers are called X-ray binaries. Many of these objects are believed to contain a black hole, an object with such a strong gravitational field that even light cannot escape its surface.

In an X-ray binary the black hole is in orbit around another quite ordinary star. Matter from the normal star is stripped off by the pull of the black hole and heated to intense temperatures, radiating X-rays as it spirals inwards. Most of the matter is sucked in and lost forever, but unpredictable explosions can occur producing spectacular jets of material racing away from the black hole at close to the speed of light.

Recently, Jodrell Bank's MERLIN instrument was used to capture a sequence of images that reveal in graphic detail the explosions from an X-ray binary called GRS1915+105 in the constellation of Aquila.

Masers are sources of radio waves caused by the excitation of molecules in space. The process is directly analogous to a laser in which optical light is used to stimulate atoms or molecules into emitting more radiation. Masers in space have been found around very old stars.

Towards the end of their lifetimes, most stars lose a large amount of their mass through a strong 'wind' of particles leaving their surface. Much of this material forms solid grains in a shell around the star which is carried outwards by the escaping gas.

Molecules of hydroxyl (OH) in these circumstellar envelopes emit radio waves by the maser process. Other molecules, such as water (H₂O) and methanol (CH₃OH), are often found in similar outflows in regions where stars are in the process of forming.

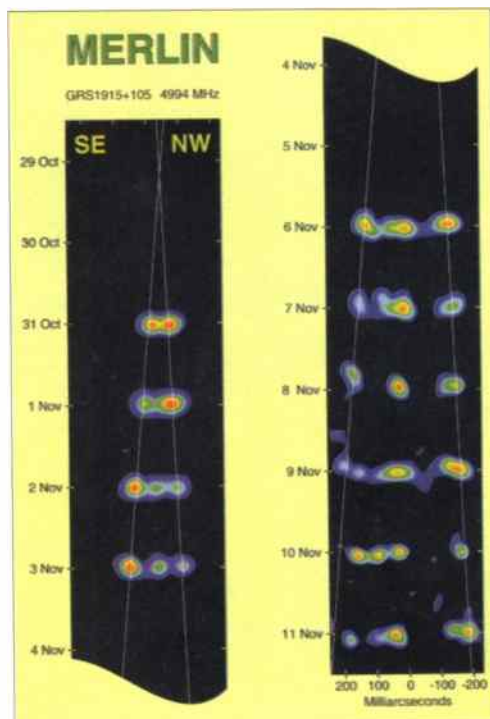
Masers are unique probes of these environments and can provide information about the structure of magnetic fields which are increasingly believed to play a major role in star formation. Jodrell Bank astronomers were the first to demonstrate the compact sizes of OH masers in 1967. Today, MERLIN is the world's leading instrument for imaging OH and H₂O masers in space.

Life End

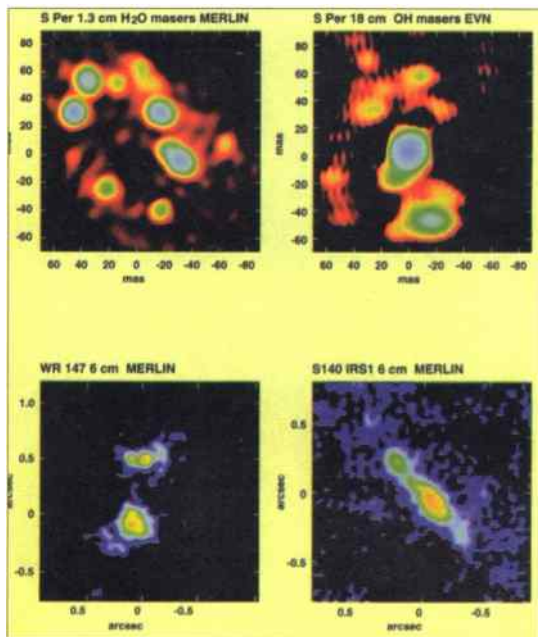
When a star finally ends its life, the energy which holds it up against gravity disappears and it collapses into a smaller, denser object. The outer layers of the star are often blown away in a titanic

Short Wave Magazine, April 2000

Fig. 1. In Autumn 1997 Jodrell Bank's MERLIN array caught this spectacular sequence of images of the X-ray binary GRS1915+105. The two jets of material are racing outward from a central black hole at close to the speed of light.



Jodrell Bank



over 400 new pulsars, pushing the number of known pulsars in the Milky Way Galaxy to over 1100.

Surprisingly, the strongest sources of radio emission in the sky are not even within the Milky Way Galaxy, but are much further away. The centres of many galaxies are believed to contain extremely massive black holes, perhaps 100 million times the mass of the Sun.

These objects pull vast quantities of material into the centre of the galaxy. The heating of this material, and its accumulation in a disk around the black hole, results in highly energetic jets moving outwards from the galactic centre. The jets travel out through the interstellar medium of the host galaxy and sometimes into inter-galactic space.

This mechanism is thought to be quite common in many kinds of objects and is used to explain the structures seen in many kinds of radio galaxies. Quasars, the most distant and energetic objects in the universe, are believed to be radio galaxies in which the jets of material are directed towards Earth.

Fig. 2. Images of the stars S Per, WR147 and S140 IRS1 taken with the MERLIN instrument and a Europe-wide array of telescopes. S Per is a maser source showing a clumpy shell of material surrounding a central star. WR147 is a very hot, very bright star and S140 IRS1 a very massive young star. Both show outflowing 'winds' of material.

Active Galaxy

Starburst galaxies are another type of active galaxy where rapid and efficient bursts of massive star formation are occurring. It is important that we understand the phenomenon of starbursts since it is becoming clear that the early universe was dominated by such galaxies.

M82 is the nearest example of a starburst galaxy at a distance of 10 million light years. This galaxy contains the remnants of many supernova explosions; shells of gas expanding outwards from the dead star that exploded.

The MERLIN instrument is able to see the individual supernova remnants in the central part of M82. Unlike radio waves, the optical and infra-red light from these objects cannot penetrate the dusty clouds which obscure the supernovae.

Radio techniques are thus the only way to study these objects in any detail. Over the last ten years observations have actually revealed the expansion of some of these shells which allows us to estimate their age - typically only a few decades.

Gravitational lenses are the result of the chance alignment of a galaxy and a more distant quasar. The light, or radio waves, from the

explosion known as a supernova.

These rare events can shine brighter than all the stars in an entire galaxy put together! The type of object left over after a supernova explosion depends on the initial mass of the star. Very massive stars end up as black holes, but many become neutron stars: very dense stars only 10-15km across.

Some of these neutron stars have very strong magnetic fields. During their collapse they perform a pirouette, ending up rotating many times a second. The radiation from these objects is beamed along the magnetic poles and when such a beam crosses the Earth, a pulse is detected, like a lighthouse beam. These pulsing radio stars are called pulsars.

The very fast and essentially constant rotation of pulsars means that their pulses are some of the best clocks known to man. Some very old pulsars, which have been spun up to speeds of over 600 rotations per second by material flowing onto them from a companion star, appear to be rotating so smoothly that they may even keep time more accurately than the best atomic clocks here on Earth.

Jodrell Bank has been involved in pulsar research since their discovery in 1967. Pulsars undergo surface disruptions similar to earthquakes on Earth and these can be seen as glitches in the regular arrival of radio pulses.

Material between Earth and a pulsar also affects the radio pulses. Instead of a sharp blip, the pulse is dispersed in frequency like a whistle. Analysing the shapes of the pulses can tell us a lot about the material in the intervening space.

New Search

In addition to regular observations of known pulsars, Jodrell Bank is also involved in searches for new ones. A major new survey has already detected
Short Wave Magazine, April 2000

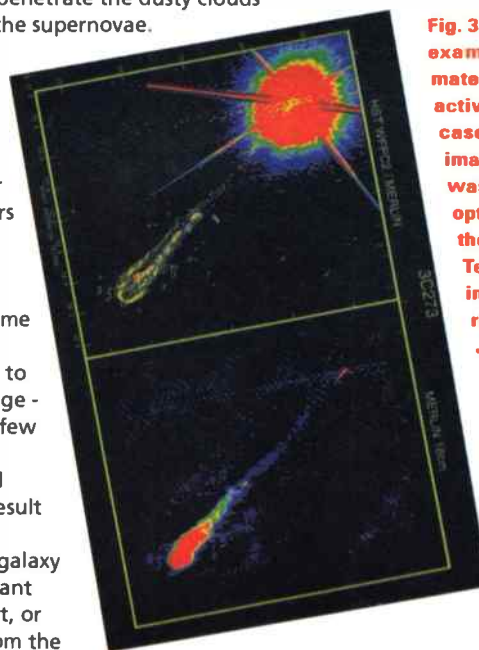


Fig. 3. A typical example of a jet of material seen in an active galaxy, in this case 3C273. The image on the left was taken in optical light with the Hubble Space Telescope. The image on the right, taken with Jodrell Bank's MERLIN array, shows the very strong radio emission in the fast-moving jet.

The Science of Jodrell Bank

Fig. 4. This remarkable image of the nearest starburst galaxy, M82, shows about 50 compact supernova remnants, the shells of gas surrounding exploded stars. The MERLIN instrument has imaged individual shells and actually seen these shells expanding.

You can visit the Jodrell Bank site which is located off the A535 (take J18 M6).

Opening times are daily 1030 - 1730.

Admission charges currently are: Adult £4.60, Child £2.30 and concession £3.30.

Children under 5 years enter free, but are not allowed access to the planetarium. A family ticket at £13.50 allows two adults and three children free access. You can contact the visitor centre by Tel: (01477) 571339.

Visit the Jodrell Bank Web site at www.jb.man.ac.uk

quasar are bent by the foreground galaxy's gravitational field. The magnitude of the effect was first calculated by Einstein over 60 years ago.

The appearance of a gravitational lens depends on the exact alignment of the two objects, but most consist of multiple images of the same quasar! They are like enormous optical illusions in space. If the line of sight to the quasar passes exactly through the foreground galaxy, a perfect 'Einstein Ring' is seen. Recently, Jodrell Bank astronomers observed a spectacular example of this affect in the object known as B1938+666.

Leading Role

From the initial discovery of the first gravitational lens in a Jodrell Bank survey, Jodrell Bank has played a leading role in lens studies. Finding new gravitational lenses is a difficult task because they are not always easily distinguishable from normal radio galaxies.

A recent Jodrell Bank survey discovered four new gravitational lenses. A more ambitious search called the Cosmic Lens All Sky Survey (CLASS) has already started. By observing over 10,000 quasars, the astronomers have so far found around 20 new lenses.

The Cosmic Microwave Background, or CMB, is the remnant of the heat from the Big Bang and was first detected in 1965. These radio waves come to us from the furthest reaches of the universe.

Over the course of the universe's history the radiation created in the Big Bang has cooled to only 2.7° above absolute zero (-273.15°C).

The structure of the universe during its earliest phase was very different to the one we see around us today. Matter was spread very evenly. But if galaxies or clusters of galaxies were to form then, at some point, matter must have condensed into clumps.

These blobs of slightly higher density should have left an imprint on the CMB radiation and astronomers

estimate that the resulting CMB variations should be from a few parts in 10,000 to a few parts in 100,000. Only in the last few years have radio telescopes been constructed with sufficient sensitivity to detect these tiny irregularities.

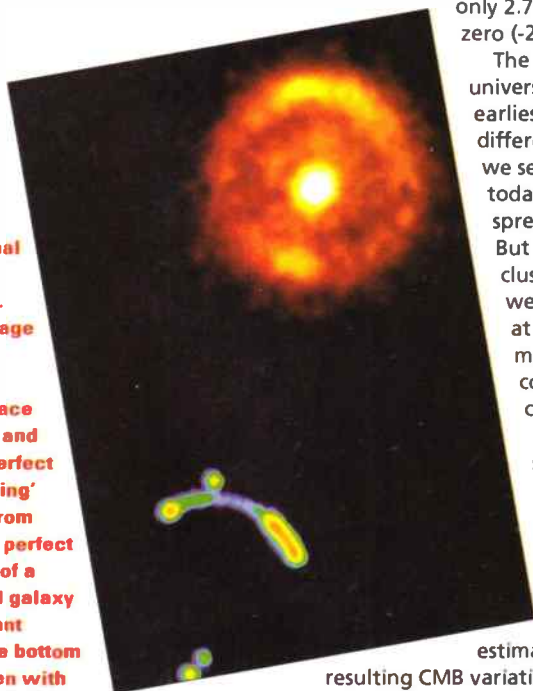
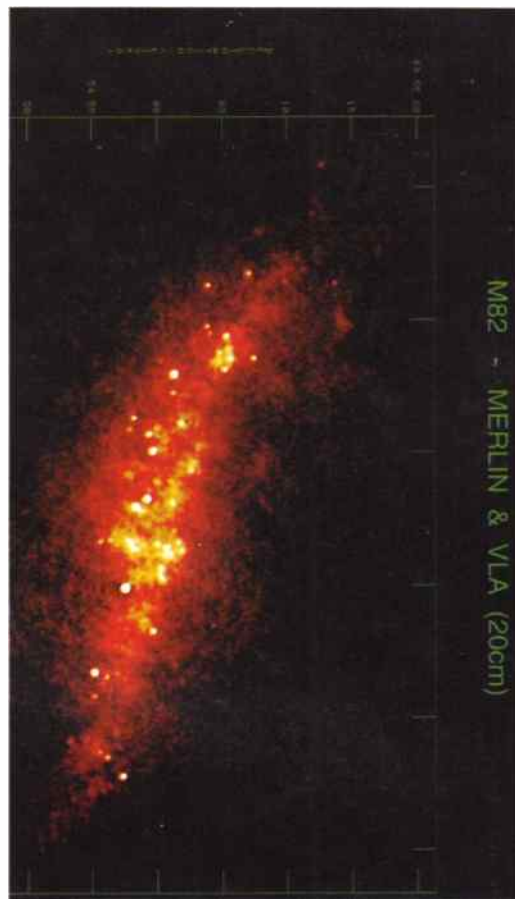


Fig. 5. The gravitational lens B1938+666. The top image was taken with the Hubble Space Telescope and shows a perfect 'Einstein Ring' resulting from the almost perfect alignment of a foreground galaxy and a distant quasar. The bottom image taken with MERLIN at 5GHz shows part of the ring and the core of the lensing galaxy.



Several Projects

At Jodrell Bank, astronomers are involved in several projects to investigate the CMB. At Jodrell Bank itself an instrument has been constructed to measure the contribution of galactic and extragalactic radio objects so these can be removed in subsequent surveys.

On the island of Tenerife four telescopes are operated to explore the CMB variations over a large strip of sky. Jodrell Bank scientists and engineers are now constructing a new instrument on Tenerife (the Very Small Array or VSA) in partnership with astronomers on the island and at the University of Cambridge.

Jodrell Bank will also design and build the low frequency receivers for a forthcoming space mission called Planck Surveyor. Due for launch in 2007, the Planck Surveyor will provide multi-frequency maps of the CMB sky and allow astronomers to accurately determine some of the fundamental parameters of the universe at large.

Modern Research

As Jodrell Bank enters the new millennium it still remains at the forefront of modern astronomical research. Over the coming years several major developments are planned, including the provision of optical-fibre links for the MERLIN telescopes, which will increase the sensitivity enormously, and the replacement of the surface of the huge Lovell telescope. This will enable the famous telescope to operate at much higher frequencies where many astronomical questions are waiting to be answered. The future of Jodrell Bank, as well as radio astronomy as a whole, looks very bright.

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Filter Mode	•	•
Capture Mode	•	•
Backlight	•	•
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Satellite TV News

After the excitement of the new Millennium celebrations and the sheer mass of satellite contribution feeds over the January 1st change-over, the year 2000 settled down into the mid-winter doldrums of routine programme and news exchanges. Early February however and an Afghan airliner touched down at Stansted Airport, the subject of a hijack with 156 passengers and crew aboard further complicated by numbers seeking political assylum in the UK.

A real live hijack on the doorstep a few miles up the road from London and very rapidly several SNG trucks descended onto the site. By late afternoon on the 7th, at least four uplink trucks were found across the *Eutelsat II-F3* Ku-band output @ 36°E. SISLink/ITN LINKS created a high profile signal presence over this period with SIS-26 (UKI-257, 11.678GHz), SIS-35 (UKI-506, 11.080GHz) and SIS-37 (UKI-506 11.080GHz) - with Starbird UKI-94 wheeled in at 11.687GHz.

Most news feeds were live reports 'on the scene' type offerings, though locked-off shots showing the isolated airliner via high gain night cameras were often left 'up' on the link (the hijack ended early hours of Feb 10). Several points arise from the SNG coverage as noted above.

Specific satellite trucks and UKI registration numbers have transparency with operating frequencies. For example SIS-37, UKI-506 has been seen using several frequencies. Service idents are often ignored, the Starbird UKI-94 carried 'APTN BRIZE-PATH 1' which is a hangover from a press conference last June at Brize Norton airfield with UK jets arriving back from the Balkans war front.

Unfortunately, signal levels tend to be marginal and often are at digital threshold with pixellation, breakup, freeze frames and audio clicking out. There has been a degree of uplink sharing (different broadcasters reporting from the same SNG truck) in the interests of non-duplication of technical facilities which is a move to be encouraged.

Meanwhile and checking out the Western airwaves in *NSS-K* @ 21.5°W it does appear that our old friend UKI-149 is but a fond memory. This vintage analogue uplinker now gone to rest - a victim of the new digital technology era. I last noticed UKI-149 early morning of January 10th with a 'flu epidemic hospital visit @ 11.530GHz-H into GMTV. Farewell old friend...

With the apparent demise of GMTV feeds via *NSS-K*, I checked out a possible (and cheaper?) alternative, that of *II-F3* @ 36°E on February 4th. At least three SIS trucks were active on familiar frequencies of 11.055; 11.080 and 11.071GHz - all H with item content ranging from the Millennium Dome, dentists and Jodrell Bank.

A fourth SNG truck - UKI-418 (SIS-29, 11.675GHz-H (5632+3/4)) - was on extended uplink duty in Belfast covering developments over the IRA arms hand-in and government changes. The uplink was maintained over several days almost continuously for CNN reports into their news output.

February 8th saw a successful Globalstar live LEO launch courtesy of the 'Boeing Delta Launch Control' carried over *NSS-K* @ 11.529GHz-H (SR 5632; FEC 3/4) from about 1930. LEO's are low earth orbiting satellites making up an operational constellation of about 45 satellites intended for mobile 'phone/comms useage with global coverage. Transmission ended with colour bars and integral ident 'BOEING GS-7'.

Same evening and tuning slightly further up *NSS-K* found French pony trap racing from Cagnes-sur-mer. The transmission - from 2000-2130ish - comprised both live and recorded highlights of at least seven races, carried by Globecast @ 11.607GHz-V, SR 6116; FEC 3/4. Service ident - 'GCCP00CI'.

A less happy logging was on February 2nd with BBC Scotland running their 'UKI-534 BBC DSNG' from Douglas Head, overlooking Douglas, Isle of Man, on the often used BBC frequency 11.600GHz-H (5632+3/4) at 36°E. The 1815 onwards satellite feed was an update on recovery attempts from the sunken fishing boat *Solway Harvester* which was lost in the Irish Sea late December with all crew. Their bodies

Digital news item showing French beach workers clearing crude oil sludge after a tanker sinking off the West Coast, via Eutelsat II F3 @ 36°E.



were still on the craft and the IoM government as a humanitarian gesture was paying for their removal for burial by their families. The recovery mission proved successful two days later.

Eutelsat's II-F3 bird is really becoming the hot spot in the Eastern sky. January 26th and the Swedish uplink truck SWE-013 was providing news reports from the Holocaust Education Conference in Stockholm 'ABC NEWSFEED SWE-013' for the Atlantic path into the ABC American TV network. Content covered both Nazi war criminals, concentration camps and atrocities in Latvia and how to maintain a high profile awareness of crimes past for the present and future.

Significant was mention of Austria which has undergone localised civil unrest and international concern following a significant pro-nazi election win for their government. The ABC news feed was carried on the familiar 11.600GHz-H - 5632+3/4.

It's been a sporty period for our athletic readers (including **Dean Rogers**, SE2) that have tracking dishes - *Telstar-12* @ 15°W carried real analogue national championship volleyball out of Bergamo, Italy, night of January 23 from 1700, 11.135GHz-V with commentary @ 6.60MHz and FX (sound effects without commentary) @ 7.20MHz.

Football folks were entertained if you had C-Band since *Arabsat 2B* @ 30.5°E relayed live the *African Cup of Nations* from Accra, Ghana via S.A.V. Gabon OB facilities -3.990GHz-RHC with audio 6.60MHz - on a 1.5m dish the picture is very noisy needing TE (threshold extension) to clear the sparklies.

For these winter evenings, *NSS-K* @ 21.5°W is a favourite for international sports transmission. Take for example January 16 on the Globecast digital bouquet - 11.590GHz-V, SR 20145; FEC 3/4. On ch.1 there's ice hockey between Ottawa v. Capitals; ch.5 has the USA Mens Soccer match between the USA and Iran, played out at the Rose Bowl, Pasadena, Texas, for the ESPN sports channel and ch. 6 meanwhile has the more gentele 'Ladies Professional Golf Association' (LPGA) offering golf in *The Office Depot* playoff tournament at Palm Beach for the American sports group ESPN.

A few days later, again via the Globecast package, the 'Sabaru Memorial of Naples' golf contest was played out (ch.2). Meanwhile on ch.3 the more spectacular *Bob Hope Chrysler Classic* golf match was played out at the Bermuda Dunes Country Club, California, for ESPN. The setting was quite beautiful with blue skies and a heat haze, contrasting with the UK weather outside my window which was a dark January night at -5.2°C!

The heat and sun was very apparent on January 24 with an early morning update feed via 'Retevison E-19' (a Spanish uplink truck) with footage and reporter summaries of performance updates covering the Dakar-Cairo race, this for early morning anoraks @ 0715, *NSS-K*, 11.550GHz-H (5632, 3/4). This year, instead of the usual North-South Paris-Dakar, the route is across North Africa to Cairo. Intelsat provided most of the satellite links via their 511 bird at 29.5°W, an often overlooked satellite - as most DXers this year have also overlooked! (see news section).

Occasionally 'Sky Sports News' leases capacity via *Intelsat 801* @ 31.5°W, I found them sat on 10.995GHz-V (digital 5632+3/4; familiar VPID 308, APID 256) - well it was



Colour bars from Venezuela via NSS-K digital.



Prior to the news transmission an ornate VTR clock appeared.



Analogue transmission of 'The Miracle Channel' via W3 @ 16°E, 11.176GHz-V.

actually a test card with the additional id 'BT-TES-34', but I am advised that sports news, events are seen at this spot on the dial.

Mr and Mrs Clinton were talking to their academic friends in the White House afternoon of January 20th (1830) about 'Education and the American Dream' (21.5°W, Reuters lease 11.566GHz-V 5632+3/4). After the speeches, the couple mingled informally with the gathered ensemble, obviously enjoying their freedom without bodyguards shadowing every move, though examination of my photographs later revealed their security heavies lurking very closely - just in case...

Roy Carman (Dorking, Surrey) also noted Dakar-Cairo footage via *NSS-K* with cars and motorbikes racing across the Libyan Desert...and personal comments in his letter relate to military experience; Roy related that he has operated inside the vast hostile desert, it is not easy to drive in let alone navigate! One night he received the instruction over the radio "follow the moon, when you hit the road turn right" he got there - h.f. radios in the desert at night are difficult, c.w. is the only way to communicate.

Mid January saw the well publicised Time Warner/AOL merger. Roy noted the first overtures on the 10th January with a digital insert - *NSS-K*, 11.565GHz-V (5632+3/4) which was followed with an analogue corporate January 14th again on *NSS-K*, a displayed test card listed all the various companies now incorporated within the Time Warner/AOL empire - there's a lot in the new digital megalith!

Mid January and Roy noted - again on *NSS-K* - a relay from Reuters, Moscow, including co-incidently PTP network programming prior to the feed. This glimpse of Moscow domestic TV revealed a film of vampire action and an attractive blonde pathologist examining a vampire's victim - a few years ago typical Russian programming would be defeating the Germans in WW2 or the latest tractor used in a Siberian workers co-operative!

Space launches are so routine these days that NASA-TV, etc. provide TV coverage freely - February 11th and the latest Shuttle launch was seen across Europe on *Kopernikus DFS-2*, 28.5°E in clear analogue, 11.597GHz-V from 1800. End of January and Roy Carman checks out *Intelsat 801* @ 31.5°W and at 10.983GHz-V (SR 12515; FEC 3/4) finds the full Tyson boxing fight from Manchester as per Sky Sports and in the clear, i.e. no encryption (this was a Sky PPV event!) - however there is a catch - the commentary was in French!

A couple of digital sightings on rarely reported *Turksat 1C* @ 42°E, 10.980GHz-V, (SR4687+3/4) and 11.495GHz-V (SR3000+5/6) in parallel - this a feed out of Ankara, Turkey for CNN; and *Eutelsat II-F4* @ 10°E with more Turkish views of the ruins around Izmir, underground burial chambers, huge temples and archeological ruins - unusual parameters @ 11.012GHz-H, SR 2171; FEC 7/8.

Satellite News

The American 'E! Entertainment TV Network' is to open a Scandinavian version of their channel in partnership with Stockholm's 'NonStop Television'. The 'E!' channel opens September 1st on a PAY-TV basis over the Canal digital platform offering 24-hour programming with 10% locally made content. The main language will be English with dedicated subtitles for appropriate target regions.

The UK's 'BT Broadcast Services' have won a contract to provide France's national broadcaster TF1 (+ its news channel LCI) with 16 satellite uplink stations in 13 major French cities and others in London, Rome and Berlin. The new system will include TF1's SNG fleet working through the BT system, BT also providing full maintenance and operation of the new system.

For satellite anoraks with Lottery wins then check out the Alteia (not Altai!) model PSR-942 receiver for MPEG 4:2:2 transmissions, this will enable display of the EBU news feeds carried principally via W2 @ 7°E and invisible on our standard MPEG-2 that we use. The receiver is intended for professional users.

Check out the spec on www.linkres.co.uk - but also note the price at £1800 + VAT. (I have declined a review sample feeling it pointless as the price is beyond the pockets of 99% of our readers and departs from a hobby machine!). **John Locker**, SWM contributor, will be reviewing the PSR-942 in *What Satellite TV* magazine shortly.

In recent times, there has been concern over the 'interoperability' of digital satellite equipment used within the communications area. Intelsat have carried out tests in December on both MPEG-2 and 4:2:2 versions with most offered equipment coming up to a compatible standard - those manufacturers that 'failed' the tests are being consulted to encourage a compatible standard within the industry.

Intelsat recently used the 29.5°W *511* satellite for the Dakar-Cairo rally. Two full time SNG units were used along the route, one in use whilst the other drove or rigged in a leap-frog technical operation. The *511* is an elderly craft within inclined orbit requiring a tracking receive dish. During the race the *511* Ku satellite beam had to be repositioned three times to maintain optimal signal communication.

Intelsat have placed orders for additional satellite craft in recent weeks. 'New Intelsat-Alpha' will slot at 50°W for Atlantic Ocean region service - the *Matra Marconi* craft have no delivery in orbit date advised. Two more of the current IX series craft have been ordered from Hughes. The *906* and *907* arrivals will be slotted for Atlantic Ocean region service allowing other in-service craft to be repositioned at 29.5°W and at 178.5°E (Atlantic and Pacific respectively).

Meanwhile in the Eutelsat camp, the FCC (Federal Communications Commission, USA) have confirmed issue of licences to several American operators allowing State-side based teleports communication into Europe via the Eutelsat 'Atlantic Gate' slot at 12.5°W on the *II-F2* bird. This position is being re-enforced during 2001 with launch of the dedicated 'Atlantic Bird 1' with another 20 Ku-band transponders. Eutelsat has currently leased four Ku-band transponders on *Telstar-12* @ 15°W for increasing trans-Atlantic capacity.

Eutelsat have also ordered a new satellite 'NEWBIRD' from Alcatel Space which will sport 26 Ku-band transponders with switchable target beams designed to reach into North, South Americas' and Europe and due for launching summer 2001. Provided three other timetabled launches are successful, then 'Newbird' will be moved into an 8°W slot (the *Telecom 2A/D* position) and suffer a name change to 'Atlantic Gate 2'. At the 8°W slot the satellite will go into a trans-Atlantic customer operation mode with up to 37 Ku-band transponders from this slot with existing active capacity.

An interesting development in the Pacific Ocean area with the French TV/Radio service 'RFO' encouraging various Pacific Islands to pool their TV services together and create a generic Pacific Ocean international programme channel. Currently RFO and Canal+ have digital capacity on *Intelsat 701* @ 180°E with the New Caledonian TV service adding certain of their programming into the programme bouquet from March this year.

RFO are encouraging other islands such as Tonga, Fiji, Samoa, etc. to provide programming and further expand Pacific flavour programming. Interesting to note that the New Caledonian programming for RFO is sent back to Paris via Terrestrial fibre optic cable, it's added into the Canal+ bouquet make-up and uplinked back to 180°E where its transmitted back to the general Pacific area and its surrounds.

Egypt is creating a 'duty-free investment tax zone' for media operators near Cairo that will encourage programme makers and channel uplinkers to locate their operations in Egypt.



After his speech for the Education and the American Dream conference, President Clinton mixes happily with academic friends, note the serious bodyguard - top RH corner! Via a Reuters feed on *NSS-K* digital.



A Jordan-Lebanese news exchange via *Arabsat 2B* @ 30.5°E at 4GHz in C-Band.



Check out *Intelsat 801* @ 31.5°W for this digital test card.

The Bob Hope Chrysler Classic golf tournament from the Bermuda Dunes Country Club, CA, this punter has invited the sound fx man to take a close up sound with his gun mic! via Globecast news, *NSS-K*.



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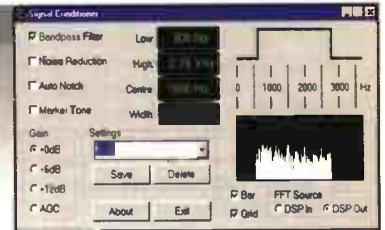
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Model Name/Number

WR-1000

WR-1500

WR-3100

Construction of internals

WR-1000i/WR 1500i-3100i-DSP- Internal full length ISA cards

Construction of externals

WR-1000e/WR 1500e - 3100e - external RS232/PCMCIA (optional)

Frequency range

0.5-1300 MHz

0.15-1500 MHz

0.15-1500 MHz

Modes

AM,SSB/CW,FM-N,FM-W

AM,LSB,USB,CW,FM-N,FM-W

AM,LSB,USB,CW,FM-N,FM-W

Tuning step size

100 Hz (5 Hz BFO)

100 Hz (1 Hz for SSB and CW)

100 Hz (1 Hz for SSB and CW)

IF bandwidths

6 kHz (AM/SSB),
17 kHz (FM-N), 230 kHz (W)

2.5 kHz(SSB/CW), 9 kHz (AM)
17 kHz (FM-N), 230 kHz (W)

2.5 kHz(SSB/CW), 9 kHz (AM)
17 kHz (FM-N), 230 kHz (W)

Receiver type

PLL-based triple-conv. superhet

Scanning speed

10 ch/sec (AM), 50 ch/sec (FM)

Audio output on card

200mW

200mW

200mW

Max on one motherboard

8 cards

8 cards

3-8 cards (pse ask)

Dynamic range

65 dB

65 dB

85dB

IF shift (passband tuning)

no

±2 kHz

±2 kHz

DSP in hardware

no - use optional DS software

use optional DS software

YES (ISA card ONLY)

IRQ required

no

no

yes (for ISA card)

Spectrum Scope

yes

yes

yes

Visitone

yes

yes

yes

Published software API

yes

yes

yes (also DSP)

Internal ISA cards

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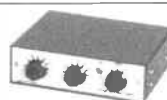
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73 from Dave G4KQH, Technical Manager.

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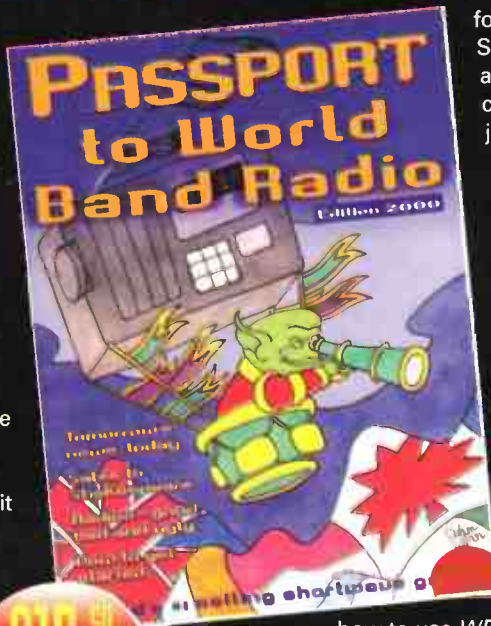
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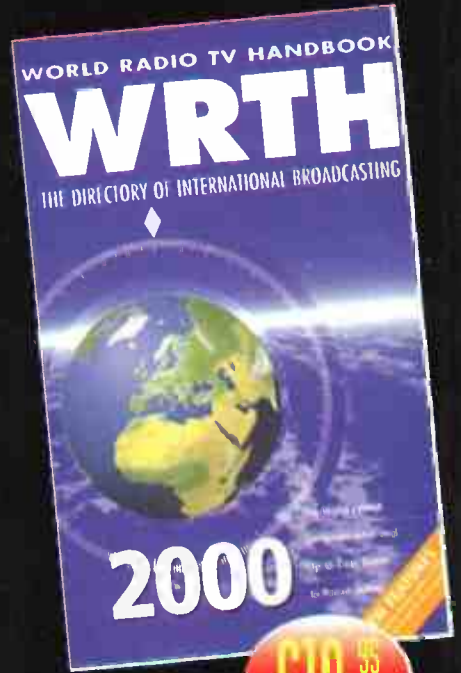
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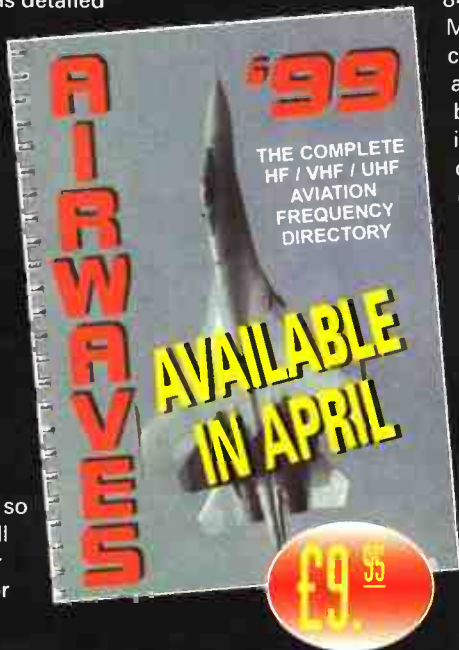
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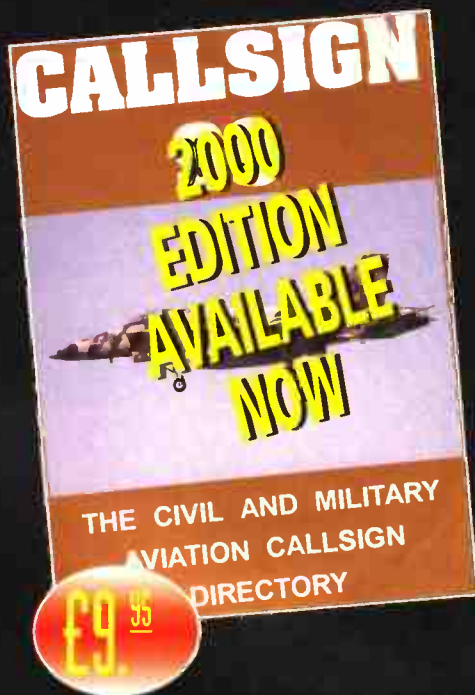
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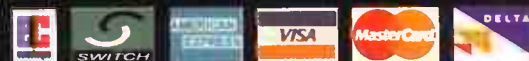
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MilAir

Splitters

I have been contacted by **Steve F, Dave P and Gordon** who were all interested in my use of an antenna splitter as mentioned in the recent 'MilAir Special'. Consequently, I shall attempt to answer all their various questions in one go.

The splitter that I use is an RF System SP-3 which works from 10MHz to 2.5GHz, (obtained from Lowe Electronics) though there are others available. Joe Carr recently had a two part article on constructing splitters and combiners. (SWM Oct and Nov 1999 - Ed.). The low loss coaxial feeder from my double discone is fed into the BNC input of the splitter, the antenna signals are then available to two isolated BNC outputs on the splitter box. The whole point of having the splitter is to prevent interaction of the two radios connected to the same antenna. It is also possible to combine the signals from two different antenna for one receiver. This is achieved by connecting the antennas to the outputs and the receiver to the input. Very useful if you happen to have both a directional antenna, say a Log Periodic, and a discone or similar.

The only down side of the splitter is that there is a loss of 3dB but this is hardly a problem. I have been using the SP-3 for three years and it works well for me on both v.h.f. and u.h.f. airbands.

The one drawback is that the splitter costs more than a good quality stainless discone, a quick check today confirmed that the current model retails at about £69. Even so, I think it is a good investment compared with the loss of signal and the hassle of interaction between two radios.

Mildenhall

After the cancelled Air Fete of last year and the rather disappointing Air Show in 1998, this year's Mildenhall Air Fete has the potential to be very good. The 2000 show is apparently under the guiding hand of new organisers and whilst I am always a bit sceptical about early aircraft participation information, I thought I would pass on what I know.

Initial reports that have reached me sound very interesting. I am told that it is hoped that over 30 air-arms may participate. If this number is accurate then this represents a significant number of air-arms from outside NATO.

The web site indicates that all the usual participants are expected including F-117A, B-2A, B-1B, B-52H, etc. The word locally is that it is hoped that the F-22A Raptor will be present, presumably flown in by a Galaxy.

Also, there is a possibility that a Boeing V-22A Osprey will arrive to take part before deploying to Boscombe Down for several weeks of flight trials and then appearing at RIAT 2000. The official Air Fete web site is:

www.mildenhall.af.mil/airfete.htm



London Military

Steve F has also written to me with some London Military information which ties in with last month's column. He confirms the new frequencies I listed last month and also raises a couple of questions.

Steve reports that he has heard 255.925 being tested as London Military but I have no record of this frequency. Could it be a new discrete frequency? Has anyone else heard it in use? Your comments would be appreciated.

Since last month's 'MilAir' I have continued to listen out for 292.1 being used, but with no luck, and I am fairly certain that this frequency is not in use. 277.125 which was replaced by 278.075 and is now believed to be a standby or discrete frequency has been reported by two readers as being used by F-15s and Tornados for CAP. Thanks to **JC** and **Keith P**.

RIAT Cottesmore

Further E-mails and letters have reached me regarding the RIAT 2000 at Cottesmore. The move to this airfield seems to have provoked a considerable amount of discussion and I will use a few lines to answer the various queries.

As I understand it, most of the public parking will be off base with car parks opening on the Friday evening. The flying display aircraft are expected to operate from Wittering, which will cut down the photo opportunities on the arrival days. I am not aware if there is to be any form of photographic facilities at Wittering.

The frequencies in use at Cottesmore are as follows: Tower 370.05, 122.1 (NATO Common)/Approach 312.075, 340.575, 130.2, 123.3 (NATO Common)/Radar 358.725, 376.575, 262.9, 337.875/Ground 336.375. DATIS 242.325. Aircraft may also work Wittering Approach on 388.525.

The official web site for RIAT 2000 is: www.rafbfe.co.uk/2000 At the time of writing there was just a single page of outline information.

Fairhaven Radios

Bob has E-mailed me to let 'MilAir' readers know that he has started an Internet mailing list specifically for the Fairhaven range of receivers. The site will contain an exchange of various information relevant to these receivers. The site can be found at http://www.onelist.com/community/Fairhaven_radios

Our photograph this month is a US Marine Corp EA-6B arriving at Air Fete 97.

Lakenheath

Following up on my previous comments regarding the changes to Lakenheath Radar frequencies, I have been sent some additional information that there was a change round of the studs in mid January. Reported so far have been 315.575 (11), 259.05 (12) and 327.9 (14). Thanks to Martin, Rob and Owen.

Propagation Forecasts

How to use the Propagation Charts

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

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

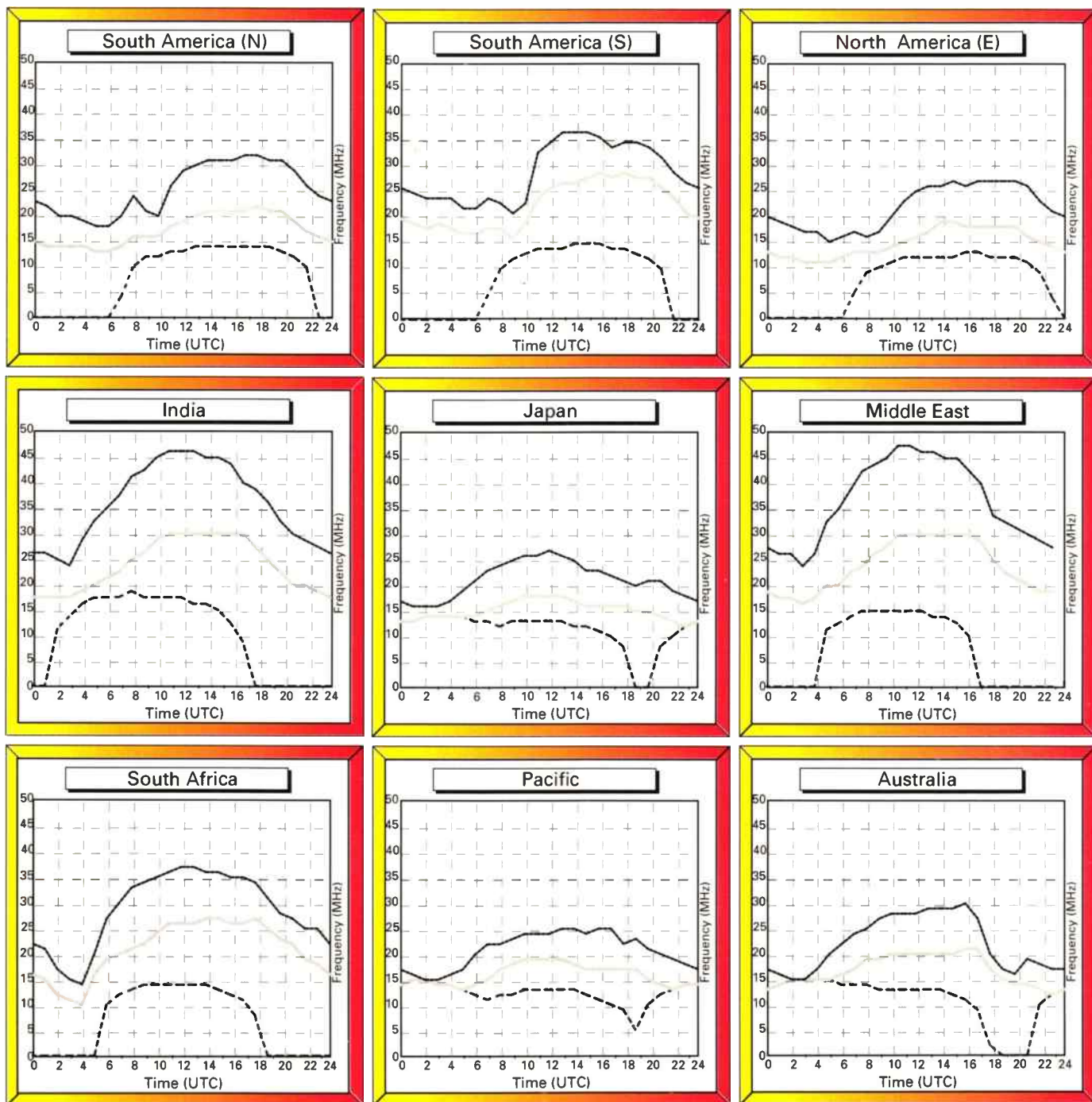
Lastly, the upper dashed line represents the maximum usable frequency (MUF), a 50%

probability of success for the path and time.

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

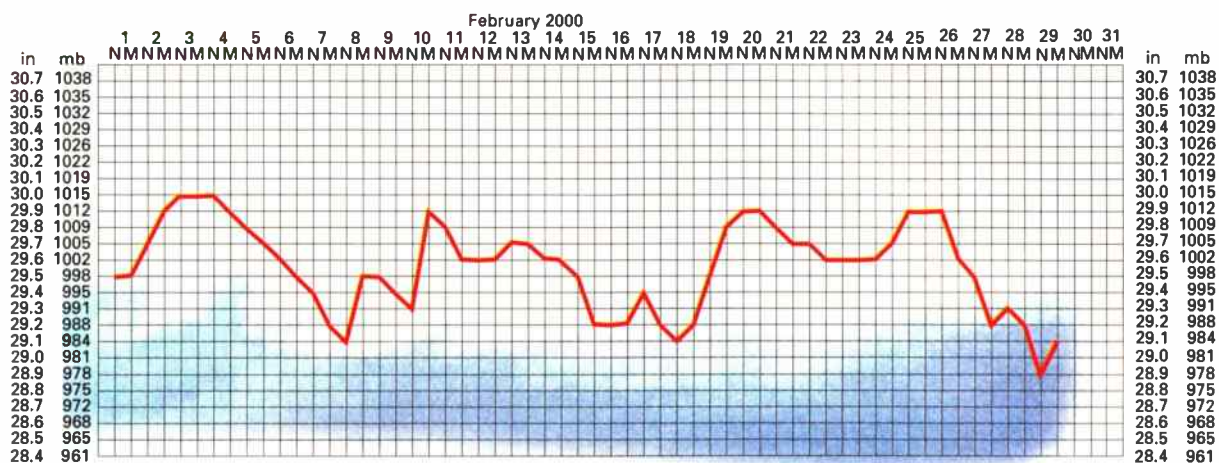
Good luck and happy listening.

April 2000
Circuits to London



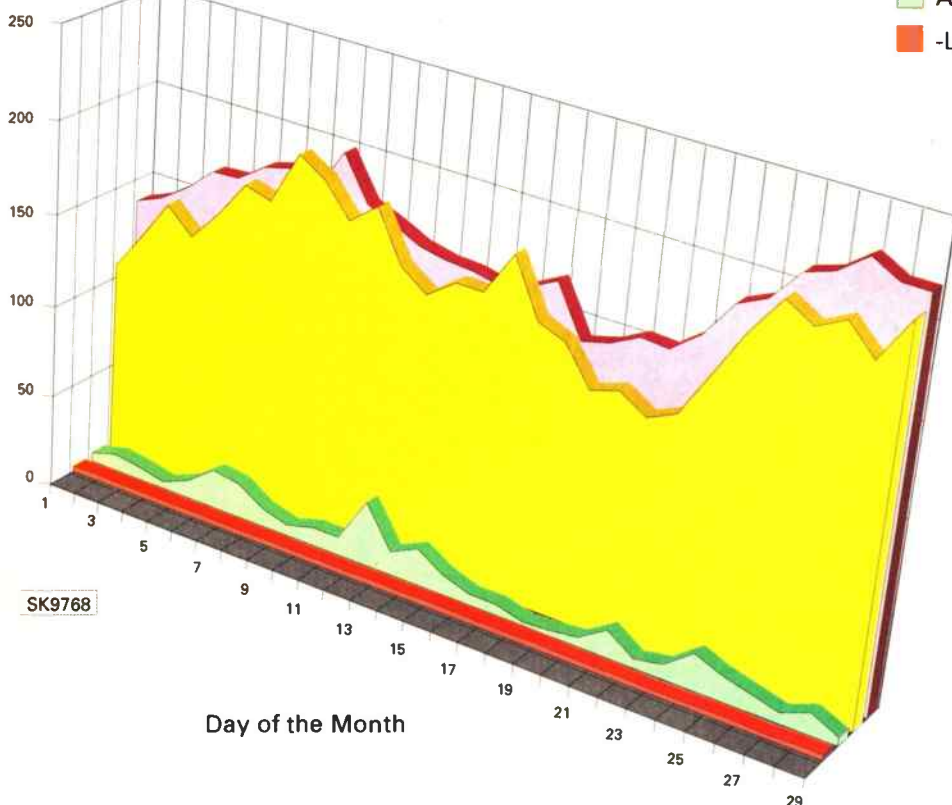
Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, February 2000.



February Data

- 10.7cm Flux
- Eff. Sunspot No.
- AP Index
- Log X-Ray



guide to the chart

The 10.7cm solar radio flux is used as an indicator of the general level of solar activity.

The K and AP indices are measures of geomagnetic activity.

The K index ranges from zero (very quiet) to nine (severely disturbed).

K values of five or greater correspond to geomagnetic storm conditions that can relate to poor propagation conditions.

The AP index ranges from 0 to 400. An AP of 30 is the threshold for geomagnetic storm conditions.

■ **GRAHAM TANNER, 64 ATTLEE ROAD, HAYES, MIDDLESEX UB4 9JE**

■ **E-MAIL:** ssb.utilis@pwpublishing.ltd.uk

SSB Utilities

SAR

First up this month is **Leslie Wilson** from Glasgow, who E-mailed me with some comments about some regular interference that he hears on 5.680MHz - the international SAR channel. He says that he often monitors 5.680MHz from his QTH and for several years has noticed that an interfering signal appears. It generates a warbling audio tone that slowly changes radio frequency but sweeps across 5.680 on a regular cycle.

Currently, this interference starts around mid afternoon (it is possibly transmitted continuously but becomes noticeable as propagation conditions change). Leslie says that he always suspected that a jamming station was at work, but I could not understand why, and has never heard any of the stations working the international rescue frequency make reference to this.

In early February, whilst listening to Kinloss RCC working with a Lossiemouth Sea King that was flying into Aberdeen/Dyce Airport with survivors from a fishing boat accident, the RCC radio operator made reference to the jamming and offered the aircraft an alternative frequency (5.699MHz) that was in the clear. Leslie asks is I have heard any reports of this jamming? It is annoying, but it never completely overpowers the legitimate users of 5.680MHz.

Well Leslie, these warbling interference signals have been present for many years, and they are usually used to force illegal transmissions to QSY to another frequency. I must admit that I have heard the warbling signals on 5.680MHz and several others, but I have never heard any of the illegal operations that they are working against.

It is a well-known fact that there are numerous clandestine radio broadcasts in the h.f. spectrum, and these naturally all want a clear frequency to reach their intended audience. One of these just happens to be 5.680MHz, although the Time Signal frequencies of 5/10/15MHz are also used.

There are two schools of thought on the origin of the warbling signal. It is either the legitimate users of the frequency attempting to get the clandestine station to QSY to another frequency, or it is a signal from a station trying to prevent the clandestine station from getting their message across. Whatever the case, these warbling signals are very annoying, not just for the assigned user services, but for listeners also.

An interesting exercise to try when you next hear the warbling signal is to check how far away from 5.680 you can still hear the signal. As I type these words, I am listening to a mixture of RCC Kinloss and warbling & jamming on 5.680, and the jamming covers up to about 5.684MHz.

However, when I track the jamming signal down in frequency, it comes and goes all the way down to about 5.630MHz. The only reason that I can think of for this is to force the clandestine station for go up in frequency - if they went down they would find more jamming and warbling.

Just one final comment - have you noticed how the warbling signal often disappears when the SAR services wish to transmit?

RAF VOLMET

An anonymous letter from Hertfordshire contains some information about an RAF installation near Dunstable which may be of interest to readers.

This is RAF Edelsborough, which can be found on the A4146 road if you wish to find it on a road-map. The Ordnance Survey map shows it as a mass of antenna masts, but does not give the site a name.

My anonymous contact reports that he was driving

past the site whilst listening to Radio 5, when his radio was swamped by breakthrough from very strong s.s.b. signals. He says that it is probably fair to assume that it was either Architect or RAF VOLMET transmissions.

This is the second time that I have been informed that this site is the source of the RAF VOLMET service, so I am going to stick my neck out and say that it is almost certainly the case. Having heard about somebody else's experience with this station, I plan to go and try the same for myself one day soon.

My anonymous correspondent wrote again a week later including a cutting from The Independent on Sunday dated February 6th 2000. The article concerns plans by BT to sell-off its site near Daventry (meaning the famous antenna site more usually known as simply Rugby), probably for either housing or factories.

The article reports that the site is home to an atomic clock (that must be MSF), and is also used for shore-to-ship transmissions (this is known to be a transmit site for BT Portishead Radio), and also air transmissions by the MoD. BTs contact with the MoD runs out in 2003, and is unlikely to be renewed, and with many services now operating via satellite links, the masts and antennas will be redundant.

The article does not expand upon what kind of MoD transmissions come from the site at Rugby, and there is certainly no mention of where the signals are prepared before transmission.

Anyone who has passed the site, either by train or by car on the M1 motorway, cannot fail to be impressed with the numerous antenna masts, antenna wires, guy-wires, and beam antennas. Every time that I drive past there, I keep wishing that I could attach my humble receiver to some of those giants, just to see what kind of signals I could hear. I wonder if one of the rotating log-periodic h.f. antennas would fit in my garden?

C-130J

Back in the February 2000 issue of *SWM* I mentioned the new C-130J Hercules which were being delivered to the RAF, and asked readers to let me know if they heard any ASCOT callsigns with 7000 or 8000 series flight numbers.

In January I received an E-mail from **Richard Cliff** in Devon who reported that he had seen a Hercules flying in orbits in his area, and when he managed to pick-up the aircraft on his scanner it was using a 7000 series callsign. Richard says that he was unable to positively confirm that the aircraft he heard was actually the aircraft he saw, but the aircraft did depart and he later heard it descending towards RAF Lyneham on his scanner.

Richard also reports hearing Ascot 7870 and Ascot 7872 working with London Mil on u.h.f. as they passed through the Lichfield Corridor.

Although these were also not seen by Richard, it does add weight to my theory that the new C-130J aircraft are using the 7000+ series of callsigns. One final logging by Richard concerns an Ascot 7130 which was flying circuits at Exeter airport during early February. This flight later returned to RAF Lyneham.

Would anyone like to add any more, especially if they can supply some SELCAL details?



C-130J.
Peter Bond.

■ KEITH HAMER & GARRY SMITH, 17 COLLINGHAM GARDENS, DERBY DE22 4FS

DX Television

The 21st Century didn't exactly commence with a bang as far as DX reception was concerned. The *Quadrantids* Meteor-Shower failed to produce anything of significance. By contrast, the log for January 4th, 1976, shows no fewer than 25 Band III entries on Channels E5/R6 (175.25MHz), with positive identification of Sweden and ARD from Germany!

A few minor Sporadic-E openings and a build-up of high-pressure resulting in tropospheric reception kept the interest bubbling along for the remainder of the month.

Reception Reports

A Sporadic-E opening to Scandinavia on the 9th produced signals on E2, E3 and E4 for **Ian Milton** (Ryton). Further activity occurred on the 21st during an opening to the Balkans with Slovenia and Croatia identified on Channels E3 and E4. Unidentified R2 signals from Hungary or Rumania were also evident.

Tropospheric openings occurred on several dates, but the 17th was the only day with reception from outside the United Kingdom. **Peter Barber** (Coventry) monitored signals from the Belgian transmitter at Wavre from 0800. Shortly after midday, a caption 'Infos, Au Jour d'hui' was seen via the Canal Plus network on Channel L9 from Reims. Sound was present too, so presumably the transmission was not encrypted.

Stephen Michie (Bristol) noted several Dutch, Belgian and French stations. From the north-west, Irish Band III signals were identified on Channels ID and IG from Mullaghanish.

During a lift on the 27th, **George Garden** (Edinburgh) noticed that his local Craigkelly transmitter and dependent relays were off-air between 0200 and 0600. This meant that many u.h.f. channels were clear and this resulted in reception from Pontop Pike and possibly the 100kW

Blaenplwyf transmitter in Wales.

Simon Hockenhull (Bristol) comments that F2 has become considerably quieter with the m.u.f. (maximum usable frequency) struggling to reach 29-30MHz most days. Conditions picked up on the 9th with unidentified weak co-channel signals on Channel E2 between 1150 and 1300. The frequencies measured 48.240 and 48.255MHz.

Summertime F2 Reception

Many European Band I transmitters have been received in Australia during December, which suggests that F2 reception is possible during our summer months. We mentioned this last summer after **Tim Bucknall** (Congleton) heard vision buzzes on frequencies corresponding to New Zealand and Australian vision carriers NZ1 and AO. Although F2 reception has always been considered a wintertime phenomenon, this latest evidence suggests that this is not strictly so.

It may pay to be extra vigilant on Channels NZ1 (New Zealand) and AO (Australia) during the coming Sporadic-E season, especially during Sporadic-E openings to Norway, i.e. roughly the same direction from which Australian and New Zealand signals arrive.

Incidentally, there appears to be a new transmitter operating in south-east Asia on Channel E2. It has already been received in the Netherlands and Australia. The Thai TV9 network has also been identified on Channel E2.

Mystery Test Card

Our first mystery of the 21st Century has been spotted by Stephen Michie. At 1206 on the 12th, a test card fluttered up on Channel E4. It was circular and resembled one of the monochrome electronic test cards of the late Sixties, such as the PM5540 or the old Icelandic/German type. At first, Stephen thought it may have been 'NRK Nordland' but that particular test card takes on a rectangular appearance, rather like the FuBK. Two likely contenders for this mystery test card are featured this month.

Talking of test cards, the Dutch NED-3 network radiates a 16:9 version of the PM5544, confirmed by Stephen Michie. However, **Peter Barber** noticed that the 16:9 PM5544 has been removed from the morning schedules of Belgian networks VRT TV-1 and RTBF-1. The general format of the test transmissions, which feature programme trailers and text pages, has been 'toned down' to give the transmissions a softer and more friendly approach.

Transatlantic Cordless 'Phones

Recently, **Roger Bunney** (Romsey) had F2 reception up to 42MHz across the Atlantic, with lots of US communication signals although most never mentioned the town. A good catch was on 37.221MHz with a cordless 'phone interrogating an answer-phone machine. There was a mention of Denver, but the power levels must have been minute!

Also an Italian was calling CQ DX in the



Fig. 1: Roger Bunney's chimney-mounted wideband crossed-dipole array for Band I DXing. The dipoles can be switched individually to select the required direction.

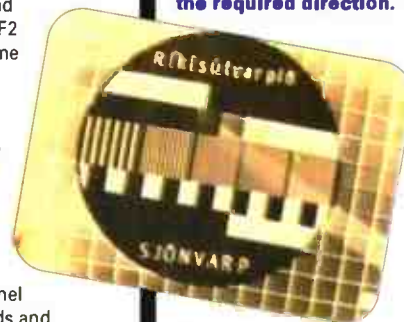


Fig. 2: The electronically-generated test card used for many years by RUV in Iceland.



Fig. 3: The distinctive clock caption radiated for many years by RUV.



Fig. 4: The PM5540 electronically-generated test card. This particular version was used by the IBA in Israel and includes their logo in the lower left-hand corner.

January 2000 Reception Log

This month's logs have been supplied by Stephen Michie, Simon Hockenhull and Ian Milton. All times shown are in UTC. Abbreviations: MS (Meteor- Shower), SpE (Sporadic-E).

Day	Log
2	0706 E3 Unidentified pictures via MS.
3	1125 E2 TVE-1 (Spain) via MS/SpE.
4	0742 E3 NRK-1 (Norway) or SVT-1 (Sweden) with PM5534 test card via MS.
9	1150 E2 Unidentified co-channel signals via F2. 1305 E2 NRK-1 via SpE. 1305 E3 YLE-1 (Finland) via SpE. 1340 E4 SVT-1 (Sweden).
10	0614 E3 DR-TV (Denmark) with PM5534 test card via MS.
11	0741 E3 Unidentified pictures via MS. UK tropospheric reception (TV and FM).
12	1205 E4 Mystery test card (see column). 1215 E4 Unidentified pictures via MS. 1228 E4 NED-1 (Netherlands) via tropospheric scatter.
16	UK tropospheric reception (TV and f.m.).
17	Tropospheric reception from the UK and abroad:- Netherlands: NED-1 E5 and E29; NED-2 E27 and E32; NED-3 E30 and E35. Belgium: RTBF-1 E8; VRT TV1 E10. Éire: RTE-1 ID; Network-2 IG (both Mullaghanish). France: Canal Plus L5, L7 and L9; Unidentified u.h.f. signals on L35 and L52.
21	1135 E3 SLO-1 (Slovenia) with subtitled film via SpE. E3 Unidentified Cinemascope film via SpE. E4 HRT-1 (Croatia) programme via SpE. R2 Unidentified programmes (probably Hungary) via SpE.
22	1003 E3 Unidentified pictures via MS (also at 1025 and 1034).
25	1144 E4 Unidentified pictures via MS. 1215 E3 Unidentified pictures via MS.

31MHz cordless telephone band - they must also use this band as Italians have been heard using this type of 'phone. In fact, **David Bocca Corsico Piccolino** (Italy) confirms this.

There is a cordless telephone available called the Citizen TF500 which operates between 31 and 40MHz. It is non-approved and is on sale for around 100 Euro. Other telephones that are popular operate in the 46-49MHz region of Band I and come from the USA. They are approved by Telecom. Some have a booster providing 5-10W via a ground-plane antenna.

Digital Audio Broadcasting

One subject which has had little airing is DAB (Digital Audio Broadcasting). Signals have been broadcast from many main transmitters for some time now, but with receivers costing the Earth (if you can find one, that is). No wonder DAB is slow getting off the ground.

Unlike digital TV, where frequency sharing with existing analogue transmissions exists thus creating possible interference, DAB wallows in its own little frequency spectrum at the upper end of Band III. This is unlikely to be a problem with TV DXers since European TV stations have now been kicked off Channel E12 and despatched into the u.h.f. spectrum.

As with analogue TV, a death warrant has been issued and f.m. broadcasts will disappear within a few years, thus making your current TV and radio tuners fit only for the rubbish dump.

What will DAB offer? Clearer sound so you can hear all the four-letter words which are liberally scattered throughout all BBC radio stations? Well, that is just one of the promises, but doesn't an f.m. broadcast already sound clear and impressive enough?

There are very few places in the UK where f.m. signal levels are a real problem. Maybe we are in for a fiasco like digital TV broadcasts where the sound will mute once the

signal falls below the threshold or 'cliff edge', namely the minimum level at which the decoder will respond and once below it the sound disappears.

Regarding availability, Simon Hockenull (Bristol) advises that the Arcam 800 tuner had an enthusiastic review in a recent hi-fi magazine, coming out with flying colours. It appears that the bit-rate for high-quality sound is 96kbit/sec per channel as used by the BBC for Radios 1, 2 and 3 with the quality equalling that of a good-quality f.m. tuner fed with a generous amount of signal.

Strangely, Classic FM only uses 80kbit/sec per channel and the difference, or deterioration, is very noticeable. Mono broadcasts, using only 64kbit/sec, sound awful.

So there we have it. DAB seems to equate to more expensive equipment and, as with digital TV pictures, there is no improvement over a good-quality analogue signal! Perhaps DAB should stand for 'Diabolically Awful Broadcasting'. Does anyone have comments on DAB transmissions?

Keep On Writing!

Please send your DXTV, slow-scan TV and f.m. reception reports, news, off-screen photographs and information to arrive by the first of the month to:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS.** We can also use off-air pictures stored as JPG files on PC disks.

Fig. 6: This month's visit to the 'Down Memory Lane' zone. Does anyone remember this ITA tuning caption used in the late Fifties and early Sixties?



Fig. 5: An example of slow-scan TV (SSTV) received by D. Heaton G3YSV in Bradford and sent to us on a PC disk as a 'jpg' file. He has been interested in various radio-related topics ever since 1934!



Timestep



PROsat for Windows is used by most leading weather satellite enthusiasts. They have grown up using Timestep products and now rely on the superior image quality and ease of use provided by PROsat for Windows. Features such as real time reception, auto-scheduling, temperature readout, totally automatic reception of all NOAA's and Soviet satellites and automatic animation have made PROsat the preferred package. Satellite profiles allow individual adjustment of synchronisation and input levels, giving unrivalled automatic or manual reception of even "difficult" satellites. Geostationary satellites are well covered and include METEOSAT, GOES, GOMS, GMS and even INSAT. All images can be in colour and because this is a full 32 bit Windows application it will work perfectly on Windows 95-98-NT4.

Our receivers are known throughout the world, 2,500 users cannot be wrong ! We can provide a single part or a complete system. Timestep are regarded by EUMETSAT and NOAA as prime suppliers of equipment and we have USA FCC approval as well as European CE approval. As a testament to our quality we are, we believe, the only weather satellite manufacture who has the prestigious ISO9002 quality award.

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■ E-MAIL: info.orbit@pwpublishing.ltd.uk ■ WEB SITE: <http://www.itchycoo-park.freeserve.co.uk>

Info in Orbit

By mid-February, the increasing amount of sunlight manifested itself one Saturday evening (12th) when the Russian weather satellite (WXSAT) *RESURS 01-N4* started transmitting late in the evening - 2120UTC. It was on its north-bound pass over Britain and had just crossed Iceland when its signal on 137.85MHz locked my receiver. The image was blank - but I did not require a decoding system to know that! Just hearing the tone was encouraging - like seeing the first snowdrops of the year!

Geoff Perry MBE - An Appreciation

It was **Max White** of the Kettering Group who passed on the very sad message that Geoff Perry died suddenly on 18 January. I first heard about Geoff's work sometime back in the 1960s or early 1970s, while working at the Radio and Space Research Station at Slough.

Pierre, a friend and colleague of mine, sometimes spent a few hours with me identifying satellites as they crossed the sky. I am sure that it was Pierre - the leading light in the Satellite Predictions Group - who first mentioned Geoff Perry. Geoff was a physics teacher at Kettering Boys' Grammar School, and to demonstrate the Doppler effect, in which the source of a fixed frequency moves in relation to the observer, causing an apparent frequency change, he showed pupils the effect of tuning to satellite frequencies.

I contacted Geoff Perry during the mid-1980s when I had built a weather satellite receiver and was decoding METEOR images. A local radio ham referred me to RIG (the Remote Imaging Group) that was then in its infancy, and the articles in the magazine reminded me of Geoff Perry's work.

At that time (I still have my notes somewhere!) there were a couple of METEOR WXSATs transmitting, and each showed a different image format. I sent him a letter asking about METEOR telemetry and he kindly sent a diagram showing how the edge code was decoded. This is binary data, represented as black-and-white columns along the edge of METEOR images. I was amazed with this because having spent so many years in professional satellite operations, using multi-million pound computers and tracking systems, here was a person who had done this himself (within the Kettering Group) using everyday equipment, plus a highly perceptive and analytical mind. Some close associates of Geoff kindly provided personal memories:

Dave Woods: Geoff was first and foremost an educator. His whole entry into the field of spacecraft telemetry monitoring and deciphering came about as a 'simple' demonstration of the Doppler effect using satellite signals. It was only after they began to notice structure to these signals that he began to delve into their content and purpose. As each new launch occurred, it would be



Fig. 1: Geoff Perry 1979 in Kettering Grammar School - picture courtesy Sven Grahn.



Fig. 2: NOAA-14 20000UTC on 5 February 2000.

assigned to one of the students as a project. One of those routine assignments was for Andy Driver to monitor *Cosmos-954*. It soon became obvious that it was one of the radar ocean surveillance satellites that would dump the main spacecraft body and boost the power source reactor core into a higher, 'safe keeping' orbit at the end of its mission. When that reboost failed to occur, that began the saga that ended with the re-entry over Canada, and an extensive search for radioactive debris from the spacecraft. I had the pleasure of working briefly with Geoff when he worked with Marcia Smith and others at the Library of Congress on that big three volume project on the Soviet Space Program back in the 1980s. Geoff told me that Andy had died in a tragic incident, and that it disturbed him deeply that so promising a life for one of his students had ended so suddenly. He cared very much about all of his students, as can be seen from all of the work that came out of the Kettering School. When my daughter had an opportunity to do part of her student teaching at a school in England, Geoff was the first one that I called for information and advice. He was an amazing individual, and it was an honour and privilege to have known him over the years. He will certainly be missed.

Programs & The 'Millennium' Bug

By mid-January, reports were coming out nearly every day concerning Y2K problems with tracking programs, particularly as they reacted to new Kepler elements released by the Orbital Information Group. OIG itself issued element sets with epoch dates in the future and some programs failed.

With one or two exceptions, software authors issued 'fixes' and all was well. The only program that I believe remains Y2K incompatible is *PC-Track* (version 3), a program issued several years ago, whose author has not been contactable since around 1995. I tried to register the program at that time but the author could not be located.

Meanwhile, credit to authors who updated their freeware programs. A few of those in common use are mentioned here. Some popular programs (such as Timestep's *TrackIt*) were originally issued with Y2K compliancy, so are not listed.

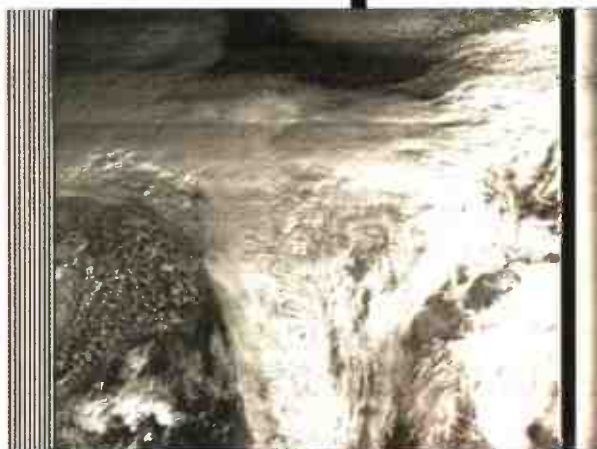


Fig. 3: RESURS 01-N4 1251UTC 4 February 2000.

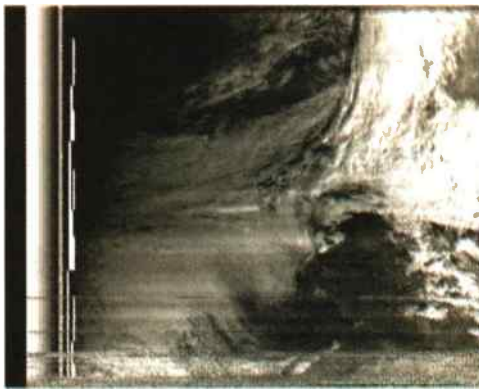


Fig. 4: METEOR 3-5 0855UTC 14 February, prior to terminator entry.

Footprint Update

Les Hamilton's freeware satellite tracking program *Footprint* was revised in January and he recommends users to make certain that they update to *Footprint* v1.15 (or greater) before 31 December 2099 to avoid the problem recurring next time the century rolls over!

Instant-Track would not update its Kepler data after 1 January 2000. This has been fixed with the release of a patch and new version 1.5. Those with Internet access may be able to collect the new version,

when available, from AMSAT's web site:

<http://www.amsat.org>

WINORB would not read post-2000 Kepler data, but a new version is expected, refer to AMSAT's site for availability, or its home page: <http://www.sat-net.com/winorbit/index.html>

Kepler Elements - The Background

Several people noticed a change in the new Kepler elements issued at the beginning of January. The third set of figures in the first line of each data set is a day of year (the Epoch), so would be expected to be of the form 00 (representing the year 2000) immediately followed by the day of the year (for example 043) with a decimal point and numbers representing a seemingly random time of day. In fact, the elements took the form of a decimal point followed by a string of zeroes!

```
NOAA 14
1 23455U 94089A 00043.00000000
.00000354 00000-0 21785-3 0 2212
2 23455 99.1254 18.8996 0010323
83.4984 304.0861
14.12164543263797
```

Dr. T.S. Kelso maintains one of the most useful sources of Kepler elements on the Internet, and to explain the background to this change, he kindly provided an explanation which I quote here in full:

"Let me begin by saying that there is absolutely nothing wrong with these element sets. There is nothing in the definition of the NORAD two-line element set format, or the corresponding SGP4 orbital model, which requires that the epoch be at or near the orbit's ascending node. In the past, NORAD followed a convention of generating element sets this way, probably because it made it easier to 'visualise' the orbits of many satellites. It would appear that NORAD has decided that approach offers little advantage in today's environment of high-speed computing and actually degrades the accuracy of the data.

"The problems people have been reporting are due to applications which incorrectly assume that the epoch must be at the ascending node. If your application is producing inaccurate results with these element sets, it is a good indication that it is not using the SGP4 orbital model (which is required for the most accurate predictions possible with the two-line element sets). If this is indeed the case, you should be wary of the results your application is producing. In fact, if these applications are 'still working' with other satellites, it is because these element sets are still being generated with epochs near the ascending node - something which could change at any time (and may not be as easily detected).

"The bottom line is this. There is no problem with this choice of epoch as the two-line element set format is defined and used within the SGP4 orbital model. To get accurate results with these data, it is absolutely necessary to use the SGP4 orbital model (which was used to generate the data). If your application does not work, it is not using the correct orbital model and you should immediately bring this matter to the attention of your software provider. I hope that helps to resolve some of the questions surrounding this change".

Dr. Kelso's site can be reached at:

<http://www.celestrak.com/NORAD/elements/index.html>

WXSATs - Anomalies?

David Brooks is in Barbados (location 13.1°N 59.5°W) and recorded what appears to be an unusual image from *NOAA-14* at 2000UTC on 5 February. At this time, the *WXSAT* was on its normal north-bound early afternoon pass, transmitting visible-light/infra-red images - or at least should have been.

David received **Fig. 2** from *NOAA-14* around 4p.m. local time (2000UTC), clearly showing that the image did not switch to visible mode until it had just passed the 20th parallel. David notes that the sun's elevation was around 25°, so it was still bright and warm in the tropics. *NOAA-14*, near 52° elevation and 275° azimuth, was slightly more west (and therefore nearer the sun) than his location in Barbados, yet there was no visible image over his area.

At the time of the pass, David was not particularly listening, but he noticed the change in signal which one expects during the late evening passes from *NOAA-15* or *-12*, so he checked, only to see this unusual image. He wondered whether others might have noticed this unusual phenomenon - he has not had his system on continuously for some weeks because outside the hurricane season he feels that there are few significant weather systems. Those monitoring the 'rig-I' *WXSAT* mailing list (on the Internet) may have noticed occasional comments about possible *NOAA-14* channel switching anomalies.



Fig. 5: NOAA-14 infra-red image 0851UTC 12 February from Hendricus Luijckx.

Fig. 6: METEOSAT-7 7 February 1204UTC PDUS image.

RESURS Anomaly?

On 29 January *RESURS 01-N4* stopped transmitting a.p.t. (*WXSAT* images) on 137.85MHz and provided no more than a continuous tone during daylight passes. I have not seen any official comment on this event. However, on 4 February, normal telemetry resumed - see **Fig. 3**.

My speculation is that some commanding of the equipment on-board the satellite might have been taking place in an attempt to resurrect one or more of the failed



Dust continues to blow off the west coast of Africa over the Atlantic Ocean.

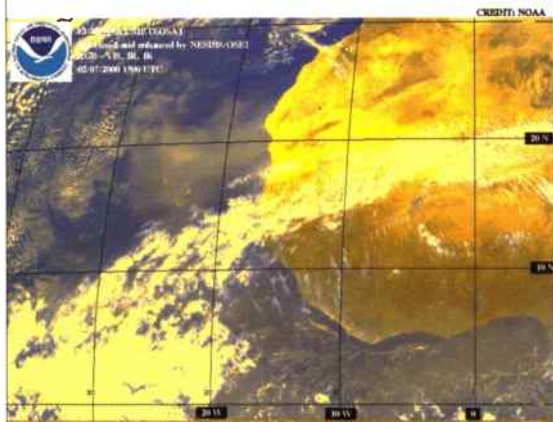


Fig. 7: METEOSAT-77 February 1500UTC.

systems. Whatever the reason, RESURS resumed transmissions within days of METEOR 3-5's approach to the morning terminator and a probable spell of silence during the few weeks of low solar illumination that it regularly experiences.

NOAA-9 Transmissions?

Something transmitting on allocated frequencies for NOAA WXSATs was causing a few headaches. Some weeks ago I identified two unexpected transmissions, apparently coming from NOAA-9 - a once-active WXSAT.

The transmissions on 136.77 and 137.50MHz (non-APT format) would not normally be 'heard' by a WXSAT receiver because the latter normally locks to the a.p.t. (2.4kHz) sub-carrier and none is present in this telemetry. The lower frequency carries (what is called) TIP data - the upper frequency is that used by NOAA-15 - the prime morning satellite.

When active, NOAA-9 originally transmitted a.p.t. on 137.62MHz, so the observed frequency does not match. The problem is likely to be a temporary one.

New USA Polar Images

Hendricus Lulofs has recently started providing daily images from NOAA WXSATs covering the eastern coast of



Fig. 8: Lunar eclipse 0422UTC, 21 January from Plymouth.

Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz.
 NOAA-15 transmits a.p.t. on 137.50MHz.
 NOAAs transmit beacon data on 137.77 or 136.77MHz.
 METEOR 3-5 transmits on 137.30MHz in sunlight.
 OKEAN-4 and SICH-1 use 137.40MHz for brief transmissions.
 RESURS 01#4 transmits a.p.t. on 137.85MHz.
 METEOSAT-7 (geostationary) uses 1691 and 1694.5MHz for WEFAX.
 GOES-8 (western horizon) uses 1691MHz for WEFAX.

Shuttle Launch Schedule

Plans for near-term Shuttle missions were revised at the end of January due to International Space Station assembly considerations.

Date	Mission/Vehicle	Payload
13 April	STS-101/ <i>Atlantis</i>	ISS maintenance/Assembly Flight 2A.2a
unknown	ISS-1R/ <i>Proton</i>	Zvezda service module/Assembly Flight 1R
unknown	Possible STS-106/TBD	ISS Zvezda outfitting/Assembly Flight 2A.2b

Whether or not the extra flight of STS-106 will be required (and any necessary adjustments to the target launch dates for subsequent Shuttle flights) will be dependent on the launch date scheduled for Zvezda. A launch date for Zvezda is expected to be selected following an International Space Station Joint Program Review to be held shortly.

A comprehensive listing of all Shuttle flights and payloads, together with associated information is available from me, at the address at the head of the column, as the *Shuttle Pack*. Please include £1.50 and stamped s.a.e. for the A4 booklet.

America. Figure 5 is an infra-red image received during an early morning south-bound pass. His Internet site address is:

<http://home.maine.rr.com/satellite/satellite.html>

Dust From Africa

Most days I try to remember to collect the unencrypted mid-day, whole-disc, visible-light PDUS image from METEOSAT-7. Usually I do not notice any particular weather features on the image, but I always save a JPG (a compressed image format) version for future reference.

More than once I have subsequently heard about some interesting feature on a deleted image - hence my caution! The Daily Operational Significant Event Imagery Report is issued every 24-hours on the Internet by the OSEI team, and frequently lists weather events - such as volcanic outpourings or severe snow storms.

On 7 February there was a notification of a large amount of airborne dust flowing off the coast of western Africa and over the Atlantic Ocean and becoming caught in a weather system. My own PDUS image - see Fig. 6 - does show the feature quite well - if you know it is there! Meanwhile, the OSEI's image - see Fig. 7 - added colour, and therefore clarity, making the dust flow show very clearly.

Lunar Eclipse

Although almost all of Britain was clouded out during the early hours of 21 January, a few gaps in the cloud cover enabled me to capture several dramatic pictures of the total eclipse of the Moon. WEFAX images from METEOSAT-7 were invaluable for providing clues about the timing of short, clear spells. Helping with astronomy is my most important application of WXSAT images.

Kepler Elements - WXSATs, MIR and Shuttle

- 1 If you want a computer disk file containing recent elements for the WXSATs, AMSATS and others of general interest, together with a large file holding elements for thousands of satellites please enclose 50p with a PC-formatted disk and stamped envelope. A print-out identifying NASA catalogue numbers is included. The disk file is ideal for automatic updating of tracking software.
- 2 I also send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (secured, plus four self-addressed, stamped envelopes) for four editions. Transmission frequencies are given for the operating satellites. This data originates from NASA.

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Scanning

Bugged!

Well, spring has sprung and I wonder whether any of you were bitten by the millennium bug. The ancient gear here was unaffected so it looks as if I have got away with it anyhow. But that doesn't mean that you are not bugged!

Firstly, the thing to remember when scanning is that not all the transmissions you hear will be legal (more of this later). Certainly if you do hear anything that sounds like a normal conversation or background noise type sounds then you are probably listening to an audio surveillance device or bug. Remember that most people actually bug themselves.

These baby monitors that operate in the 49MHz region are a prime example of people just not realising that the box in the tot's bedroom is actually a transmitter capable of covering a fair proportion of the local area. Likewise, if you use an analogue portable telephone then you are in fact bugging your own 'phone.

Assuming you ignore these diversary transmissions and the baby crying, all other bugs that you will actually hear have been planted on purpose to gather intelligence. Quality of equipment varies. The authorities and professional surveillance operatives are going to use spread spectrum devices or other gear that the average 'scannist' will just not be able to pick up.

Now *SWM* is an informative hobby publication and is not intended as a correspondence course for intelligence officers so I shall limit info on bugging to what we can reasonably hear. Trawling in and near the f.m. broadcast band will unearth the simplest devices operating from a free running oscillator. These small units have been sold by the thousand in the UK to anyone prepared to pay over the odds for a cheap transmitter hidden in a multi socket plug or a TV remote control or whatever.

Another hobby magazine printed a p.c.b. design for a device of this ilk some years ago. The frequency that they operate on is generally determined by the length of antenna wire you tack on the printed circuit board, but they usually operate in the 88 - 108MHz region w.f.m. The same design can also be powered from the 50V d.c. 'phone line and be switched on as soon as the target 'phone is lifted off the hook.

Then we have the more expensive crystal controlled stuff. Looking through your *UK Scanning Directory* you occasionally will notice a frequency tagged as an 'Illegal Bugging Device'. Quite often these can be found in the aircraft band on v.h.f., but unlike aviation frequencies, the bugs are n.f.m.

I have one here which presumably cost a fortune when new and is built into a Parker pen. This unit is on 135.480MHz n.f.m. The pen actually used to write as well. It's a well made piece of kit and I believe it runs on a tiny 12V battery, but I don't have a clue what type as I've never had it running.

Many devices at this end of the market transmit in the 399 to early 400MHz range. These items can also be built into almost anything, i.e. calculators, wall sockets, etc. The manufacturer of these units can often be identified by the frequency on which they operate.

I have to labour the point that if professionals are doing their job correctly then you will not hear what is going on as they'll be using spread spectrum, digital techniques or something equally evasive. I have even seen secure transmitters that look like a piece of plaster and a small nail.

There are companies of varying quality selling this gear and expect to pay a **great deal of money** for high end equipment from CCS or PK Electronic. Conversely, a number of manufacturers make equipment to detect these gadgets. The best known of the UK companies is probably Audiotel International Ltd. of Corby, Northants, who make high-end counter surveillance equipment and have world-wide custom.

I still have one of their old Scanlock 2000 machines and I am told that there are many of this type still in use throughout the world, although they make much more modern detection devices these days. Other audio surveillance kit is not radio based but audio based and may include endoscope microphones, parabolic dish mounted directional microphones and other exotica.

Although people who drive vehicles for a living are known as drivers and those engaged in the occupation of cleaning are called cleaners, people who bug locations are actually 'buggists'. I just thought I should clear that up for you.

That's enough on this subject. I don't want anyone to become paranoid and lose sleep because of what I've written.

Illegals

I mentioned earlier that you may hear other illegal transmissions. I have recently heard fishing boats using 2m band amateur frequencies. A number of game shoots have also been sold 2m kit by unscrupulous traders and woe betide any amateur who puts out a call when they are on. Quote from a **very** superior male voice, "Get off my radio. I want my ghillie. You're not my ghillie". And this on the amateur calling channel!

Listening through the bands though it will be hard to differentiate between legal and illegal operations, especially if a normal type of business is being conducted on air. A large number of second user hand-held radios are in circulation and you can bet that most of them are unlicensed, especially the single frequency simplex units.

It is amazing what you may hear on v.h.f. and u.h.f. simplex frequencies if you were to listen. A lot of them have been purchased by private detectives and folks involved in other information gathering.

As an example, three years ago two gents of my acquaintance were arrested in a European country and jailed for allegedly burgling a government office there. In their possession were two Phillips PF85 radios on a frequency that was issued to a London Cathedral, amongst other users.

These radios had been offloaded to the second-hand market by their original owners and sold on. The authorities in this foreign state held on to the PF85s, which is a shame because I heard that they worked very well indeed and anyhow the desk charger was a 240V unit and I doubt it would be much use to the folks who confiscated it.

Also, please remember that as encrypted radios become more widespread there will be more of them turning up on the second-hand market. These will also be purchased by users who value their security and will be used. I know that a military unit have recently moved premises and were having a clear out and came across some virtually unused encrypted Pye/Phillips PFX radios. These were sold to invited dealers and are now in the public domain. I am told they are as new. I wouldn't mind some myself come to think of it.

SCANNING



A range of counter surveillance products that Audiotel International Ltd. produce.



A chap using a 'broom' or non-linear junction detector.

If you have any comments (of any type) or you have heard anything of interest or want any further information on points outlined here then get in touch with me at *SWM*, either by E-mail or post and I shall obviously do my best to help.

Don't forget that no-one will thank you if you jeopardise any law enforcement operation, rescue or other lawful activity by engaging in the scanning hobby. We know what is legal to monitor and that isn't much. So let's be careful out there, as the sergeant on the *Hill Street Blues* TV programme would say.

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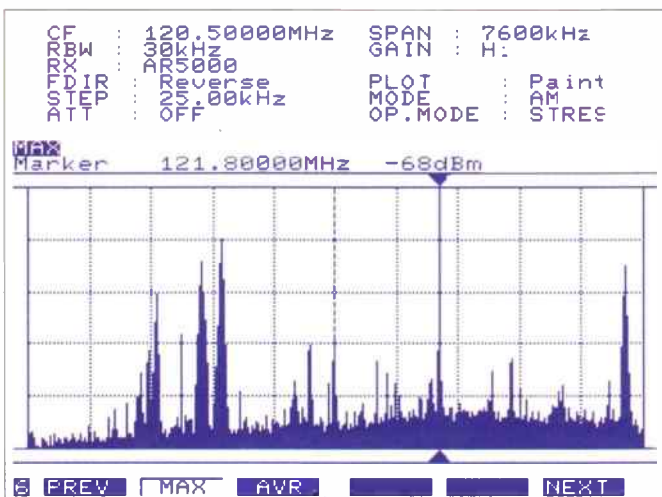
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AR5000 IC-R8500
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The SDU5500 supports a number of AOR and ICOM receivers, see above. In addition, the SDU5500 may be used with other receivers which offer a 10.7 MHz I.F. output with suitably wide bandwidth, please refer to the colour leaflet for details. Various enhancements have been implemented over the earlier SDU to provide even greater functionality and professionalism. **Free internet download software** for the PC Windows operating system is available from our UK web site <<http://www.aoruk.com/firm5500.htm>> **£869**

Commercial and government organisations are selecting the AR5000 and SDU5500 every month. The combination is so successful that in many cases it is being singled out for implementation or consideration as their 'standard kit'!



As reviewed in the December '99 edition of *Short Wave Magazine*

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New products will soon be announced, photographs and specifications are being prepared but will not be in time for this advertisement print date. However if you have internet access, the latest information will be available from our UK web site by the time this issue of SWM arrives with you, log on to www.aoruk.com to check out the details.

It's well worth having a look through our UK web site as there is much more than basic sales information to view, specifications, download operating manuals for current and older models, technical bulletins, modifications, tips, FULL software packages for several models with demo versions for others... the free AR8200 software now features support for GPS connection on a second serial port so that graphical location may be saved along with frequency, date, time, sound log etc. The short wave listeners guide by Bob Ellis provides monitoring tips, propagation information, frequency listings and an Excel (MDB format) data base frequency listing. Bob's short wave column archive is also available to look through along with tip of the month and much more. There are many links to other sites, dealers, distributors, software links etc. We are always happy to answer queries at our e-mail address of info@aoruk.com If you do not have access to the internet, please give us a call by phone on 01773 880788, we can provide leaflets and support on the AOR product range.

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Decode

Real Ale!

Nice thought, but this isn't about beer! No, ALE is at the heart of a revolution that's taking place on the h.f. bands and transforming the way h.f. links are used. Let's start with a bit of history to help get things in perspective. In the early days of h.f. radio the radio operator was the key to making the systems work. Not only did the operator often need to carry-out running repairs but he or she also had to decide which frequency to use and then use a high level of skill to reliably read Morse code at 25-30w.p.m.! Not surprisingly, good radio operators were at a premium and this was regarded as a very highly skilled and essential job, especially for ships at sea where the radio operator provided the only link with the outside world. As time has gone by, technology has gradually eroded the requirement for this essentially human skill. Major advances, like the SITOR systems that provided error corrected teleprinter links, have made Morse code largely obsolete in the commercial world. This is now backed-up by sophisticated satellite systems that enable people to communicate from just about anywhere on the planet. With all this change, the poor old h.f. link was starting to look rather more like a liability than an asset. However, technology has come to the rescue and given our much loved h.f. links a new lease of life.

Probably the greatest weakness of the modern h.f. radio link comes from the variability of propagation. You will, I'm sure, have noticed that band conditions can and do vary from day-to-day with a whole stack of unpredictable elements contributing to this variation.

Selecting the best frequency for any given link is a skilled job that even the experts can get wrong.

Fortunately, for h.f. fans there is now a great solution available that completely automates the process of choosing the best h.f. link. The system is so good that it operates in real-time and

can seamlessly change links even if one starts to fail. So what is this system? It is Automatic Link Establishment, or ALE, which is where we started.

The system has been designed with the commercial and military markets very clearly in mind and is being taken very seriously. An example of this can be seen from papers produced by the US SCOPE Command, which is a body responsible for planning the comms infrastructure for the USAF. They have reported that they are modernising their ageing h.f. systems that were installed in the 60s and 70s and replacing them with the latest commercial equipment fitted with ALE equipment. This will allow remote

selection of the operating mode, antennas, etc. and the ALE system will automatically ensure that each message is sent over the most appropriate link. There is also a Shares Resources programme (SHARES) that's used by many federal agencies for disaster recovery and other emergency situations. This network also makes extensive use of ALE to ensure best use of all the available links.

Under The Bonnet

Let's take a look the ALE system to see what it does and how it works. One of the secrets to its success lays in the way the system has been designed to be easily added to just about any radio system. The signalling systems used for ALE units to communicate over an existing link use audio tones in the range 750Hz through to 2500Hz so can easily pass through the audio stages of just about any transmitter. The signalling system is slightly unusual as it uses an array of eight tones each spaced by 250Hz and 8ms in duration. Each of these tones is used to represent three bits of data giving an overall data rate of 375bits/second. I won't go into the nitty-gritty of the code here, but suffice it to say it has been designed as the best choice for this situation.

Once you have a network of transmitters and receivers fitted with ALE links you can program the system to continually monitor all the links and keep a record of the performance. Let's look at an example of how two stations would communicate when they try and link-up. First of all the originating station will transmit a 'call' frame of data. If the receiving stations hears the 'call' it will send a response addressed to the originating station. To complete the cycle the originating station now needs to send a further acknowledgement to the receiving station to complete the three-way confirmation or handshake. Once this is complete, the ALE system has established that there is a good and usable link between the two stations. This process can be extended to operate over a whole network of transmitting and receiving stations where they will constantly check that they can hear each other.

An even more sophisticated extension of this is to be found in the Link Quality Analysis (LQA) process that's included in the system. When this is operating, not only do all the stations in a network keep in contact with each other, but the quality of each link is measured and recorded. There are three main measurements: Bit Error Ratio, Signal to Noise (SINAD) and multi-path distortion. As each link is checked it's given a LQA score based on its performance. This information is then used so that the system can pick the best link for a given type of communication. As you can see the ALE system can really transform a seemingly unpredictable h.f. network into a reliable workhorse.

ALE Monitoring

One of the reasons for choosing to mention this system in this column is the availability of some new software that will allow you to monitor ALE frequencies and see just what's going-on. The system has been put together as a personal project by Charles H. Brain and comprises a complete ALE control system based around a standard PC. As well as providing all the key elements of the ALE system he has built-in support for many common amateur and s.w.l. radios. I've shown some screen shots so you can see just what the PCAle program looks like. If



Fig. 1: Screen-shot of the PCAle Set-up Screen.

you're a licensed amateur you can use the system to link between stations and even control the operating frequency. The radios supported is growing rapidly and the latest version includes: FT-757GX, HF-1000, TS-850, IC706, IC735, IC746, IC-R75, NRD-535, NRD-545, R8500, TT550 and WJ8711. For the listener, you can tune to one of the many known ALE frequencies I've shown in **Table 1** and monitor the setting-up of various links. In some, but not all, cases you will find that the monitored frequency also carries the traffic.

If you want to get more involved in ALE and have Internet access there are some very useful links - see the Web Watch panel:

Basic Connections

Bob Birnie has written asking for some help with the interconnections between his radios and computer so he can start decoding. The connections you need will vary depending on which program you're using for your decoding. Perhaps the easiest way, if you have a modern PC with a sound card, is to use one of the programs that use the sound card to process the audio from the receiver. In this case the connection is usually pretty straightforward. Most sound cards have two possible input connections, both of which are usually 3.5mm stereo jacks. The two options are 'MIC' input and Line input.

Both are very similar except that the microphone input is usually more sensitive. My preference is to use the 'Line-in' as this is usually better suited to the sort of audio signal levels that you will be feeding from your radio. However, if this doesn't seem to work, you may find you need to specifically set your program to use the line input as opposed to the microphone. You will need to check the instructions to see how to change this. In a few cases you may find you can't get the program to use the 'line-in', so you will have to just changeover to the microphone jack.

Now for the receiver connection. By far the best option is to use the 'line-out' or 'record-out' if you have such a connection on your receiver. The reason this is favourite is because the audio signal is fed to this socket before it goes to the volume control.

This means you are free to alter the listening volume without worrying about whether there's enough signal to drive the decoder. This is especially important for those late night DX sessions! If you have a conventional table-top communications receiver you should find that it has a 3.5mm jack for the line or record output signal. If this is the case, you just need a simple connecting lead with a 3.5mm jack at both ends. Don't worry about the fact that the receiver has a mono jack and the sound card has a stereo jack - you can safely use a mono lead. In some cases you may find that your receiver has either a 5-pin DIN socket or maybe phono sockets for the recorder output. This again is simple as most radio/TV shops or component suppliers should be able to help with this. All you need is a tape recorder lead from 5-pin DIN to 3.5mm jacks or phono to 3.5mm jacks.

If you're using a program such as *Hamcomm* or *JV FAX* you will have a slightly different problem as

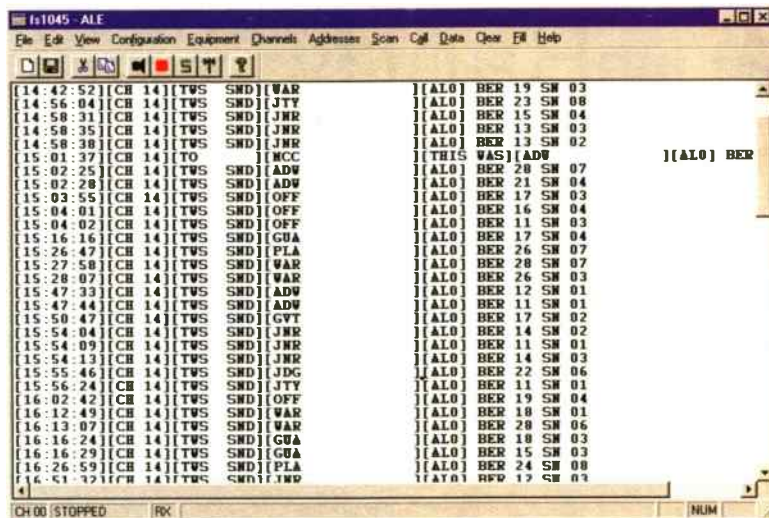


Fig. 2: PCALe in action monitoring an ALE link.

these programs require the use of a comparator interface. One of the best sources of these is Pervisell (see this issue of *SWM*). These are almost invariably supplied with a 3.5mm jack plug ready to plug into your receiver. If your receiver has a DIN or other connector you will need an adapter to complete the connection.

As with the sound card option you should find these available from most good Radio/TV shops or component suppliers such as Maplin.

Table 1:

ALE Frequencies.

Frequency	Operator	Frequency	Operator
		8.965	USAF
2.250	DANISH MIL	10.190	ALGERIAN
4.721	USAF	10.238	AFO1/KAI1 NET
4.841	DANISH MIL	10.275	UNID
5.120	DANISH MIL	10.581	SWEDISH DIPLO
5.784	UNID DIPLO	11.0735	USAF
6.481	UNID DIPLO	13.215	USAF
6.689	UNID DIPLO	13.375	UNID
6.715	USAF	13.390	UNID DIPLO
6.721	USAF	15.016	USAF
6.863	ROMANIAN DIPLO	15.043	USAF
6.889	ROMANIAN DIPLO	15.860	SWED DIPLO
6.980	SWEDISH DIPLO	15.888	AFO1/KAI1 NET
6.981	UNID DIPLO	16.105	SWED DIPLO
7.375	ALGERIAN	16.105	USAF
7.375	USAF	18.003	USAF
7.620	AUSTRALIAN MIL?	19.060	UNID
7.672	USAF	19.340	AUSTRIAN UN
7.720	AFO1/KAI1 NET	20.031	USAF
7.915	AFO1/KAI1 NET	20.958	SWED DIPLO
7.972	SWEDISH DIPLO	23.337	USAF
8.046	UNID	24.268	UNID DIPLO
8.859	UNID	27.870	USAF

Web Watch

- Charles Brain Home site for PCALe <http://www.chbrain.dircon.co.uk>
- World Utility Newsletter - excellent ALE article and frequencies: <http://www.wunclub.com/>
- Various Data and sound sources: <http://rover.wiesbaden.netsurf.de/~signals/WAV/MIL-STD-188-141A.WAV>
<http://webhome.globalserve.net/rlacroix/modems/ale.html>
<http://home.istar.ca/~racalcan/appnotes/ale.htm>

■ PAUL ESSERY GW3KFE, PO BOX 4, NEWTOWN, POWYS SY16 1ZZ

Amateur Bands

Sunspots

Statistically we can show a roughly eleven year cycle and that the sun has an active side and a quieter one. What we can't do is to predict that a sunspot will appear at, say, noon tomorrow, nor do we know their cause.

Geomagnetic disturbances giving a high value of the Ap or K indices are usually bad and when Bz goes negative, conditions may show predisposition to aurora. The predictions given each Sunday on GB2RS were made several days earlier.

For the 'daily' detail you need to be prepared to go to 10MHz where DK0WCY lives and to copy down what he says in Morse. After a while you'll probably find his signal strength and QSB is a further indication. If your Morse isn't up to it, try taping it and playing back at slower speed.

Problem!

Paul Goodhall's son **Peter** has his own receiver, and can also drive the OM's gear when Dad is out of the way! Peter has an eyesight problem making log-keeping difficult. My own thoughts are firstly to announce call sign detail to a tape-recorder, playing it back and logging afterwards.

Secondly, with computerised logging, to use a program that permits large letters - perhaps **Paul O'Kane EI5DI** might have some thoughts on this idea. Thirdly, for paper logging, I recall a device I made some years ago for a disabled person - in essence a bit of aluminium with a 'lip' so it could only be slid up and down the page and a slot in which to write. Down the 'lip' I marked the line spacing with scratches she could feel. By using this and a bit of memory, the lady was able to write a letter in which her script ran across the page line by line instead of 'all over the place'.

Is there someone out there with better ideas? Remember, your ideas may help many amateurs and s.w.l.s. Still with Paul and Peter, we can say they haven't missed much - if there's room left, we'll detail it later.

Now to **Harry Richards** of Barton-on-Humber who enclosed a press report by Michael Hanlon on Extra-Terrestrial Intelligence, (*Sunday Express*, January 16), and saying that we don't need UFOs for this. Why even mention UFOs unless it be to sell another paper or two? The author also does not notice that absence of evidence is not evidence of absence!

Grey Line

Our anonymous correspondent is sticking to her RAE studies like glue. Talking about h.f. propagation her instructor mentioned the 'grey line' without defining it. There will be places world-wide where it is dawn or dusk. Join these places on a map and you have a 'grey line' between the 'daylight' and 'night' portions. When two places are on the grey line one may hope for a brief period of improved propagation if the 'dawn' is at the eastern end of the path - hence Ws on Top Band in the early mornings.

Now **John Collins** in Birmingham - I wonder does he live just to the south of the M6? I spotted a triband vertical on a tower block before hastily going back to steering! John had a listen on 'that night' and found at 0030 M0BAV/2K.

At 2145 CG1JF Victoria Beach Nova Scotia working Europeans - antennas over salt water do make a difference! EU5R was noted 2200, calling for his QSLs to **220036, Box 57, Minsk, Belarus** with an IRC or a dollar. Finally EU1SA at midnight - this one saying he wanted his cards via the Bureau.

On a different tack, I had a delightful Christmas card from John - my XYL took such a liking to the picture she grabbed it and it still adorns the kitchen!

Freepost

The British Amateur Radio Teledata Group (BARTG) now have a Freepost address for enquiries about membership: **BARTG, Freepost NEA8763, Rotherham S66 7BR**. Please only membership enquiries and correspondence though.

Reports

On to Barnsley and **Colin Dean** - on 28MHz Colin noted AP2JZB, A41LZ, CO6XN, CP6XE, NP2BT, OD5NH, PZ5RA, P43P, TA3DD, TZ6YV, VP5/K4ISV, WP4M, Z21FD, 5A1A, 5N0WFW, 5X4C, 5Z4IC, 7Q7BO, 8P9DX, 9K2SQ and 9Z4CT. On 21MHz - clearly a favourite - he noted AP2P, UR3IDD/MM off CN8, EK1700LF, ET3AA, EX0V, FR5BT, J73UE, KP2BH, OD5NH, P43W, TF3GC, UN7JAV, VK2-3-5-8, VP2EY, VP5/K4ISV, VQ9GB, VR2KF, VU2ABE, XZ0A, YC0GRF, 1B1/OE5GML, 3B8/15JHW, 4L1FL, 4U1WB and 9J2BO. At 18MHz ET3GSC, K6, N7, OD5NJ, TA2BK, UT1FG/MM VK3BM and on 14MHz AP2P, A41KL, EK8WB, EP2MSH, JY5HX, KL7IDA, VK6, VK8, VQ9GB, W6, W7 and XZ0A. Forty gave Colin BV2RS, DU1EIB, EA9AU, JA2, JA3, OD5/9K2MU, TZ6YV, T88LJ, VE2QR, VK1MJ, VR2MY, VU2PAI, XU7AAY, XZ0A ZS6AUL, 4L2M, 5A1A and 9K2NB. Finally 3.5MHz for C31UA, DU6BG, EX0V, VK5PO, XZ0A and 7X5JF.

Now to c.w. and **Ted Trowell** in the Isle of Sheppey. Ted notes first how the XZ0A operation attracted the usual jammers and tuner-uppers. Nonetheless Ted went on Top Band for UK9AA, LX1TI and XZ0A and around the same mid-evening time on Eighty he knocked off XZ0A again plus JT1BH. Forty gave him XZ0A, 4JY2K, X79SXW, EV/G3WQU, JY9NX, VQ9NL and XU7AAZ.

At 10MHz Ted collected VR2GY, OD5/F5JQM, VQ9VK, OY3QN, OX3FV, XZ0A and CO8ZZ. 14MHz was OK for TF3DX, FH/G3SXW, JY9NX, W6CYK, V51AS, PT7AA, ZD7BG, 8J1RL and YV1NX. Teatime on 18MHz secured VE6XG, ZA/OK1JR and VQ9VK. Up again, 21MHz produced JT1KAA, EA6NB, 5X1P, WX7M, EA9HU, FP5EJ, PY2OW, VE7VF and V51AS. Another shift to 24MHz accounted for S79TXF, KP2J and XE2NJ, while the 28MHz collection included VR2GY, VK3WAC, LU9AFZ, YV1NX, XQ0YAF, ZF2MU, W0KC, 8P9EM, CI0XNP, CX8DR, ZV4C, N7XM, CX3EU and KP2J.

Older readers who recall Hilton's Lost Horizon and the film version may recall the place was called Shangri-La. CX8DR lives there, and has held a 'ticket' for 62 of his 81 years. Seemingly there are two areas of the world noted for very long life - Vilcabamba and a region in CIS Georgia. About the only common factors are a **very** active life, constant temperature, high altitude and a diet we would describe as near-starvation!

There was an article years ago in *Scientific American* on the subject. On a different tack, Ted notes QSLs for CO8ZZ go to DK1WI; for 4JY2K to TA2ZU; for FP5EJ to K2RW and for VQ9VK to N1TO.

Here & There

Aves, YV0 is postponed - transport problems. As for VU Andamors or VU Laccadives, VU2NTA sees no hope in the foreseeable future. On the other hand VP6 Pitcairn activity by OH2BR has started, and Jukka is there for four months. Looking ahead a little, we can expect Tromelin activity this summer - probably August - by the Lyon DX Gang. You might just catch Chesterfield Island TX0 for a new one, all bands up to 50MHz. If all goes well 3B6RF will be operational October 7-23 from Agalega.

World-wide Thoughts

There is a World Radio Conference (WRC) in May. Radio amateurs world-wide are fretting about the possible loss of frequencies to satisfy the multitude of non-amateur requirements. The International Amateur Radio Union will be there.

In many countries we note that 'war-chests' have been set up to fund delegates - and already appeals go out to refill them! Make no mistake about it, WRC 2000 could see us lose some spectrum, and we haven't even come to WRC2003 when amateur radio as a total activity comes under consideration.

Every iota of support our own RSGB can give to IARU will be given, and it behoves us all, whatever we may think of RSGB at the local level, to support RSGB's efforts at this and the next WRC. Without a **strong** IARU, we are lost. Anyone thinking this is a 'Jolly' need only see our representatives on return - exhausted.

As always, input to me by the first of the month please, the address is Box 4, Newtown, Powys SY16 1ZZ, or via the E-mail address on the contents page.

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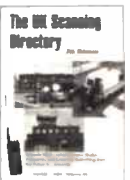
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Attention-123!

Mysteries Of The Messages

We all know that the strings of number groups sent by most so-called Number Stations are encrypted messages - usually sent to the agents in the field from their controllers. Being encrypted, **nobody**, apart from those involved, are able to read these messages. However, there's still a lot we can find out through analysing 'externals', i.e. everything related to the transmission - format, content, technical aspects, etc.

In this column, we'll be concentrating on the message 'blocks' themselves, which constitute the 'text' in the majority of stations. Most of them send strings of five figure groups (paired or single), where the figures appear in a random and unpredictable sequence. (There are exceptions, but we won't deal with them here). It is the randomness of these message blocks that indicates the likely form of encryption - one-time pads, modified Vigenere, 'dictionary codes', etc.

So, what else can we learn from these messages? Actually, quite a lot. We'll start with message length, known as Group Count or GC. Most 'Text-type' stations send discrete (open) GCs in their preambles and for some of them, also in their endings. These are two or three figure groups, sometimes preceded by words like 'Count', 'Gruppi', etc. This number indicates to the recipient the length of the following message - measured in number of groups (or group-pairs). There is no technical need to have messages split into strings of groups.

In theory the text consists of a continuous, unbroken string of figures. Grouping is purely intended for ease of copying, and groups of five figures are the optimum length for our minds to handle easily. The recipient copies these groups down in rows (usually of ten) and when the message/s have ended, counts up all the groups. The result should tally with the GC given.

Message Length

Message lengths vary considerably, and in recent years have been as high as 431 (approaching the limits of human endurance!) and as low as...well, giving lowest GCs can be misleading, for very low GCs, such as four or less, often turn out to be 'Control-type' transmissions - not sending messages in the normal sense of the word. GCs of below 10 are uncommon for all text stations, apart from E10, E15 and some M76 messages. GCs of over 300 nearly always only occur in the Russian family (I), many other stations rarely exceeding 100.

From this, it can be seen that different families of stations have different views over what constitutes a long or short message. When M17 sends more than, or M12 sends less than 40 groups, these are big events! Even in the same family, typical GCs between different stations can be quite different, e.g. M13 rarely sends over 30 groups, yet E18 will commonly send over 100. This tendency even occurs between different schedules of the same station, for instance, we can expect M12's schedule 658 to send between 139 and 146 groups - always. Its linked schedule 749 does the same, but also sends regular null message transmissions at specific times, whereas certain other M12 schedules may send anything from around 30 groups (rare) to over 300.

'Typical' Group Counts

Mention of the above very narrow range 139-146 brings us onto the idea of 'typical' and 'maximum' GCs. Some stations (or schedules of stations) are very conservative as far as message length is concerned. The 139-146 range is common with M12 and XP (Polytone) generally. This appears to be due to limitations imposed by its standard repeat sequence. Sent at its usual speed, M12 messages cannot exceed around 150 groups without having to delay the two following repeats (sent at 20min intervals on different frequencies).

However, when longer messages need to be sent, this rule is broken and repeats delayed by 5, 10, 15 minutes as required. As so many messages fall within the 139-146 range, they can't possibly all be valid from beginning to end - the actual valid content could be considerably shorter, and this must be indicated somewhere early on - possibly hidden in the Decode Key or first message group.

Another example is M3, whose majority of transmissions send no message, and the rest send GCs nearly always between 50 and 56.

Here again the true length of message is hidden. M3's special schedule (121), however, among other odd characteristics, has no typical GC, has only once been known to send a null message and has GCs varying from around 20 to over 100.

Some stations never send more than a set number of groups, although their GCs vary. The CIA's E5 and V5, for example, now have a maximum, commonly reached, of 215. This was once 225, then reduced to 215, but now there have been occasional reports of this rule being broken with 217, 225s and even a 235 - which could have been an error.

No Group Counts

There's another group of stations which never send GCs at all. This is because they are unnecessary as message length is always fixed. These include MI6's E3 (Lincolnshire Poacher) and E3A (Cherry Ripe) which always sends a fixed 200 groups, the DGSE's M51 - fixed at 100 GC. The Cuban M8 and V2A each send three consecutive message blocks of 150 groups each.

Family XI's M4 sends a fixed 100 groups, and its voice arm E23 (formerly 'Swedish Rhapsody' G2) now always sends three unbroken message blocks of 100, 100 and 50 groups. Here again, not all these messages will be valid, and of those which are, their lengths are 'opaque'. Therefore, we have no way of analysing their traffic levels.

None of these have null message formats, but most use five figure random 'headers', which occur in preambles and precede individual message blocks. It is these headers which carry encrypted validity indicators/group counts. From the very beginning, the authorised recipient will know how many groups to copy down, if any at all.

One other family never sends a GC, yet its message lengths are **not** fixed. This is Family XIII, (but only applies to M29A and G4), which by using non-random five figure groups of a unique type, cannot be sending text-type messages. The lack of GC may indicate that the recipients could even be already aware of the message length prior to the transmission.

No Messages

Many stations use 'null message formats' to indicate to the recipient that no message will follow, and therefore the recipient can switch off the receiver. This is useful for he or she as they needn't bother about encrypted validity indicators or waiting for preambles. It also saves on transmitter air time, as a short five minute transmission is all that is needed.

However, the use of null message formats can at least give monitoring agencies some idea of traffic levels on particular schedules. I say 'some idea' because this still doesn't necessarily mean that all messages are valid, or that at least some of their group are dummy fillers. (This must certainly be the case with M12's 749 schedule, for example). All we can be certain of is that if a schedule sends a null format, the 'agent' received no further information at that time.

M23 is very interesting and complex operation in that it is the only station to use format disguises - and it has very many of them! One of its most popular forms is the use of different schedule numbers depending on whether a message is due to follow or not. One version of this is the use of all odd numbers to mean 'no message', and all even numbers to mean 'stay tuned, there's a message on its way'.

One of these schedules (579) has now been running continuously twice daily for over three years. (0800 and 1400 on 8.307/9.285MHz from transmitters at Syracuse). We've mentioned this schedule before, and its purpose can only be guessed at. As no messages have yet been sent - indicated by its all-odd SN - the recipient(s) must be getting a little impatient to say the least.

Imagine the suspense before tuning in, never knowing for sure whether, one day, those three odd numbers will be replaced by three even ones! Imagine the excitement if this were to happen, say, on April 1st - the frantic scuffle for pen and paper and a shaky, unpractised hand somewhere, copying down the groups, and afterwards, in trepidation, deciphering them only to find the message said 'April Fool!'.

This is merely an introduction to the subject of message length, but we hope that it has encouraged you to do a little more monitoring and research for yourselves. All your reports and comments are, as always, very welcome.

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Index to advertisers

Aerial Techniques45
Air Supply81
AOR76, 77
ASK Electronics64
Aviation Hobby Centre81
Broadcasting Communications
Systems58
C M Howes60
Celebrity Communications32
Cellular Design Services35
Chevet Supplies45
Computer Aided Technology74

Flightdeck81
Haydon Communications19, 20, 21
Icom (UK) Ltd27
Interproducts74
Javiation74
Jaycee Electronics81
Lake Electronics60, 81
Lowe ElectronicsOBC
Martin Lynch & Sons42, 43
Moonraker (UK) Ltd14
NevadaIFC, 1, 50, 51
Optoelectronics28, 55

Pervisell Ltd81
PhotAvia Press74
QSL81
Radioworld36, 37
Roberts RadioIBC
Simon Collings60
SRP Trading8
The Shortwave Shop60
Timestep Weather Systems70
Waters and Stanton24, 25

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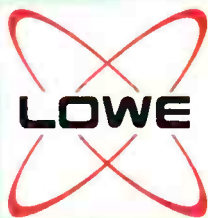
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