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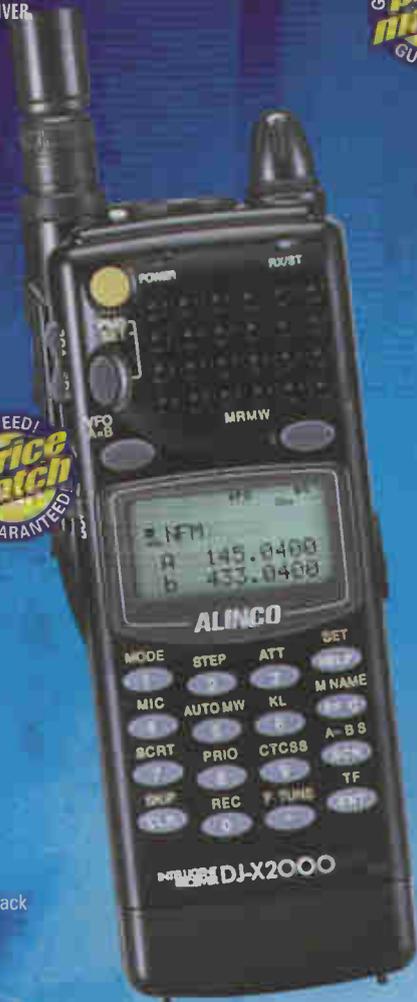
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Broadcast

- 14 LM&S
- 23 Bandscan America

Features

- 24 **EXCLUSIVE! Icom R20 Review**
Dave Roberts has another attempt to 'beat the clock' whilst looking at the brand new and remarkable Icom R20 hand-held scanner.
- 28 **Win Tickets to RIAT 2004**
This year's Royal International Air Tattoo will be held at Fairford in Gloucestershire between 17 & 18 July 2004. Here's your chance to win one of the 10 pairs of tickets kindly donated by the organisers.
- 32 **Remote Radio For All**
Kevin Nice shares a well kept secret that allows you to monitor your favourite chunk of spectrum at those times when you're away from your shack. The DX Tuners network currently offers almost 50 receivers world-wide.
- 37 **HF Aeronautical Traffic, ACARS & Weather FAX**
This is the second 'Big Ears' article to help you get you going on listening to the comings and goings in the skies above us.
- 43 **New Series - Starting Out - Part 1**
Due to much reader demand, this month we start the rerun of the excellent beginner series written by the late Brian Oddy.
- 71 **SWM Club Listing**
Are you alone with your radio interest? If you want to meet others with a passion for radio, then look no further. Use our comprehensive and most up-to-date guide to local clubs - now includes National and International Radio Clubs.

EXCLUSIVE!

Icom R20 Review



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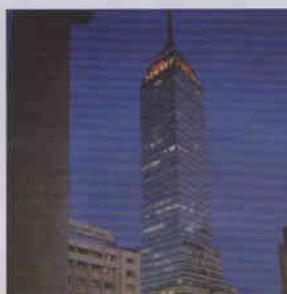
contents

Regular Columns

Advertisers' Index	78
Amateur Bands	51
Bandscan America	23
Communique	9
Decode	46
DXTV	55
Editorial	6
Info In Orbit	57
LM&S	14
Order Form	78
Propagation Extra	53
Propagation Forecast	52
QSL	7
Rallies	11
Satellite TV News	54
Scanning	75
ShackWeb	48
Sky High	62
SSB Utilities	61
SWM Book Store Catalogue	66
Trading Post	76



cover subject: *The brand new Icom R20 can, amongst other things, record more than four hours of audio!*



For the latest radio news, see our web site www.pwpublishing.ltd.uk/swm/news/

Share your thoughts

Join in with the on-line action on the SWM Readers' E-mail Forum - send an E-mail to swm_readers-subscribe@yahoo.com to subscribe - don't miss the on-line action!

Coming Next Month

in SWM May 2004

- SSB Special with Ben Hogan
- New! - Beginner Series - Getting Started - Part 2
- Summits On The Air
- WIN! an IC-R20
- Keep on top of the world of monitoring with SWM
- and much more...

**contents subject to change*

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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.

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 £3.75 inc P&P each and photocopies are £3.00 per article inc P&P. Binders are also available (each binder takes one volume) for £6.50 plus £1.50 P&P for one binder, £2.75 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 £2 inc P&P.

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Technical Help

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

I am sure it will be much to the delight of **Ronald Evans**, who was keen to share his controversial views on the letters page back in February's SWM - the debate still rages in QSL this month - that we take a look at an on-line network of remote receivers that can be tuned by those registered users who connect via the Internet. The DX-Tuners facility is unlike other remote receiver sound servers that exist around the world and there have been a fair few mentioned by **Martin Peters, Dave Roberts and Jerry Glenwright** within the pages of SWM over the past few years. The main difference is the ability of the user to not only monitor the airwaves via the receiver but they can operate the controls too. I have personally been a user of this system for some time and I'm investigating the possibilities of running a remote server from my shack. It is very likely that by the time you read this you'll also be able to listen from my radio room too.

Please feel free to connect to and see what you can hear from my location, I'd be interested in hearing any comparisons

SWM Listening Contest

Don't forget, Monday 3 May is the day of the second SWM Listening Contest. We'll be on air between 0700 and 1600 from grid reference SY700727, the same as last year, on the Isle of Portland operating around 7.070MHz (40m). If you are licensed then please call us. This year we are hoping to work more stations than ever to make the event even more interesting for all those involved. If you happen to be in the area, please feel free to drop by.

You may have noticed that we've changed the day for the contest this year in an attempt to avoid a repeat of the rather disruptive QRM encountered with last year's activities. We look forward to many of you calling in to join in with the fun.

The overall winner of the SWM Listening Contest will have amassed the most points based on the stations they have logged during the nine hour operating period. All stations logged must have worked the Event station **G3SWM** to be a valid logging. All reports must include the report given to G3SWM and the serial number allocated by G3SWM, if the contact is to be considered. Please note that the event station will not be repeating their received report from the station worked, so you'll have to listen carefully. There will be several winning categories, including overall winner, best UK place and best overseas place.

The full rules were published in the March issue of SWM or you can view them at www.discovery-com.org/swm/contest/ if you have 'net access. Listen, log and win!

Starting Out

One common request that I receive from readers who are new to SWM, is that we include a series for beginners. This month sees the revision and re-run of the late **Brian Oddy's** series for those new to the listening scene - 'Starting Out'. I know that first time around the feature helped many who were new to the hobby. I hope it's as useful this time.

In The Ed's Shack

In the coming next month section in the SWM April, we advertised that I would be covering the construction of an Active Loop antenna for v.l.f. in my 'In The Ed's Shack'. Due to the unexpected early arrival of the superb new Icom hand-held R20 scanner, the v.l.f. antenna feature will be included next month instead. Sorry for any disappointment.

Acorn 3 Errata

Regrettably, the drafting process has produced an error in the Acorn 3 circuit diagram Fig. 1. of last month's project. Both ends of R2 are soldered across both ends of L2, but the joining dot has been omitted and instead, it's shown as a crossover. If anyone builds the receiver without the top end of R2 being soldered to the top end of L2, there will be no reaction control and the whole thing will just oscillate.

Anyone unfamiliar with old valve circuits might not realise that the purpose of R2 is to damp out oscillation in the reaction circuit. So please take note.

Free Nevada Catalogue

This month those nice people at Nevada have provided us with their latest tasty looking catalogue packed full of receivers, antennas and accessories. If you're looking for a new addition for your shack or a new radio to secrete about your person then I'm sure you'll find this free short form most useful.

Our thanks go to Nevada for including the sumptuous catalogue.

4/24/73 Kevin

QSL

THE BEST LETTER WILL RECEIVE
A £20 VOUCHER TO SPEND
ON ANY SWM SERVICE.

Dear Sir

I felt compelled to write a letter to QSL after reading in the March issue a letter from G.S. Davill from Hull regarding your terrible logo. I'm afraid I agree with him, *SWM* does indeed at first glance look like *SWIM*.

If you're new to this hobby and looking for a suitable magazine *SWM* (or *SWIM*) does not exactly catch the eye on a newsagents shelf. *Short Wave Magazine* as it used to be known looked much better.

As a subscriber to 'SWIM', sorry, I mean *Short Wave Magazine*, it doesn't really affect me, however, I hope the 'top brass' there at *Short Wave Magazine* will take note, *SWM* is a terrible logo. I hope you will take this as constructive criticism because otherwise *Short Wave Magazine* is a great read.

**George Ryan
Warrington
Cheshire**

Dear Sir

The March issue of *Short Wave Magazine* contained the sad news of the passing of two veteran authors, that of Brian Oddy (*SWM*) and Tom Walters (*PW*). I would echo the sentiments of our editor Kevin, Ron Ham and Liz Walters in expressing condolences to their relatives and that of many readers who will miss their writing, their passion for the hobby and for many the loss of a friend. They will be missed.

Elsewhere in the March issue of *SWM* a letter in 'QSL' from M.D. Smith (Staffs) aired several positive thoughts including that of the future of DAB as a receiving medium and comments of possible limitations of DAB within a DXing environment. Very few folk own a DAB receiver and DXing reports will naturally be lacking. However, one reader - Cyril Willis near Kings Lynn - has reported some success with 'DAB-DX' from the Benelux and from other UK multiplexes and this over distances of several hundreds of kilometres on a basic receiver and using an (incorrect) f.m. Band 2 antenna - DAB uses the upper part of Band 3!

Checking out an Internet listing today revealed perhaps a dozen DAB tuners (not the Evoke type portable receivers) with at least one tuner featuring DAB coverage of both Band 3 and L Band. Currys and Comet stores are selling two DAB tuners priced at

under £100. Checking out the WTFDA site (a USA TV and f.m. DXing club) will reveal success in digital TV DX over hundreds of kilometres during tropospheric 'openings'.

Look back a decade and my 'Satellite TV News' column in *SWM* was reporting only analogue TV reception, check out this month's column and you will find only digital reception. Grasp of the emerging technology just by using it creates confidence and suddenly you're digitised!

As Mr Smith comments 'DAB is still in its infancy'.

**Roger Bunney
Romsey
Hants**

Dear Sir

Feedback on *SWM* front cover:

The front cover design should, in my opinion, be something along the lines of *The National Geographic* magazine, i.e. it is instantly recognisable. Their front cover has remained basically the same format for over thirty years, probably following the old maxim, 'if it ain't broke, don't fix it'.

Prior to a change of front cover design, may I suggest some form of notice in the magazine. I have my copy on permanent order at the village store, so a change of cover design does not affect me.

Regarding the Fairhaven RD500VX, which has been in almost constant use since it arrived on 12 December. This is one remarkable receiver, I have received pictures from NOAA WXSATS on 136.2 and 137.5MHz have also heard Brisbane ATCC on 5.643MHz.

During my career both service and civilian, from h.f. Morse to Commsat, I have used various RXs from the R1154-1155 RX/TX back in the 50s through to RA17, RA1792 and Watkins Johnson, Collins, etc. and have also used the Icom-R8500, and have to say, that I think for sheer versatility the RD500VX is one of the best yet.

The facility of database manipulation is a terrific one, making it possible to enter different frequencies and modes sequentially in one memory bank. Thus allowing one to go from v.h.f. to u.h.f. then onto h.f. at the press of a button. Once again, thanks for a great magazine and a super prize radio.

**Len
via E-mail**

topqsl

Dear Sir

You called for readers responses to February's Top QSL letter - as a relative newcomer (and therefore inexperienced) s.w.l., at perhaps the younger end of your readership (41 - one of early computer generation), I couldn't disagree more with the comments made in the letter.

I work everyday with computers as an essential tool in running my business activities and to be frank, consider the PCs at home as no more than a necessary evil. The 'joys' of surfing the web are overrated and the idea of 'listening in' to broadcasts on the PC leaves me cold - the pleasure for me is to operate a piece of high quality, professional equipment (I purchased a Drake R8B via your Trading Post some two years ago) that needs constant 'tweaking' and adjustment to keep the received transmission loud and clear.

You actually need to be **involved** - not simply click a mouse and sit back. Pushing buttons isn't much fun - tuning dials and fiddling with 'notch' and 'passband offset', even though I don't fully understand their theory - is far more involving and that's the point. The 'Man/Machine Interface' - in today's jargon - actively needs your concentration and involvement.

The appeal for me is the idea that someone - somewhere in another country - is pumping out a transmission which I'm actively having to chase down. Where's the pleasure in simply pushing a mouse and hey presto, there's the station?

I'm not sufficiently well versed to debate whether the Internet - fixed or otherwise - will ever replace h.f. transmission, but having a financial appreciation of the non-recurring costs of putting in place the infrastructure required to support the level of coverage and backup needs, I can't believe that h.f. is going to be 'dead' for a very long time to come - in first world, never mind third world countries.

To keep the s.w.l. hobby alive and interesting to a new generation, I believe that it needs to shed its slightly geeky, anorak image and focus more on the excellent and pleasure to be gained from picking up far flung transmissions. Make *SWM* more exciting - more equipment reviews (where is Mr Wilson?) more regulars like 'Off The Record', 'Attention 123' and 'Sky High', more articles and features of what I can pick up and how I can do it.

Moves such as the recent introduction of the Foundation Course M3 is also a positive, modern response and will/has inevitably led to more people getting involved on the basis that they can enjoy communications without having to get in-depth technical understanding of how it all works, (who doesn't use a computer because they need to understand why and how it works before they'll consider switching it on - my father - ex WWII RAF h.f., sparkly excepted!).

On a completely separate tack and a complaint! I buy *SWM* to read and learn about s.w.l., not whether my right to drive a vehicle along 'whites' (a rally term for dirt tracks/unmarked byways) is in jeopardy or not. I am a big motorsport fan (rallying in all its guises), so appreciate the Editor's concern over the possible loss of access - but is *SWM* the right place to champion this cause? I think not - the link between this bete-noir and s.w.l. in the article is tenuous in the extreme. Please Mr Editor, if you wish to comment on the merits or otherwise of LARA - write to *Off Road* magazine or some such appropriate publication, not take half a page 'Communique' in *SWM*.

Complaint over - thanks for an informative and interesting magazine and thanks also to all the contributors who make it possible.

**Richard Boyens
Sunderland**

Richard, the interesting points you make are noted. I must, however, defend the inclusion of the right of way threat. There is much mention of the Government proposals in motor press as you'd expect. But it is an issue that has far reaching effects for anyone who uses non-tarmac roads to access areas to pursue their interests in the countryside. The press release from LARA was sent to me on that basis. In the SWM offices alone, there is a >50% usage of such rights of way in pursuit of our radio hobby! - 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.

Dear Sir

I read Rodney Wild's letter in *SWM* March 2004 with some interest, as I noted his request for a 'Numbers Special' with an update of recently received frequencies.

Whilst that seems a reasonable request the entire subject, as your 'Attention 123' columnist will tell you, is a very fluid one. A good proportion of Number Stations, be they Morse or Language, operate to specific schedules that may, or may not, be simple. To produce a working frequency list with sufficient tolerance to withstand printing schedules and suchlike would be a very difficult, if not impossible task.

I note that Mr Wild has a computer, but is reticent to use it - that is a pity because what he wants can be found on the ENIGMA 2000 group site <http://groups.yahoo.com/group/enigma2000>

In the Files section is the invaluable and most useful ENIGMA Control List which defines and identifies the stations as well as giving some idea of the agency running the station along with particular associated stations to the family group the station fits. (The Control List is kept current by ENIGMA 2000 although it was originally devised and written by ENIGMA).

As well as that, the bi-monthly *ENIGMA 2000 Newsletter* can be downloaded and covers the majority of stations that have been heard, giving recent valid loggings and some station analysis.

A help to all is the Number Station Prediction List which covers a variety of expected transmissions for the forthcoming month. This allows the readers of the Newsletter to actually have an assessment of the stations activity from reading of others logs and guidance from the very experienced Dutch author of the prediction list.

To help others identify their findings we keep a current sound archive to make comparisons by. There is also a forum where members post their logs and opinions and which can, on occasion, be quite lively.

Access to the group is simple, just make your application and then answer

the E-mail that is automatically returned. When we receive the applicant's answer (within three days) we approve membership.

To help those who may wish to hear a Number Station for the first time, try E11 in u.s.b. as per the following schedule.

Day	UTC	MHz
Tue	0830	8.544
Tue	1030	7.749 poss. 8.759
Tue/Thu/Fri	1230	7.439
Tue/Wed	1300	8.088
Thu	0800	7.663
Fri	0800	8.091

These E11 frequencies are not 'written in stone' but they are as good as any other regular transmissions. The transmission, if a null message will only last for a maximum of five minutes, messages when they occasionally occur last a further 11min (if 67 groups).

While some members use certain stations to improve their Morse skills, others chase the exotics, some devote their entire listening to one particular station or group of stations. ENIGMA 2000 has several monitors who do just that and produce either an accurate chart to give a reasonable chance of receiving those stations or offer an analytical view.

So there you have it, current information, predictions, others logs, identification tools - can you afford not to join?

Paul Beaumont for ENIGMA 2000
g7vak@yahoo.co.uk

It is now a considerable time since we last had a feature covering Numbers Stations. I have discussed this with Paul, who's agreed that ENIGMA 2000 will produce a Numbers Station Special later this year. - Ed.

Dear Sir

I feel I must write with reference to your article in the Amateur Radio Column of January *SWM*. Your author shows concern for lack of information on the Intermediate Course and Exam.

I have grave concerns over the future of this level of licence. I have been teaching the hobby of Amateur Radio at Intermediate, Full and now the Foundation Levels for ten years. With the co-operation of the governing body for such being the RSGB, Christchurch Amateur Radio Society (CARS) has, over those years, had a great deal of success. We were originally just a teaching centre with examinations taken at local Adult Education Centres.

Five years ago, I managed to get CARS registered as an examination centre for City & Guilds of London Institute. Examinations from then on, were held within the club. The invigilator at such events was invariably that well known junior member of the councils of the RSGB Phil Mayer. Phil is a good ambassador for the RSGB but only eligible for Junior levels of council as he is only 87! Did I really say that - oh dear - how sad - never mind!

CARS has had some 150 successes at Novice/Intermediate and around the same at Foundation level. At Foundation level I accept nothing but 100% pass from my students, and to date I have not been let down. Since the licence structure changed, first with the Intermediate, then the Foundation, I have

repeatedly asked the RSGB to have our Club listed in Radio Communications as a Club promoting both Intermediate and Foundation licence.

Not once have I seen our Clubs details in print in that magazine. I have forgotten the number of occasions I have asked for this publicity - and even I do not appear anywhere as a registered Instructor. We have had students from Devon, Wiltshire, Reading, Isle of Wight, Southampton and goodness knows where else. All have had the same problem, finding Clubs that run Intermediate and Foundation Courses.

On a recent check on the RSGB website, searching for nearest Clubs Bournemouth able to provide Intermediate or Foundation Courses, have a guess what was found - you're absolutely correct - Sweet FA in the immediate locale - but - wait for it - help was at hand in Bristol (maybe) - Birmingham - or even Kent! Where was Christchurch Amateur Radio Society or Flight Refuelling - oh - that information must be in the MARS edition of *RadCom*!

The way I look at things, as a cynical type, is that unless something is done to shake up our national organisation in a serious way, the Hobby of Amateur Radio as we know it - will die - and not through old age - that's just the RSGB!

Oh bugger - nearly broke my neck getting off my soap box! Thanks for listening to this frustrated teacher of Intermediate levels.

JG GOSKR

Dear Sir

I'm appalled at the letter from Ronald Evans - it's so upset me - I'm writing this having just got my *SWM* from the local newsagent - and have not turned the page to enjoy the excellent magazine.

I only bothered to read the first paragraph of his letter. This man is not a s.w. enthusiast at all, not interested in the nuts and bolts, never held a soldering iron in his life, happy to press a key on a keyboard.

If you stopped such coverage as he's unhappy with, I could cancel my order at my local shop and no mistake. I even keep old articles on vintage 'days'.

I am 74 by the way. I was weaned on h.f. and I spent 26 years in the RAF as a Wireless Fitter. Poor Mr Evans, he missed so much.

I remember being at an h.f. (plus v.h.f.) transmitting station in North Africa (RAF El Adem,

near Tobruck), now and again our boss used to ask us to open a 'new' h.f. link (RT or WT) to (for example) the Canal Zone, or to the UK, even to Aden/Cyprus, "where have you" - all we get would be the h.f. frequency - nothing else. It was up to us (one corporal, plus two airmen) to sort how we'd do it and "open on the air at 0800 first thing in the morning" - quite often.

Sometimes we would get a good couple of days notice. We would have to sort out which actual transmitter to use - what power - and what antenna. We never had a compass to line up the line-of-shoot. I've spent hours/days working out lengths of antennas and types of antennas, from our tiny storeroom we would dig out coils of wire (100LD/300L copper wire) insulators, etc., and make the antenna and erect it. Antennas we had to make were anything from 'simple' quarter-wave h.f. verticals to 3 wire arrays,

rhombs, V-beams, etc.

I loved every minute of it, that is h.f., for goodness sake, do not take any notice of Ronald Evans' letter, the man has never tried even tuning the RX (loved the article on the SWB18 at Woofferton, etc., by the way) - changing frequency, having to adjust the number of turns on the huge copper coils, keep opening up the doors to get inside a living room size p.a. unit - to adjust power outputs, etc. I could go on and on, but I won't waste your time. Feel free to quote/edit this letter if you wish, but please do not take any notice of that terrible letter. I do not want to have to cancel my order for your excellent magazine.

SO Wilson
Alston
Cumbria

Point taken, Sid! - Ed.

Pierre Goral

We have been informed of the death of **Pierre Goral**, founder and president of SGC Inc., of Bellevue, Seattle, USA on 12 February 2004. Pierre was an internationally recognised designer, entrepreneur and leader in the field of r.f. engineering.

In his personal life, Pierre was a caring and devoted husband, father, friend, model citizen and community leader. In his leisure time, he was an artist, photographer, skier and snowboarder and demonstrated an appreciation of life in everything he did. He led an adventurous life, working in the jungles of Brazil as a young engineer and travelling the world to represent his company, SGC Inc., established in 1971. RF engineering was his passion and he devoted himself and his company to producing only the very finest, professional h.f. s.s.b. products. His emphasis on quality set the standard for the industry.

While the company mourns the loss of such a valuable friend and leader, SGC will continue to move forward and produce products to the standards the industry has come to rely on after more than 30 years of successful business.

Condolences for the family may be sent care of **SGC Inc., 13737 SE 26th Street, Bellevue WA98005** or by E-mail: sgc@sgcworld.com

(L to R) Steve Telenius-Lowe G4JVG (Editor of RadCom), Jeff Stanton M3JJS and Pierre Goral. Picture courtesy of Jeff Stanton.



Free Fluke CD

Fluke, the world leader in compact, professional electronic test tools, is offering a free interactive oscilloscope training CD. Designed to operate on a standard PC, the guide provides illustrated lessons regarding standard analogue and digital oscilloscopes and their use, together with information about how to obtain the best results from a Fluke 190 Series ScopeMeter™.



The Fluke ScopeTraining CD contains self-paced Training Modules, one set based on general Oscilloscope Theory, the second set explaining best-practice in the use of Fluke ScopeMeters. Oscilloscope Theory includes three lessons, covering waveform types and their measurement, choosing between analogue and digital oscilloscopes and setting up and probing safely. Interactive tests are provided along the way. The ScopeMeter section offers five lessons which include detailed use of all the buttons and displays, its use as a digital multimeter and recording device and how optional FlukeView software can be used to store and analyse captured measurements.

CDs can be obtained by contacting Fluke directly on **0207-942 0700**, FAXing on **0207-942 0701**, E-mail: industrial@uk.fluke.nl or via the Fluke website at www.fluke.co.uk

Icom's IC-7800 Launch

Rob Mannion G3XFD attended the launch of the Icom IC-7800 'top of the range' transceiver at Icom (UK) Headquarters in Kent on March 17. It turned out to be quite a day!

Icom UK's headquarters are in the aptly named Sea Street, just a traditional pebble's throw from the Thames Estuary and a 340 mile round trip from Dorset! I was there on behalf of PW Publishing Ltd. to witness the ceremonial 'launching' of the IC-7800 - the flagship 'top of the range' transceiver which Icom are promoting as the result of 40 years experience in serving the Amateur Radio hobby.

Although I was well and truly outnumbered by the Radio Society of Great Britain's contingent - including the President **Jeff Smith M10AEX**, *RadCom* Editor **Steve Telenius-Lowe G4JVG** and equipment reviewers **Peter Hart G3SIX** and **Chris Lorek G4HCL**, I - along with our RSGB colleagues enjoyed a morning excursion around the designer's ideas for the new - and very impressive looking - transceiver.

The IC-7800 has a top price of up to £7000 with a full range of accessories and "boldly goes where no other transceiver has gone before", by incorporating many new features. It comes fitted ready to go on PSK31 and RTTY and is also able to run a 100% duty cycle at 200W. All the keen keyboard operator has to do is to plug a keyboard in and they're off!

Most surprising however, is the fact the transceiver only uses a double conversion superhet design. A v.h.f. first i.f. is converted down to the second i.f. which is actually fully digital - providing all the benefits the

operator would expect from d.s.p.

Despite this simple statement - this rig has some incredible statistics and you'll be welcomed by Icom's chosen dealers to check over the specification - but be prepared to be surprised. "It's really something else", was the comment by one 14MHz DX-Hound! Suffice it to say - the *PW* review will need the skills of two specialist authors to try out all its delight when one arrives in Broadstone for evaluation.

Icom announced the rig would be in production for "many years" and each hand-made transceiver would be issued with an individual calibration sheet. The company don't expect to sell many IC-7800s - but those fortunate enough to afford one will no doubt attract as much attention as one of those £500,000 'super-duper' Volkswagen luxury (and armour-plated) cars that seem to even put a Rolls Royce in the shade as they pass you by!

Rob G3XFD

RadCom reviewer Peter Hart takes a close look at the IC-7800.



communiqué

Summer Frequency Schedules

The International short wave broadcasters started their summer frequency schedules on 28 March. The **World DX Club** publishes a 12-page pamphlet listing the times and frequencies of English broadcasts in country order.

Over 100 broadcasters are listed and the pamphlet is constantly updated so that the information is as up-to-date as possible when you order.

A revised edition covering the new schedules will be issued in mid-April. Copies are available for 50p or two IRCs from **Arthur Ward, 17 Motspur Drive, Northampton NN2 6LY**.

RAOTA Get-Together

The **Radio Amateur Old Timers' Association (RAOTA)** committee is delighted to announce a social event for all RAOTA members. On **8 May** between noon and 1600, RAOTA will be at the Brunswick Inn on Station Terrace in Derby. RAOTA has booked the Brunswick's first-floor function room and looks forward to an afternoon get-together of convivial talk, excellent company and good food.

All RAOTA members are cordially invited to attend and are welcome to bring their spouse/partner as their guest. In addition, if they have a friend who might be interested in becoming a member of RAOTA then they would be welcomed as an additional guest.

The venue, the Brunswick Inn, is located conveniently close to Derby train station, car parks and city centre shops. The Brunswick Inn has its own micro-brewery and offers excellent food and drink. The shops and tourist attractions of Nottingham are only a short train ride away.

There will be a small charge (no more than £3 per person) and this can be paid at the door. This RAOTA social event is being co-ordinated by **Ian Brothwell G4EAN**. It would be helpful if members wishing to attend let Ian know how many guests they are bringing. Ian can be contacted at **S6 Arnot Hill Road, Arnold, Nottingham NG5 6LQ**, E-mail: ian@bartg.demon.co.uk

GLARES Events

The **Great Lumley Amateur Radio And Electronics Society (GLARES)** meet at the Community Centre, Front Street, Great Lumley, Chester-le-Street Co. Durham every Wednesday 1930 to 2130. Just a few of the up and coming events are: Wednesday 28 April - talk by **Ken Watson G4GBF** entitled 'Behind the scenes in TV'. May 5 & 12 is On The Air Night, where everyone, but especially newly qualified amateurs, come along and practice their transmitting technique.

On Wednesday 19 May at 2015 - **Steve Townsley G7SPN** will give a talk on 'Making the most of your broadband connection - ADSL and Home Networks'. Wednesday 26 May is Committee Meeting and On The Air Tonight night.

Also, not forgetting, that the first Sunday in October, the 3rd, is the Society's rally, starting from 1030. There will be free parking plus easy access, with good, inexpensive food and drink. There will be a display by the Model Club with a stand and also a Bring & Buy in two sections - junk and good buys. Doors open at 1030 for all, including disabled visitors. Admission is just £2, free of charge to under 14s if accompanied by an adult.

Contact Rally Organiser **Nancy Bone G7UUR** on **0191-477 0036** (home) or **07990 760920** (mobile), E-mail address is nancybone2001@yahoo.co.uk or visit www.glares.org.uk for further information.

SSEG 2004 Programme

The **Scarborough Special Events Group (SSEG)** have recently sent in their programme for 2004. Lots happening. Let's take a look.

May 1-2nd - GB4RFA - RFA Wave Ruler: In 2002 the group commemorated the de-commissioning of Scarborough's adopted warship HMS *Fearless*. Her replacement will be the Royal Fleet Auxiliary vessel *Wave Ruler* which is the fourth vessel to be adopted by the resort and one of the most modern ships in the fleet, with a displacement of some 31,500 tonnes and a speed of 10 knots. The QSL will be a full colour photograph of the ship.

June 5-6th - GB6JUN - 60th Anniversary of D-Day: The 6 June 1944 saw the greatest air and seaborne invasion in history as operation Overlord was launched on the beaches and drop-zones of Normandy. The SSEG will represent the UK on the airwaves with this very special call sign, as a fitting commemoration of the occasion. A full colour souvenir QSL will be issued.

August 21-22nd - GB1SCA - International Lighthouse Weekend: Annual operation from the lamp room at the top of Scarborough Lighthouse. Built in 1904 Scarborough Lighthouse is celebrating its 100 anniversary in 2004. A special full colour souvenir QSL card will be issued.

The group will also be active throughout the year in major international contests using the club contest call M00 and also on 2m f.m. most weekends as **GX0000/P** in support of the Summits-On-The-Air organisation. Intermediate class demonstration station **2E0000** will be also be active on the QRP frequencies on June 17 for International QRP Day.

More details from **Roy Clayton G4SSH** (Chairman), **9 Green Island, Irton, Scarborough YO12 4RN**, Tel: **(01723) 862924**.

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Portable music just got more personal with this 'Toys for the Boys' Chic MP3 Player. Listen to over 80 of your favourite tracks wherever you are without a CD in sight!

Store your music on this portable pocket music player whether you're off on holiday, heading down the gym, to the office, beach or the potting shed. The slinky curvaceous design

sits comfortably in the hand.

Quick and easy to use, the player will run for up to 18 hours on one AA battery! It has a full graphical I.c.d. and EL backlight and is very user friendly, with a choice of 128 or 256MB embedded Flash Memory.

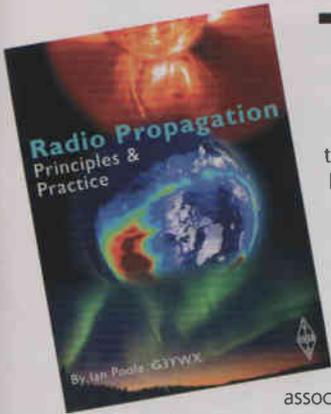
The lightweight music box



comes in a choice of colours with a USB Download lead, discreet earphones and will connect to the stereo for super sound. Prices start from £89.99 - telephone **02392 313090** or visit www.nevada.co.uk for more information.

rallies

New Book



The way in which radio signals propagate is a fascinating topic. A basic knowledge is essential for any short wave listener, Radio Amateur, radio/scanner enthusiast or professional engineer

associated with radio technology. In view of this, the book is likely to be of considerable interest to many people.

Radio Propagation, Principles & Practice gives a clear introduction to each topic, covering the ways in which radio waves travel at frequencies from the medium wave broadcast band right up to the microwave region of the frequency spectrum. The topics are explained in a clear and interesting fashion covering the major elements of radio propagation, and why they occur. In this way the reader is given a sound grounding in the subject, to enable them to understand why radio signals are heard and how best to hear them.

The author, **Ian Poole G3YWX**, has held an amateur radio licence for over 30 years and has written many books on Amateur Radio and electronics in an easy to read and informative style. He has also written many articles for magazines world-wide and is winner of the inaugural 'Bill Orr Award' for technical writing.

Contents: Electromagnetic waves; The Atmosphere; The Sun; Propagation near the Ground; Ionospheric Propagation; Ionospheric Disturbances, Storms and Auroras; Predicting, Assessing and Using Ionospheric Propagation; Tropospheric Propagation; Meteor Scatter and Space Communications.

Radio Propagation, Principles & Practice is in paperback, with 112 pages and is 240 x 173mm; published May 2004 and priced at £14.99 available from the SWM Book Store.

Club Talk

The **Bangor & District Amateur Radio Society** meet on the 1st Wednesday of every month in 'The Stables', Groomsport at 2000. On Wednesday 5 May 2004 at 2000 they are holding a talk on digital modes by **Harry G14JTF**. As always, visitors and new members are most welcome. More information from **Mike G14XSF** on **028 4277 2383** or visit the club's website at www.bdars.com

April 25: The 5th Annual Radio & Electrical Equipment Sale is to be held at the Aldridge Community Centre, Anchor Meadow, Middlemode Lane, Aldridge, West Midlands. Tables are £6 and admission is £1 (including free raffle). Doors open 1000. There will be a large car park, refreshments, RSGB book stand and much more. More information from **Doug G4LQY** on **(01543) 571269**.

April 25: The Lough Erne Amateur Radio Club are hosting the 23rd Enniskillen Amateur Radio Show in the Killyhevlin Hotel, Enniskillen, Co. Fermanagh, Northern Ireland. Doors open at 1200. There is a big car park and good food. Admission is £3 and includes a free ticket for the raffle, with valuable prizes. There will be a Bring & Buy with no fee, Amateur Radio, Electronics, Computers, etc. Traditional large attendance expected from all over Ireland, north and south. More information from **Herbie G16JPO** on **028-6638-7761** or E-mail: hng@ntlworld.com

May 3: The Dartmoor Radio Rally is to be held at Tavistock College, Tavistock, Devon. This is a new location to last year, with plenty of space for traders to display their wares and visitors to see them and talk to old friends. There is access for disabled visitors, plenty of car parking around the college site, along with trade stands, Bring & Buy and refreshments. Doors open 1030 (1015 for disabled visitors). This location is ideal for picnics, so why not bring the family. **Ron G7LLG** on **(01822) 852586**.

May 6: The Midland Amateur Radio Society are holding their Drayton Manor Radio & Computer Rally at Drayton Manor Park, Fazeley, Tamworth, Staffs on the A4091, close to J9 and 10 on the M42. The main traders will be in two marquees, there will also be a large outside traders flea market, along with local clubs and societies and a car boot area. 50 years of RIABC Group, Caravan and raffle and special interest stands. Doors open 1000. Trader information from **Norman G8BHE** on **0121-422 9787**, E-mail: nlgutteridge@aol.com mobile **(07808) 078003** or visit www.midamradio.co.uk

May 9: The Magnum Rally is to be held at Harbourside, Irvine, Scotland. Doors open 1030 till 1600 and admission is £3. Contact **Helen Mason MM0HLN** on **(07776) 385247**, E-mail: mm0hin@hotmail.com or visit www.magnumrally.freeserve.co.uk for further information and directions.

May 9: The Dunstable Downs Radio Club are holding their Annual 21st Amateur Radio Car Boot Sale at Stockwood Park, Luton. Access via M1, J10. Doors open 0900 and parking is £2 per car. There will be full catering and toilet facilities. Details and seller's booking form on www.ddrcbootsale.org or contact **Phil Seaford G8XTW**, Chairman, on **(01525) 384419**.

SCARF

The SCARF organisation was formed in September 1999 by a group of Scout Leaders who were Radio Amateurs and had been running JOTA & TDOTA stations for many years prior to the formation of the above.

SCARF assists at many events in Essex inside and outside of scouting including car parking at local events, JOTA, JOTI, TDOTA. Scout badge work and the Essex Scout International Jamboree which is held every four years. At this event the group supply radio kits, etc. which they assist the campers to build. Their excitement and enthusiasm is a great boost to members when they have completed the project and go away with a working radio, or other electronic gadget. This year **GB4FUN** will be on site all week.

In 2007 The World Scout Jamboree is taking place in Essex, Hylands Park, just outside Chelmsford and the group hope to be there assisting in some way at this Major Scouting Event. One of the group's main points is that they have been running Novice and

Foundation Courses for Leaders and Scouts.

The club have just run a weekend Foundation course for Scouts, Explorer Scouts and Leaders. This was a very tiring but enjoyable weekend. There were 18 participants and 14 passed. The other four will be taking a resit shortly.

SCARF has had 40 Foundation Course passes plus 11 Morse assessments. The Lead Instructor **Chris Chapman G0IPU** and District Cub Scout Leader in Chelmsford also ran Novice courses for Scouting people which 22 people were successful.

Andrew Finch was taught by SCARF and was the 5000th Foundation Licence holder and who appears on the new video from the RSGB. **Chris G0IPU** is Lead Instructor for Chelmsford Amateur Radio Society and has had 56 Foundation Course passes with another course

in progress at the present time with 14 people attending.

The Explorer Scouts and Leaders who have just passed their Foundation Course.



SCANNER BASE VERTICALS

SUPERSCAN STICK I (WIDEBAND)£29.95 PLUS £6.00p+p
*FREQ:0-2000 MHZ *LENGTH:100cm *SOCKET:SO239 *RADIALS: 3X17cm
SUPERSCAN STICK II (WIDEBAND)£39.95 PLUS £6.00p+p
*FREQ:0-2000 MHZ *GAIN:3.00dB OVER SSSI *LENGTH:150cm
*SOCKET:SO239 *RADIALS: 3X50cm

These two superb fibreglass external wideband antennas have capacitor loaded trapped coils to give maximum sensitivity to even the weakest of signals. No wonder they are best selling verticals !!!

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*SOCKET:SO239 *RADIALS:3X17cm

AR-50 (AIR BAND)£49.95 PLUS £6.00p+p
*FREQ:CIVIL & MILITARY AIR *GAIN:4.5/7.0dB *LENGTH:150cm
*SOCKET:SO239 *RADIALS: 3X50cm

These dedicated fibreglass external antennas are pre-tuned for both air band frequencies.

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SUPER DISCONE (WIDEBAND).....£39.95 PLUS £6.00p+p
*FREQ:25-2000 MHZ *GAIN:3.00dB OVER STANDARD *LENGTH:140cm
*SOCKET:SO239 *RADIALS:16

HF DISCONE (WIDEBAND/HF SENSITIVE).....£49.95 PLUS £6.00p+p
*FREQ:0.05-2000 MHZ *LENGTH:185cm *SOCKET: SO239 *RADIALS: 16

ROYAL DISCONE 2000 (WIDEBAND/STAINLESS) ,£49.95 PLUS £6.00p+p
*FREQ RX:25-2000 MHZ FREQ TX: 50-52 144-146 430-440 900-986 1240-1325
MHZ *LENGTH:155cm GAIN:4.5dB OVER STANDARD *SOCKET:N-TYPE

*RADIALS:16

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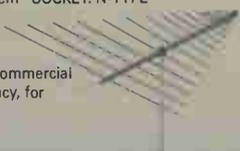
MLP-62 (LOG PERIODIC).....£169.95 plus £6.00p+p

*FREQ:50-1300 MHZ TX & RX *GAIN:10-12dB *LENGTH:

300cm *SOCKET: N-TYPE

These two beam antennas are sold mainly to our military & commercial customers. With an SWR 2:1 or better over the whole frequency, for performance it just doesn't get better.

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(Phone for 100 mtr discount price)

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G.SCAN II MOBILE (WIDEBAND)£24.95 PLUS £6.00P+P
*TYPE: TWIN COIL *FREQ:25-2000 MHZ *LENGTH: 65cm
*BASE:MAGNETIC *CABLE: 4m WITH BNC

SKYSCAN MOBILE (WIDEBAND).....£19.95 PLUS £6.00 p+p
*TYPE:4 WHIPS *FREQ:25-2000 MHZ *LENGTH:65cm
*BASE:MAGNETIC *CABLE:4m WITH BNC

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Open Days

The 'Radio Hut' at the Muckleburgh Collection, Norfolk's largest military museum, will be open to the public for more days each week during the 2004 season. The museum itself is open daily from Easter to the end of October and during this period the radio hut, manned by volunteer members of the **North Norfolk Amateur Radio Group** (NNARG), will be open Wednesdays, Thursdays, Sunday afternoons and Bank Holidays.

During the winter, the Group has rearranged its collection of vintage communications equipment into separate, identifiable, sections, including a pre-radio section with items such as the heliograph, Aldis lamp, the field telegraph and a working representation of the Australian Overland telegraph of 1870-72.

Radio exhibits cover the early days of broadcasting, a wide range of army, navy, airforce

and clandestine equipment and two operational amateur stations, one QRP and one QRO, using permanent special event callsign GB2MC. Other exhibits include a computer simulation of the last messages from the *Titanic* and the history of Morse telegraphy.

Visitors to the hut are greeted by members of the Radio Group who explain and demonstrate, where possible, the exhibits in this prestigious collection. Children are made especially welcome. They are shown how to send their names in Morse and are awarded a certificate to mark their achievement. The Group also welcomes like-minded enthusiasts, living within striking distance of the museum, who would like to join them in their interesting voluntary activities.

The Muckleburgh Collection opens daily at 1000 and is located on the A149 coast road at Weybourne, in North Norfolk. Admission rates to the museum - which include admission to the radio hut - are Adults £5.50, Senior Citizens £4.50, Children £3 and a Family ticket costs £13.50.

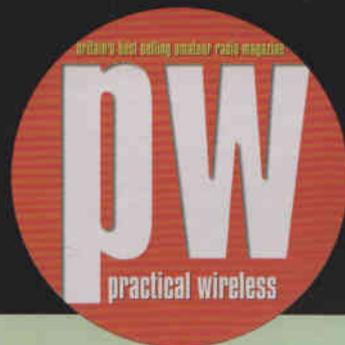
Radio Amateurs on holiday in North Norfolk are made most welcome if they identify themselves to Group members when visiting the radio hut. They are also welcomed if they call into the NNARG weekly 'net' on Thursdays at 1900 local time on 144.775MHz. Additionally, when the hut is open, the Group monitors 145.500MHz to provide talk-in facilities for Amateurs seeking directions to reach the museum.

A visit to Muckleburgh makes a good day out, as a day trip, a club outing or a family visit. It has many interesting features, a nice restaurant and for any radio enthusiast a visit to the radio hut is a real bonus.

More information about NNARG at Muckleburgh can be found on www.northnorfolk.org/nnarg The Group's PRO is **Tony Smith G4FAI**, QTHR. The Muckleburgh Collection's own website is at www.muckleburgh.co.uk

Dover Radio Club

Members of the **Dover Radio Club** meet every Wednesday at 1930 during term time in the Dover Boy's Grammar School. The School is a centre for the Foundation Course, the Intermediate Training Course, as well as the Morse Training & Assessment Centre. The club is liaising with the Management of Dover Castle at present and will be putting on a Special Event Station on the 5/6 June to commemorate the D-Day landings 60 years ago. The callsign will be **GB60FS** (Operational Fortitude South). Further information at www.darc.org.uk



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CAN YOU AFFORD TO MISS IT? JUNE ISSUE ON SALE 13 MAY...PLACE YOUR ORDER TODAY!

LM&S

Long, Medium & Short Wave Bands

- **Martin Peters** 11 Filbert Drive, Reading RG31 5DZ
- **E-mail:** lms@pwpublishing.ltd.uk

British Summer Time arrived on 28 March, and with it, scores of updated schedules from the international broadcasters. Most transmissions to Europe are now one hour earlier (UTC) with respect to the winter months. Many frequency management teams take the opportunity to activate transmitters on the higher frequency bands to take advantage of the summertime propagation.

Here then, is a clutch of summer schedules from a range of international broadcasters. All are English to Europe unless stated otherwise.

Kol Israel

Time	MHz
0700-0715	11.590, 9.435, 15.640 (from 1 May)
1310-1320	15.640, 17.535
2000-2015	15.640, 17.535, 11.605
2200-2225	17.535, 11.605, 15.640 (from 1 May)

Radio Bulgaria

Time	MHz
0630-0700	11.600, 13.600
1130-1200	11.700, 15.700
1730-1800	9.500, 11.500
2100-2200	5.800, 7.500

Radio Cairo

Time	MHz
2115-2245	9.990

Radio Prague

Time	MHz
0700-0727	9.880, 11.600
1030-1057	9.880, 11.615
1300-1329	13.580, 21.745
1600-1627	5.930
1700-1727	5.930
2000-2027	5.930

Radio Sweden

Time	MHz
1730-1800	1179kHz, 6.065 (Mon-Sat)
1930-2000	1179kHz, 6.065
2130-2200	1179kHz, 6.065, 9.925

Radio Tirana

Time	MHz
2130-2200	7.130
1845-1900	7.210, 9.520
2130-2200	9.540

Radio Ukraine

Time	MHz
2100-2200	7.420
0000-0100	7.545
0300-0400	7.545
1100-1200	15.415

Radio Vlaaderen International

Time	MHz
0700-0730	1512kHz, 5.985
1730-1800	1512kHz, 9.925
1730-1800	11.640
1930-2000	1512kHz, 9.925

RNZI Not to Europe

Time	MHz
0459-0705	9.615
0706-1059	9.885
1100-1259	9.885
1300-1850	6.095
1851-1950	9.885
1951-2050	11.725
2051-0458	15.720

Satisfying Catch

You'll notice that Restricted Service Licence (RSL) stations are now incorporated into the UK medium wave listing. Owing to their limited power and, in some cases, limited life span, these stations can make for a satisfying catch.

There are around 130 long term low power a.m. and f.m. stations dotted around the UK. They usually broadcast out of universities, hospitals and even prisons. The transmitters are in theory, only supposed to cover the site in question, with very little in the way of overspill. However, reports of up to hundreds of kilometres away have been received by a number of stations. The full listing can be found on the Ofcom website www.ofcom.org.uk It's also set out within the pages of *Radio Stations In The UK*, available from the British DX Club (BDXC). I can highly recommend it, and them.

In addition to the permanent stations, temporary, special event stations pop up for a maximum of 28 days. These outfits generally operate at higher power levels and are commonly configured to cover an entire town or community. As the list is always changing the only up-to-date information is on the web. But as I write, here's a few planned for April into May.

Service	MHz	On-air dates	Location	Event
Bairrigg FM	87.7	29/04 - 03/05	Lancaster	University's 40th
Cabvelley Radio	87.7	21/04 - 04/05	Liverpool	Community broadcast
Derwent FM	87.9	19/04 - 16/05	Derby	Community broadcast
Flame FM	87.9	03/05 - 30/05	Bradford	Pentecost
HLR	87.7	05/05 - 01/06	Hull	Trial service
Hartlepool FM	107.5	04/05 - 31/05	Hartlepool	Trial service
Hastings Rock	107.0	01/05 - 28/05	Hastings	Macmillan fund-raiser
Kerrang!	105.8	05/05 - 01/06	Liverpool	Trial service
LSR FM	106.6	27/04 - 24/05	Leeds	Student service
Lush FM	107.5	19/04 - 16/05	Leicester	Student service
Luton FM	87.9	01/05 - 28/05	Luton	Student service
Oscar Radio	96.3	24/04 - 09/05	Oundle	School broadcast
Priory FM	102.5	03/05 - 30/05	Grantham	Trial service
Radio Reverb	87.7	30/04 - 24/05	Brighton	Brighton Festival
Tube Radio	103.8	28/04 - 24/05	Ealing	Student service
WHAM! Radio	1.449	03/05 - 30/05	Blaenavon	World Heritage status

Simon Hockenull in Bristol managed to catch the Voice of America via their Kuwait relay one night on **1593kHz**. And during daylight hours, Belarusian Radio 1 on **279kHz**. Quite a haul.

Whist on the subject of long wave, regular monitors of the band can't fail to have noticed Ireland's return to the band. RTE Radio 1 via the ex-Atlantic 252 transmitter in Clarkestown officially launched on 17 March, St. Patrick's Day. The station is well received here in the south of England during the day. Battle commences in the evening, when the transmitter drops to low power and Algerian Radio fades in.

Still with RTE, they recently announced the April closure of their a.m. outlets of second service, 2FM. The **1278kHz** transmitter in Dublin is already shut down, and the Cork relay - also on **1278kHz** - is probably off the air as you read this. Finally, the **612kHz** transmitter in Athlone is also due for closure meaning that this particular spot on the dial, familiar to countless numbers over the decades, is destined to lose its constant companion.

The **567kHz** Radio 1 transmitter at Tullamore is all that remains of RTE's medium wave presence and even this is down for repair right now.

As predicted in last month's 'Bandscan Europe' column, VOA News Now, the Voice of America's global English-language service, reduced many of its transmissions at the beginning of the seasonal time change. All part of a cost-cutting exercise by the US Broadcasting Board of Governors.

News Now broadcasts to all parts of the globe are being either scaled down or eliminated completely, as is the case with those previously targeting Europe and the USA itself. Further cuts are expected in October. Get your QSL cards while you can...

Arman FM, Afghanistan's first commercial radio station, now has a presence on the Internet. The station broadcasts to Kabul on **98.1MHz** but you can also hear selected

Local Radio Table

kHz	Service	Svc area/TX site	kW	SWL
558	Spectrum	Crystal Palace	1	A,B,C*,D,E
603	Capital Gold	Littlebourne	0.1	A,B,D,E
630	BBC 3CR	Luton	0.2	A,B,D,E
657	BBC Radio Cornwall	Bodmin	0.5	E
666	BBC Radio York	York	0.5	E
666	Classic Gold	Exeter	0.34	A,D,E
729	BBC Essex	Manningtree	0.2	A,B,E
738	BBC Hereford & Worcester	Worcester	0.037	A,D,E
756	Magic Maldwyn	Newtown	0.63	A
765	BBC Essex	Chelmsford	0.5	A,B,D,E
774	BBC Radio Kent	Littlebourne	0.7	A,B,E
774	Classic Gold	Gloucester	0.14	A
792	Classic Gold	Bedford	0.275	A,B,E
801	BBC Radio Devon	Barnstaple	2	B,D,E
828	Classic Gold	Bournemouth	0.27	B,D
828	Classic Gold	Luton	0.2	A,D,E
828	BBC Asian Network	Wolverhampton	0.2	D
828	Magic 828	Leeds	0.12	F*
837	BBC Asian Network	Leicester	0.5	A,B,D,E
855	BBC Radio Norfolk	Norwich	1.5	B,E
855	Sunshine 855	Ludlow	0.15	A,D,F*
873	BBC Radio Norfolk	West Lynn	0.3	A,B,E
936	Fresh AM	Skipton	1	E
936	Classic Gold	West Wiltshire	0.18	A,E
945	Capital Gold	Bexhill	0.7	B,C,F*
945	Classic Gold	Derby	0.2	A
954	Classic Gold	Torbay	0.4	D,E*
954	Classic Gold	Hereford	0.16	A,D
963	Asian Club	Hackney	0.95	A,B,D,E,G*
972	Asian Club	Southall	1	A,B,D,E,G*
990	BBC Radio Devon	Exeter	1	D,G*
990	Magic AM	Doncaster	0.25	E
990	Classic Gold	Wolverhampton	0.09	A,D
999	BBC Radio Solent	Fareham	1	B,C,D
999	Valleys Radio	Ebbw Vale	0.3	D
999	Classic Gold	Nottingham	0.25	A
1017	Classic Gold	Shropshire	0.63	A,D
1026	BBC Radio Jersey	Trinity	1	D
1026	BBC Radio Cambridgeshire	Cambridge	0.5	A,B,D,E
1035	Easy Radio London	Crystal Palace	1	A,B,C*,D,E
1035	BBC Radio Sheffield	Sheffield	1	E
1035	West Sound	Ayr	0.32	F
1116	BBC Radio Derby	Derby	1	A,E,F*
1116	Valleys Radio	Ebbw Vale	1	D
1116	BBC Radio Guernsey	Rohais	0.5	D
1152	LBC	London	23.5	B,E
1152	Capital Gold	Birmingham	3	A,D
1152	Classic Gold Amber	Norwich	0.83	E
1161	BBC Southern Counties Radio	Bexhill-on-Sea	1	A
1161	BBC 3 Counties Radio	Bedford	0.1	B,E
1170	Swansea Sound	Swansea	0.58	D
1170	Classic Gold Amber	Ipswich	0.28	G*
1170	Signal's Big AM	Stoke on Trent	0.2	A,E
1170	Capital Gold	Portsmouth	0.12	B,D
1242	Capital Gold	Maidstone	0.32	B,C
1251	Classic Gold Amber	Bury St Edmunds	0.76	E
1260	Sabras Sound	Leicester	0.29	A
1278	Classic Gold	Bradford	0.43	E
1287	Radio Redhill (RSL)	Redhill	0.001	B
1287	Radio Grendolen	Leicester Gen Hosp	0.001	E
1296	Radio XL	Birmingham	10	D,E,F
1305	Premier	London	0.5	A,B,E
1305	Capital Gold	Newport	0.2	E
1323	BBC Bristol & Somerset	Taunton	0.63	E
1323	Capital Gold	Southwick	0.5	B,E
1332	Premier	Central London	1	F*
1332	Classic Gold	Peterborough	0.6	A,B,E
1332	BBC Wiltshire Sound	Laocpk	0.3	F*
1350	Cambridge University Radio (RSL)	Cambridge	0.001	E
1350	Mid Downs Radio (RSL)	Haywards Heath	0.001	B
1359	BBC Radio Solent	Bournemouth	0.85	G*
1359	Classic Gold	Coventry	0.27	A
1368	BBC Lincolnshire	Lincoln	2	A,E
1368	Southern Counties Radio	Duxhurst	0.5	B
1368	BBC Wiltshire Sound	Swindon	0.1	F*
1413	BBC Radio Gloucestershire	Berkeley/Bourton	0.5	A
1413	Premier	London	0.5	B,E,F*
1431	Classic Gold	Southend	0.35	B,E
1431	Classic Gold	Reading	0.14	A,D,E,F*
1449	BBC Asian Network	Peterborough	0.15	A,E
1458	Sunrise	London	125	A,B,E,F*
1458	BBC Asian Network	Birmingham	5	D
1458	BBC Radio Cumbria	Whitehaven	0.5	F
1485	BBC Radio Humberside	Hull	2	E
1485	BBC Radio Merseyside	Wallasey	2	F*
1485	Classic Gold	Newbury	1	A,D
1485	BBC Southern Counties Radio	Brighton	1	B
1503	BBC Radio Stoke	Staffordshire	1	A,C,E,F*
1521	Classic Gold	Reigate/Crawley	0.64	B,C*,F*
1530	Capital Gold	Worcester	0.52	A,D,F*
1530	BBC Radio Essex	Southend	0.15	B,C*,E
1548	Capital Gold	London	97.5	A,B
1548	BBC Bristol & Somerset	Bristol	5	E
1548	Magic AM	Sheffield	0.74	F*
1557	Capital Gold	Southampton	0.5	A,F*
1557	BBC Radio Lancashire	Lancaster	0.25	E,F*
1566	County Sound	Guildford	0.8	A,B,C*,E,F*
1566	BBC Somerset Sound	Taunton	0.6	F*
1575	Stoke Mandeville Hospital R (RSL)	Stoke Mandeville	0.0001	E
1584	BBC Radio Nottingham	Nottingham	1	A,F*
1584	BBC Hereford & Worcester	Wooferton	0.3	D
1584	Turkish Radio	London	0.2	B
1602	BBC Radio Kent	Rustall	0.25	B,F*

* = dark

Listeners:

A	Fred Wilmshurst, Northampton
B	R Illman, Oxted
C	Sheila Hughes, Morden
D	Simon Hockenhill, Bristol
E	Ernie Strong, Ramsey, Cambs
F	Eddie, McKeown, Newry
G	Geraint Gill, Llanfairfechan

programmes by visiting their English-language website, where you'll also find their schedule and even the Afghan Top 40 www.arman.fm

Some news, courtesy of the Medium Wave Circle: Belgium's RTBF's 1125kHz transmitter in Houdeng now carries a new station, *Vivacite*, replacing *Frequence Wallonie*. Two other frequencies, 1233 and 1305kHz, still carry Radio 21 but in a few weeks' time will split services; Classic 21, which will cater for older pop and rock music fans, and Pure FM, a new, youth oriented station.

So, how do you like the new-style presentation? Comments so far have been 100% positive. Thanks to those of you who have taken the trouble to let me know your thoughts. Especially to **Ian Evans** in Gwent. He was the first to take time out to drop me a line saying how much he enjoyed the new format. Much appreciated, Ian, and I look forward to adding in some logs from you soon!

One possible refinement I'm considering is to break the short wave table up into

Long Wave Table

kHz	Service	TX Location	Country	Power (kW)	Listener
153	Radio Romania	Brasov	ROU	1200	A*
153	RTA 1	Bechar	ALG	1000	A*,E*
153	Deutschlandfunk	Donebach	D	500/250	A*,B,C*,D,E,F*
162	France Inter	Allouis	F	2000/1000	A*,B,C*,E,F*
171	Medi 1	Nador	MRC	2000	A*,D*,E,F*
171	Radio Chechnya	Tbilisskaya	RUS	1200	E*
171	Radio Rossi	Bolsakovo	RUS	600	A*,C*,D*,F*
177	Deutschlandradio Berlin	Zehlendorf	D	500	A*,B,C*,D,E,F*
183	Europe 1	Saarlouis	D	2000	A*,B,E,F*
189	Georgian Radio 1	Tbilisi	GEO	500	E
189	Rikisutvarpid	Gufuskalar	ISL	150	A*,D*,E,F*
189	RAI Uno	Caltanissetta	I	10	A*
198	BBC Radio 4	Droitwich	UK	500	C*,E,F*
207	RTM Network A	Azilah	MRC	400	D*,E
207	Deutschlandfunk	Ahliming	D	500	A*,B,E,F*
207	Rikisutvarpid	Eidar	ISL	100	A*,D*,E*,F*
216	Radio Monte Carlo	Roumoules	F	1400	A*,B*,D*,E,F*
216	Radio Rossi	Krasnoyarsk	RUS	150	E*
225	Polish Radio 1	Solec, Kujawski	POL	1000	A*,C*,D,E,F*
225	Turkish Radio 4	Van	TUR	600	A*,E*
234	RFL	Junglinster	LUX	2000	B*,C*,E,F*
243	Denmark Radio 1	Kalundborg	DNK	300	A*,C*,D*,E,F*
252	Algiers Radio 3	Tipaza	ALG	1500/750	A*,B*,C*,D,E,F*
261	Radio Rossi	Taldom	RUS	2500	A*,C*,D*,E,F*
261	Radio Horizont	Sofia	BUL	40	E*
270	Czech Radio 1	Uherske-Hradiste	TCH	650	A*,D*,E,F*
279	Belarusian Radio 1	Sasnovy	BLR	500	A*,C*,D,E,F*
279	Radio Rossi	Yekaterinburg	RUS	150	F*

* = dark

Listeners:

A	Jim Edwards, Wigan.
B	Thomas Williams, Truro.
C	Sheila Hughes, Morden.
D	Simon Hockenhill, Bristol.
E	Ernie Strong, Ramsey, Cambridgeshire.
F	Eddie, McKeown, Newry.

hourly blocks. If you use 'LM&S' as a handy reference whilst you listen you could then simply glance down to the time slot in question and read off the relevant information for that hour. Let me know what you think. In the meantime have a good month, happy listening and I'll see you next time.

Tropical Band Table

MHz	UTC	Service	Country	Language	Listener
3.200	2035	Trans World Radio	MCO/SWZ		C
3.210	0350	WWCR Nashville	USA	Eng	A,B,C,E,F
3.215	0005	Adventist World Radio	G/MDG		C
3.223	0055	All India Radio, Simla	IND		C
3.240	0307	Trans World Radio	MCO/SWZ	Nda	A
3.240	0320	TWR Manzana	MCO/SWZ		C
3.255	0352	BBC World Service	G/AFS	Eng	A,C,K
3.279	0245	La Voz Del Napa	VEN		C
3.306	0146	Zimbabwe Broadcasting	ZWE		C
3.315	0055	All India Radio, Bhopal	IND		C
3.320	2340	SABC Meyerton	AFS		C,K
3.346	0310	Channel Africa	AFS		C,K
3.366	1715	All India Radio, Delhi	IND		C
3.380	0055	All India Radio, Gantok	IND		C
3.915	1620	BBC World Service	G/SNG	Eng	A,C,E,K
3.945	1545	All India Radio, Gorakhpur	IND		C
3.950	2310	PBS Xinjiang	CHN		C,J
3.955	1837	Radio Taiwan Int.	TWN/G	Eng	A,D,J,K
3.955	2202	Radio Korea Int.	KOR/G		A,D,J,K
3.965	2116	Radio France Int.	F	Fre	A,I,K
3.975	2024	Radio Budapest	HNG	Eng	A,D,J
3.980	1909	Radio Free Europe	USA/D	Ukr	A,I,K
3.990	1550	PBS Xinjiang	CHN		C
3.995	1910	Deutsche Welle	D	Ger	A,E,I,K
4.005	0348	Vatican Radio	CVA	Sto	A,B,E,I,K
4.190	2250	CNR Minority Prog	CHN		C
4.330	1735	PBS Xinjiang	CHN		C
4.460	1555	CHN Radio 1	CHN		C
4.500	1705	PBS Xinjiang	CHN		C
4.635	2230	Radio Tajikistan	TAJ		C,E
4.750	2310	PBS Xizang	CHN		C,E,K
4.750	0022	All India Radio, Port Blair	IND		K
4.765	0145	Radio Educacao Rural	B		C
4.765	0050	All India Radio, Port Blair	IND		C
4.765	0055	Radio Emissora	B		C
4.770	0430	FRON Kaduna	NG		B,C,E,K
4.775	1545	All India Radio, Imphal	IND		C
4.775	0405	Trans World Radio	SWZ		C
4.783	2335	RTM Bamoko	MU		C,E
4.790	1540	All India Radio, Itanagar	CHN		C
4.800	2215	CPBS 2 Beijing	CHN	Chi	A,C,E,K
4.800	2315	LNBS Massem	LSO		C
4.800	0055	All India Radio, Hyderabad	IND		C
4.805	0100	Radio Df Do Amaganas	B		C
4.810	0415	Voice of Armenia	ARM		B
4.815	0120	Radio Difusora Londrina	B		C
4.820	2213	Xizang Lhasa	CHN	Chi	A,C,E,K
4.820	0115	All India Radio, Kolkata	IND		C
4.830	1710	All India Radio, Jammu	IND		C
4.830	2215	Radio Tachira	VEN		C
4.830	0010	Radio Ulan Bator	MNG		C
4.835	2218	RTM Bamoko	MU		A,C,E,K
4.840	1705	All India Radio, Mumbai	IND		C
4.845	2210	ORTM Nouakchott	MTN	Ara	A,B,C,E,K
4.850	0005	All India Radio, Kohima	IND		C,K
4.860	1919	All India Radio, Delhi	IND	Urd	A,C,E,K
4.865	0140	Radio Alvorado Londrina	B		C

MHz	UTC	Service	Country	Language	Listener
4.875	0110	Radio Df Roraima	B		C
4.880	1705	All India Radio, Lucknow	IND		C
4.885	2255	Radio Clube Do Para	B		C
4.885	0135	Radio Df Acreana	B		C
4.890	0437	Radio France Int'l	F/GAB	Fre	A,B
4.895	0015	Radio Ulan Bator	MNG		C
4.895	0055	All India Radio, Kurseong	IND		C,E,K
4.905	2208	Xizang TB	CHN	Tib	A,C,E,K
4.910	1735	All India Radio, Jaipur	IND		C
4.910	1750	Radio Zambia	ZMB		B,C,E,K
4.915	2015	GBC 1 Accra	GHA		C,E,K
4.915	2305	Radio Anhanguera	B		C
4.915	0445	Radio Difusora, Macapa	B	Por	A
4.920	2207	Xizang TB Lhasa	CHN	Tib	A,C,E,K
4.920	1710	All India Radio, Chennai	IND		C
4.930	2235	All India Radio, Shimla	IND		E
4.935	0414	Radio Capizaba	B		C
4.940	1651	Voice of Russia	RUS	Eng	A
4.940	1535	All India Radio, Guwahati	IND		C
4.945	2325	Emissora Rural	B		C
4.950	2027	Voice of America	USA/STP	Eng	A,C,J,K
4.950	0055	All India Radio, Srinagar	IND		C
4.960	0105	All India Radio, Ranchi	IND		C
4.960	0405	Voice of America	USA/STP		B
4.970	0055	All India Radio, Shillong	IND		C
4.975	1845	Radio Uganda, Kampala	UGA		C
4.980	2345	PBS Xinjiang	CHN		C,K
4.985	2310	Radio Brasil Central	B		C,E
4.990	0115	All India Radio, Itanagar	IND		C
5.010	0045	All India Radio, Thirupuram	IND		C,E,K
5.015	0240	Radio Pioneira	B		C
5.025	2130	Radio Uganda	UGA		C,E,K
5.025	2154	Radio Tashkent	UZB	Eng	A
5.025	0029	Radio Parakou	BEN		K
5.025	0408	Radio Rebelde	CUB	Spa	A,C
5.030	2335	Radio Burkina	BFA		C,E,K
5.035	0235	Radio Aparecida	B		C
5.040	1705	All India Radio, Jopore	IND		C,E,K
5.060	1540	Voice Of The Strait	CHN		B,C,E,K
5.060	2300	Radio Nepal	NPL		C
5.060	2315	P			

Medium Wave Table

kHz	Service	Location	Country	kW	Listener	kHz	Service	Location	Country	kW	Listener
531	RTA 1	Ain-E-Beida	ALG	600/300	C*E*	1197	VOA/RFE	Munich	USA/D	300/150	C*E*
531	Schweizer Radio	Basel	SUI	600	C*E*	1197	Virgin Radio	Many	G	0.2-2	E*
531	Uwary Foroy	Akreburg	FRU	100	C	1205	France Info	Bordeaux	F	300	C*E*
540	Kossuth Radio	Solt	HNG	2000/1000	C	1215	Virgin Radio	Many	G	0.32-200	E*
540	Radio Twee	Wavre	BEL	150	A,B,C,E*F*	1224	Radio Horizont	Vidin	BUL	500	F*
549	RTA 1	Hamadouche	ALG	600/300	E*	1224	COPE	Many	E	2	F*
549	Mayak Radio	Sasnovy	RUS/BLR	500	E*	1233	Virgin Radio	Many	G	0.1-0.5	E*
549	Deutschlandfunk (DLF)	Thurnau	D	100	C	1242	Virgin Radio	Many	G	0.5-2	E*
549	UCB Europe	Dundalk	IRL	70	E	1251	Radio 747	Hulsberg	HOL	10	C*E*
567	RTE Radio 1	Tullamore	IRL	500	A,C,E,F	1260	SER	Many	E	5	F*
576	Sudwestrundfunk (SWR)	Mühlacker	D	100	C,E,F	1260	Virgin Radio	Lydd	G	1	A
576	RNE 5	Barcelona	E	100	C*E*F*	1269	Deutschlandfunk (DLF)	Neumunster	D	300	C*E*F*
585	RNE 1	Madrid	E	600	C*E*F*	1278	France Info	Strasbourg	F	300	C*E*F*
585	FP	Paris	F	8	E	1278	RTE Radio 2	Cork/Dublin	IRL	10	E*F*
585	BBC Radio Scotland	Dumfries	G	2	F	1287	Radio Leida	Lieida	E	10	F*
594	Radeioli Renaissance	Muge	POR	100	A,E*F*	1296	BBC World Service	Orlondess	G	500	C*E*F*
594	RTM Network A	Dujda	ALG	100	E*	1305	RNE 5	Many	E	10-25	F*
603	France Info	Lyon	F	300	C*E*	1314	NRK Europakanalen	Kvitsoy	NOR	1200	C*E*F*
603	RNE 5	Seville	E	50	C*E*	1323	Voice of Russia	Wachentrurn	RUS/D	800/150	C*E*F*
603	BBC Radio 4	Newcastle	G	2	E*F*	1332	RAI Uno	Rome	I	300	C*E*F*
612	RTE 2	Athlone	IRL	100	A,C,E*F*	1341	BBC Radio Ulster	Lurganagarvey	G	100	B*,C*,E
621	RNE 1	Many	E	10-50	E*	1350	TransWorld Radio	Gavar	MCO/ARM	1000	G*
621	ERTU Voice of the Arabs	Batra	EGY	1000	E*	1359	RNE3	Madrid	E	600	C*E*F*
621	RTBF 1	Wavre	BEL	300	A,B,C,E*F*	1368	France Info	Douglas, IOM	F	200	F*
630	RTI National Network	Tunis-Djedeida	TUN	600	F*	1377	Voice of Russia	Lille	F	300	A,C*E*F*
630	NRK Europakanalen	Vigra	NOR	100	F*	1386	Voice of Russia	Botshakovo	RUS	1200	C*F*
639	RNE 1	Many	E	10-300	A,E*F*	1385	TransWorld Radio	Filake	MCO/ALB	500	F*
648	BBC World Service	Orlondess	G	500	A,B,C,E*F*	1385	Radio 10 FM	Trinthalhaven	HOL	120	C,E,F
648	RNE 1	Madrid	E	10	F*	1404	France Info	Brest	F	20	E*F*
657	RNE 5	Madrid	E	50	C*E*	1413	RNE 5	Many	E	5-10	F*
657	BBC Radio Wales	Wrexham	G	50	A,C,E*F*	1422	DLF	Heusweiler	D	1200/600	A,C*E*F*
666	Radio Vatinius 1	Sriaujai	LIT	500	F*	1422	RTA Cultural Channel	D. Fayet	ALG	40	A
666	Sudwestrundfunk (SWR)	Rohrdorf	D	150	C*F*	1440	RTL	Marnach	LUX	1200/300	A,C*E*F*
666	RDP Antena 1	Lisbon	POR	10	E*F*	1440	BKSA General Service	Dammen	ARS	1600	F*
675	Arrow Classic Rock	Lopik	HOL	120	A,B,C,E*F*	1449	RAI Due	Squinzano	I	50	C*E*F*
684	RNE 1	Seville	E	600	C*E*	1449	BBC Radio 4	Rednoss	G	2	F*
684	BBC Radio Five Live	Droitwich	G	150	E*F*	1458	Reshet Alef	Eilat/Jerusalem	ISR	10	E*
702	Radio Slovensko	Banska Bystrica	SVK	400	C	1467	TransWorld Radio	Romoules	F	1000	F*
702	RAI Due	Monte Carlo	VMCO	40	A*E*F*	1467	Various relays	Maiac	MDA	1500	F*,G*
702	Deutschlandfunk (DLF)	Flensburg	D	5	F*	1476	Radio 1476	Vienna	AUT	60	F*,G*
711	Radio Bleu	Rennes	F	300	C*E*F*	1485	SER	SER	E	2.5	E*
720	Westdeutscher Rundfunk (WDR)	Langenberg	D	85	E*	1494	Voice of Russia	Krasny-Bor	RUS	600	F*
720	BBC Radio 4	Llanagarvey	G	10	A*E*F*	1494	France Info	Clemon-Ferrand	F	20	A,C*E*F*
720	BBC Radio 4	London	G	0.75	A,C*E*	1503	VPR Radio Saranya	Bushahr	IRN	500	F*
729	RNE 1	Many	E	10-100	C*E*	1512	Radio Eury/VI	Wolverham	BEL	300/25	C*E*F*
729	RTE Radio 1	Cork	IRL	10	C*E*F*	1530	Vatican Radio	Vatican City	VVA	150/450	B*,C*,E*F*
738	RNE 1	Barcelona	E	500	C*E*F*	1539	Evangeliums Rundfunk	Mairfingens	G	700/120	C*E*F*
738	Radio France International	Paris	F	5	C*E*F*	1557	France Info	Nica	F	300	C*E*F*
747	Radio 747	Revoland	HOL	400	B*E*F*	1575	RAI Uno	Genova	I	50	A,C*E*F*
756	Deutschlandfunk (DLF)	Braunschweig	D	200	C*E*F*	1575	SER	Many	E	5	C*E*F*
756	Radio Euskadi	Bilbao	E	25	C*E*	1584	SER	Many	E	2	E*
765	Option Musique	Sottens	SUI	60	B*,C*F*	1593	Voice of America	Kuwait	USA/KWT	150	C*E*F*
774	RNE 1	Many	E	20-100	C*E*F*	1602	Radio Vatinius	Vatinius	E	25	C*E*F*
774	BBC Radio 4	Ernstkullen	G	1	F*	1611	Vatican Radio	Vatican City	VVA	100	F*
783	MDR Info	Leipzig	D	100	C*E*F*						
783	Radio Miramar	Barcelona	E	50	E*						
792	France Info	Limoges	F	300	C*E*						
792	Deutschlandfunk (DLF)	Lingen	D	5	F*						
801	Bayern 1	Munich-Ismaning	D	100	F*						
810	Radio Scotland	Westerglen	G	100	A*,B*,C*E*F*						
810	Radio Madrid	Madrid	E	50	C*E*						
819	ERTU General Programme	Batra	EGY	450	E*						

* = dark

- Listeners:
 A Rhoderick Illman, Oxford.
 B Sheila Hughes, Morden.
 C Simon Hockenhill, Bristol.
 D Clare Pinder, Appleby.
 E Eric Strong, Ramsey, Cambs.
 F Eddie, McKeown, Newry.
 G Geraint Gill, Lanfairfechan.

Short Wave Table

MHz	UTC	Service	Country	Lang	SINPO	SWL	MHz	UTC	Service	Country	Lang	SINPO	SWL
5.745	2205	WHRI, South Bend	USA	Eng	25444	FW	6.065	2030	Radio Sweden Int.	S	Eng	35544	FW
5.745	0205	WHRI, South Bend	USA	Eng	54444	BC	6.065	2256	Radio Sweden Int.	S	Eng	33333	PH
5.745	0835	WHRI, South Bend	USA	Eng	44333	SH	6.075	1541	Deutsche Welle	D	Ger	55555	FP
5.745	0858	WHRI, South Bend	USA	Eng	34333	SE	6.075	2106	Deutsche Welle	D	Ger	55555	FW
5.775	2024	IRRS	I	Eng	44132	EM	6.075	0915	Deutsche Welle	D	Ger	44434	SE
5.800	1852	Radio Bulgaria	BUL	Eng	45444	SH	6.085	1930	Bayerischer Rundfunk	D	Ger	55555	SE
5.800	2200	Radio Bulgaria	BUL	Eng	55555	VP	6.085	0916	Bayerischer Rundfunk	D	Ger	44333	SE
5.800	2228	Radio Bulgaria	BUL	Eng	55555	EM	6.100	2224	RSCG, Belgrade	YUG	Eng	44333	EM
5.800	2256	Radio Bulgaria	BUL	Eng	35544	FW	6.110	1545	The Overcomer Ministry	USA	Eng	34443	PP
5.810	2115	Radio Canada Int.	S	Eng	35444	FW	6.110	2035	Radio Romania Int.	ROU	Eng	32432	EM
5.825	0020	WEWN, Birmingham	USA	Eng	54444	BC	6.120	0919	YLE Radio	FIN	Fin	34333	SE
5.825	0805	WEWN, Birmingham	USA	Eng	54533	SE	6.140	1405	Deutsche Welle	D	Eng	55545	BC
5.825	0812	WEWN, Birmingham	USA	Eng	45344	EM	6.140	1538	Deutsche Welle	D	Eng	44444	PP
5.825	0825	WEWN, Birmingham	USA	Eng	35454	MC	6.140	0707	Deutsche Welle	D	Eng	45555	EM
5.825	0859	WEWN, Birmingham	USA	Eng	34433	SE	6.140	0922	Deutsche Welle	D	Eng	44444	SE
5.840	2227	Radio Ukraine Int.	UKR	Eng	35333	SH	6.145	2028	Voice of Russia	RUS	Eng	55555	EM
5.840	2233	Radio Ukraine Int.	UKR	Eng	44343	EM	6.150	1730	Radio Singapore	SNG	Eng	54333	CP
5.850	2100	Radio Canada Int.	CAN/G	Eng	34333	GG	6.155	1535	Radio Austria Int.	AUT	Ger	44444	PP
5.850	2100	Radio Canada Int.	CAN	Eng	44434	TW	6.155	1932	Radio Austria Int.	AUT	Ger	44533	SH
5.850	2107	Radio Canada Int.	CAN	Eng	34232	EM	6.155	2010	Radio Austria Int.	AUT	Ger	55555	PP
5.850	2135	Radio Canada Int.	CAN	Eng	44444	TW	6.155	0923	Radio Austria Int.	AUT	Ger	44333	SE
5.850	2140	Radio Canada Int.	CAN/S	Eng	43333	SE	6.165	0145	Radio Nederland	HOL/ATN	Eng	44444	DH
5.850	2228	Radio Canada Int.	CAN	Eng	44444	PH	6.165	0924	Croatian Radio	HRV	Cro	24232	SE
5.855	1711	Trans World Radio	MCO/ARM	Eng	32222	EM	6.175	1848	Voice of Russia	RUS	Eng	53554	MC
5.865	1932	Voice of Greece	GRC	Eng	45454	EM	6.175	1930	Voice of Russia	RUS	Eng	33432	SH
5.865	2000	Radio Bulgaria	BUL	Ger	55555	PP	6.175	0105	Voice of Vietnam	VTN	Eng	43334	BC
5.880	0900	Vatican Radio	VVA	Ita	34333	SE	6.185	2215	RSCG	YUG	Eng	33333	TW
5.895	1722	Vatican Radio	VVA	Eng	45454	EM	6.190	0929	Deutschlandfunk	D	Ger	44333	SE
5.900	2100	Radio Prague	TCH	Eng	35544	FW	6.195	1521	BBC World Service	G	Pas	44444	SE
5.910	1846	Radio Vlaanderen Int.	BEL	Eng	55555	EM	6.195	2003	BBC World Service	G	Eng	55545	EM
5.910	1848	Radio Vlaanderen Int.	BEL	Eng	34433	SH	6.195	2224	BBC World Service	G	Eng	54554	MC
5.910	2000	Radio Slovakia Int.	SLK	Eng	55555	CP	6.200	2015	BBC World Service	G	Eng	44444	PP
5.915	1935	Radio Slovakia Int.	SLK	Eng	45444	SH	6.220	1529	V O Islamic Republic of Iran	IRN	Aze	33342	SE
5.915	1945	Radio Slovakia Int.	SLK	Eng	43422	EM	6.235	1932	Voice of Russia	RUS	Eng	45433	SH
5.915	1956	Radio Slovakia Int.	SLK	Eng	33333	PH	6.235	2000	Voice of Russia	RUS	Eng	33333	PP
5.920	0804	WBOH	USA	Eng	24332	SE	6.235	2005	Voice of Russia	RUS	Eng	35343	MC
5.930	1659	Radio Prague	TCH	Eng	55555	MC	6.235	2027	Voice of Russia	RUS	Eng	34132	EM
5.930	1710	Radio Prague	TCH	Eng	55354	EM	6.235	2110	Voice of Russia	RUS	Eng	54444	TW
5.930	2102	Radio Prague	TCH	Eng	45544	FW	6.235	2120	Voice of Russia	RUS	Eng	44434	TW
5.930	2109	Radio Prague	TCH	Eng	45444	SH	6.280	1533	WYFR	USA/TWN	Eng	23231	SE</

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A brilliant new compact indoor antenna that covers 0.1-3GHz and is just 24" when collapsed. Features "horizontal or vertical" adjustable elements. Ideal for table top mounting or by the window. Patch lead with BNC plug fitted. (Frequency range: 0.1-3GHz).

£59.95 P&P £6.00

Q-TEK SS-2000



Compact - indoor/outdoor scanning antenna. (50MHz-2.6GHz). Superb glass fibre construction. Ideal in areas affected by "nosey neighbour syndrome". This antenna can be put in the loft or outside on the building. SO-239 socket (PL-259 plug needed) 1.3m long (mast clamps supplied).
 50MHz-2.6GHz and under 1.3m long

£49.95 DEL £11.00

Q-TEK INTREPID 2000



An amazing vertical (glass fibre) colinear antenna. Quality construction with incredible performance. For the serious scanner enthusiast. *Freq range:* 0.5-2GHz. PL-259 fitting (not supplied). *Length* 3m. Mast clamps supplied. (Gain up to 9dB is easily obtained). Reports have shown this to be an excellent performer!

ONLY **£89.95** P&P £11.00

DX-500



It's unobtrusive and can be mounted almost anywhere!
 * High intercept point, low noise
 * Stainless steel construction
 * Static discharge protection (when earthed)
 * Height: 40cm, Dia: 35mm
 * Includes in-line low noise amplifier (240V) + 12m coax (can be extended)
 * Connectors supplied - PL-259 termination
 * Ideal for modern buildings & covert installation

ONLY **£279.00** P&P £11

AIRBAND AIR-44



(Airband base)
 Prof quality base antenna for AIRBAND. (Civil & military). With SO-239 fitting (1.7m long). Gain 4.5/7dB.

PROFESSIONAL QUALITY **£79.95** P&P £11.00

AIR-44N As above "N-type" fitting£84.95

AIR-33 (As above) 1m long. Gain 3/6dB.
£49.95 P&P £8.50

tempting items at just the right price

M-75 SCANNER PRE-AMP



Superb BNC in-line amplifier to boost signals! Fits on top of your scanner and away you go. (Powered by PP-3 battery - not supplied). *Freq:* 24MHz-2.1GHz. *Gain:* -10dB to +20dB.

£79.95 P&P £5
 Optional BNC patch lead£6.99

HUNTER



Frequency counter covers 10MHz-3GHz. Incl's nicad, charger, antenna.

ONLY **£59.95** P&P £6

Optional padded case.....£7.50

SUPER-GAINER RH-9090 (SMA)

SMA fitting
 SMA 40cm flexible whip that is ideal as replacement.

OUR PRICE **£26.95** P&P £1.50

SUPER-GAINER RH-9000 (BNC)

BNC 40cm flexible whip for the ultimate in gain. (Rx:- 25MHz-2GHz).

OUR PRICE **£21.95** P&P £1.50



THE UK SCANNING DIRECTORY

Britain's best selling scanner book now larger than ever. Nearly 700 pages packed full of frequencies from 25MHz-1.8GHz.

OUR PRICE **£19.75** P&P £5

QS-300



A fully adjustable desk top stand for use with all hand-helds. Fitted coaxial lead with BNC + SO239 connections.

£12.50 P&P £3.50

3 for **£30.00** P&P £7.50

QS-200



Superb quick fit dash mount for hand-helds.

£4.99 P&P £2.00

3 for **£10.00** P&P £4.50

items not to forget

ALKALINE STARTER KIT

Starter kit includes charger & 4 x AA cells. Was £12.99
£9.99 + £3.00 P&P.

Please note that only the special cells can be recharged with this charger.

Extra cells available @ 8 x AA pack £10.99 £1 P&P.
 4 x AA pack £5.99 £1 P&P. 4 x AAA £6.25 £1 P&P.
 Rechargeable Alkaline.

No memory effects. 1.5V cells. 3 x capacity of nicads.

SWAGED MAST SET

4 x 5' lengths of approx 2" extruded (16 gauge) heavy duty aluminium, swaged at one end to give a very heavy duty mast set.

TWO FOR £79.95
THREE FOR £109.95

OUR PRICE **£44.95** Del £10.00

2 for **£79.95** Del £12.50
 3 for **£109.95** Del £15.00

COPPER ANTENNA WIRE ETC

Enamelled (50m roll)£12.95 P&P £5
 Hard drawn (50m roll)£13.95 P&P £5
 Multi-Stranded (Grey PVC) (50m roll)£11.95 P&P £5
 Flexweave (H duty 50 mtrs)£30.00 P&P £5
 Flexweave H/duty (18 mtrs)£15.95 P&P £5
 Flexweave (PVC coated 18 mtrs)£18.95 P&P £5
 Flexweave (PVC coated 50 mtrs)£40.00 P&P £6
 Special 200mtr roll PVC coated flexweave£99.00 P&P £10
 Copper plated earth rod (4ft)£13.00 P&P £6
 Copper plated earth rod (4ft) + earth wire£18.99 P&P £6
 New RF grounding wire (10m pack) PVC coated£12.50 P&P £5

MAST HEAD PULLEY



A simple to fit but very handy mast pulley with rope guides to avoid tangling. (Fits up to 2" mast).

£8.99
 + P&P £2.50

30m pack nylon guy rope.....£10.00
 132m pack nylon guy rope.....£35.00

2nd hand selection

Alinco DJ-X3 as new£79.00
 Yaesu VR-500 as new£169.00
 MVT-7100 as new£169.00
 Alinco DS-X10 as new.....£179.00
 Icom R-3 as new.....£269.00
 Yupiteru MVT-9000 II as new.....£249.00
 FRG-100 very good condition, includes FM Unit£299.00
 Icom IC-R75 as new£529.00
 ICR8500 as new£849.00
 VR-5000 very good condition.....£399.00
 JRC NRD-525 VGC£349.00
 Fairhaven RD-500VX as new£629.00
 Icom IC-R72£299.00

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desktop scanners for less than you think



"Our Best Seller"

ICOM IC-R8500

Next generation wideband receiver for the true perfectionist. 0.1-2GHz. (All mode). The IC-R8500 is not simply a scanner, it's a professional quality communications receiver with versatile features from high speed scanning to computer control. (Requires software/lead). Includes free power supply.

SP-21 extension speaker.....£74.99
Voice synth board.....£34.95

Optional DSP speaker (SGC-ADSP2).....£99.95
Optional SGC-DSP circuit board.....£89.95
ICR-8500 "PlusII"....ICR-8500 + SP21 + Voice Synthesiser.....£1195.00

OUR PRICE
£1099.00
Delivery £10.00



AOR AR-5000A VERSION 2

A high performance fully featured receiver covering the frequency range of 10kHz-3GHz. This revised version has even greater enhanced performance offering professional quality at an affordable price.

New AR-5000A version 2 + 3.....£1699.00

OUR PRICE
£1499.00
Delivery £10.00



AOR AR-8600 MkII

Extremely versatile all mode receiver (100kHz-3GHz). AORs continual strife for perfection gives you this incredibly high performance receiver at a very affordable price. *Now with improved short wave performance.*

Optional power supply.....£19.99

OUR PRICE
£589.00
Delivery £10.00

hand-held scanners at realistic prices



ALINCO DJ-X2000

The intelligent scanner! 100kHz-2.15GHz. All mode incl SSB, "Flash Tune" reads frequency of nearby SSB, "Flash Tune" reads frequency of nearby SSB, "Flash Tune" reads frequency of nearby SSB. Amazing features include "Trasnsweeper" which helps locate hidden transmitters that may be used for eavesdropping. With 160 seconds of digital audio memory, you shouldn't miss that important transmission. The only thing you'll need is plenty of free time! Includes battery pack and charger unit.

Includes 8.33kHz spacing

Nothing was left out of this bundle

Optional case.....£15.99
Optional battery box.....£14.99
Cigar lead.....£19.99
PC interface.....£42.95

OUR PRICE
£419.95
Delivery £10.00



AOR AR8200MkIII

Never before has one hand portable offered so much.

- ★ Covers 100kHz-3GHz (all mode)
- ★ Computer control capability
- ★ 8-33kHz steps for the new airband spacing
- ★ Reaction tune capability
- ★ Includes nicads, charger/antenna and car lead.

AOR unexcused quality

Optional case.....£19.99
CC-8200 PC interface.....£79.99

OUR PRICE
£379.00
Delivery £10.00



ALINCO DJ-X10

Full-featured handy. 100kHz-2GHz all mode. Includes SSB/CW band scope, alphanumeric display plus loads more. (Includes battery/drop-in charger).

Simply a must - your own all medium wave

Optional case.....£15.99
Optional battery box.....£14.99
PC interface.....£42.95
Cigar power lead.....£19.99

OUR PRICE
£249.95
Delivery £10.00



FAIRHAVEN RD-500VX+

The best of British

Superb wideband receiver (all mode) with over 50,000 memories capable of holding text. 20kHz-1750MHz. Incl's remote control/power supply/PC lead and software. RRP: £899.00. Our in-house comparison tests have shown this unit to out perform those of double its price - a true professional receiver!

OUR PRICE
£699.99
Delivery £10.00



YAESU VR-5000

0.1-2.6GHz all mode receiver with (optional) DSP plus band-scope/world clock and too much more to print. (Incl's power supply).

Voice synthesiser£49.99
Voice recorder£49.99
Optional DSP£79.99
VR-5000 +3 (incls DSP + voice synth'r + record unit).....£699.99

OUR PRICE
£535.00
Delivery £10.00



UNIDEN UBC-780XLT

New comprehensive scanner (25-1300MHz) Alpha Tag, PC cloning control. Smart scanner + trunk track facility. Includes power supply. ARC-780XLT "Butel-Software" (works 95/98/ME/NT/XP)£34.99

RRP £349 OUR PRICE
£279.99
Delivery £10.00



GRE PSR-225

500 channel. 25-1300MHz. (25-550/760-1300MHz) AM/FM/WFM selectable. Includes power supply.

RRP £349 OUR PRICE
£199.99
Delivery £10.00



BEARCAT UBC-278

New base scanner with built-in clock radio. 25-956MHz (with gaps) 88-108MHz (WFM) 500kHz-1720kHz (AM). Fully programmable. Ideal for the bedroom.

OUR PRICE
£139.95
Delivery £10.00



YUPITERU MVT-7300

A superb wide-band (520kHz-1300MHz) AM/WFM/NFM/USB/LSB. Ideal for the pocket thanks to its compact size. (Runs on 3AA batteries).

Superb new addition to the Yupiteru family. One of which most people have been a member of!

Optional mains charger and batteries.....£14.99
Cigar lighter lead.....£9.99

A BARGAIN AT
OUR PRICE
£199.99
Delivery £10.00



YUPITERU MVT-7100

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.

Years of practice and this model still outsells almost any other handheld in its range.

Soft case for 7100EU/9000 - specify.....£19.99
MVT-9000 MkII.....Our price £325.00
MVT-7300EUOur price £199.95

OUR PRICE
£199.95
Delivery £10.00



ICOM IC-R5

New pocket hand-held scanner (0.1-1310MHz) AM/FM/WFM. Superb high-speed scanner featuring alpha tag and much more.

BATTERIES AND CHARGER INCLUDED

"Icom quality at a very affordable price"

Optional soft case.....£17.99
Optional cigar lead.....£19.99
Scanner + TV screen.....£299.99

OUR PRICE
£149.99
Delivery £10.00



ALINCO DJ-X3

Micro-handy scanner. 100kHz-1300MHz. 700 memories/stereo FM (earphones)/attenuator/bug detector/audio descrambler. AM/FM/WFM/ Selectable tuning steps (incl's 8.33kHz).

You couldn't fit much more into this compact scanner if you tried

OUR PRICE
£99.95
Delivery £10.00

Optional battery pack and drop in charger £39.99

Soft case.....£15.99
PC interface.....£42.95

MHz	UTC	Service	Country	Lang	SINPO	SWL	MHz	UTC	Service	Country	Lang	SINPO	SWL	MHz	UTC	Service	Country	Lang	SINPO	SWL
15.160	1635	Radio France Int	F	Eng	33333	PP	17.505	1330	Radio Sweden Int	S	Eng	34422	SH	21.455	1050	BBC World Service	G	Ara?	34333	TW
15.190	1230	BBC World Service	G/ATG		44444	DH	17.505	1336	Radio Sweden Int	S		44222	EM	21.455	1300	HCB (i.s.b.)	EOA		22222	TW
15.195	1339	Voice of Turkey	TUR		45344	EM	17.510	1033	All India Radio	IND		34333	TW	21.455	1315	HCB (i.s.b.)	EOA	Eng	55444	BC
15.195	1415	Voice of Turkey	TUR	Eng	54544	SE	17.510	1035	All India Radio	IND		34333	TW	21.455	1719	WYFR	USA		45243	EM
15.195	2020	WYFR	USA		24322	TW	17.515	1030	Vatican Radio	CVA		44444	TW	21.465	1100	Radio Pakistan	PAK		45333	EM
15.205	1532	Voice of America	USA	Eng	44444	PP	17.515	1040	Vatican Radio	CVA		44444	TW	21.465	0815	Radio Pakistan	PAK	Urd	45343	VP
15.205	1532	Voice of America	USA/GRC		35444	FW	17.535	1034	Kol Israel	ISR	Spe	34444	TW	21.465	0915	Radio Pakistan	PAK	Urd	45333	BC
15.210	1030	China Radio Int.	CHN	Eng	33233	PP	17.535	1030	Kol Israel	ISR	Heb	34433	TW	21.470	1331	BBC World Service	G/ASC	Eng	34333	SH
15.210	0950	China Radio Int.	CHN	Eng	44433	SE	17.535	0900	Kol Israel	ISR	Heb	44434	VP	21.470	1435	BBC World Service	G/ASC	Eng	44433	SE
15.215	0605	Channel Africa	AFS	Eng	33222	SH	17.560	1300	WHRA, Greenbush	USA		34322	DH	21.505	0817	Saudi Radio	ARS	Ara	44434	VP
15.235	1830	Vatican Radio	CVA		45444	EM	17.560	1345	WHRA, Greenbush	USA		45344	EM	21.570	1304	Radio Exterior Espana	E	Spa	25422	SH
15.240	1805	Voice of America	USA/MRC	Eng	35343	FW	17.560	1353	WHRI, SouthBend	USA	Eng	35444	MC	21.590	1526	The Overcomer Ministry	USA/D		45232	EM
15.240	1807	Voice of America	USA/MRC	Eng	45555	MC	17.560	1405	WHRI, SouthBend	USA	Eng	45555	FW	21.605	1033	UAE Radio, Dubai	UAE	Eng	54555	MC
15.265	1800	Channel Africa	AFS		44444	EM	17.565	1405	High Adventure Ministries	USA	Eng	44434	PP	21.605	1332	UAE Radio, Dubai	UAE		34233	EM
15.265	1800	Channel Africa	AFS	Eng	35544	FW	17.595	1040	Radio Japan	J/PAE	Eng	54444	SE	21.605	1305	UAE Radio, Dubai	UAE	Eng	54533	SE
15.270	0910	Voice of Armenia	ARM	Eng	54444	SH	17.595	2025	ETVNI Qabul Catholic Network	USA	Eng	25444	MC	21.605	0900	UAE Radio, Dubai	UAE	Ara	53444	VP
15.270	0915	Voice of Armenia	ARM	Eng	45455	MC	17.620	1407	Radio France Int.	F	Eng	24122	EM	21.650	1100	Deutsche Welle	D/KAZ	Eng	44444	SH
15.270	0915	Voice of Armenia	ARM	Eng	54544	SE	17.620	1412	Radio France Int.	F	Eng	33333	PP	21.660	1105	BBC World Service	G/CYP	Man	54444	FW
15.300	1920	BBC World Service	G/ASC	Eng	25321	SH	17.620	1430	Radio France Int.	F	Eng	25444	FW	21.660	1409	BBC World Service	G/CYP	Eng	44433	EM
15.300	0955	Radio France Int.	F	Fre	54445	BC	17.630	0830	Africa No 1	GAB	Fre	32232	VP	21.660	1445	BBC World Service	G/CYP	Eng	44433	BC
15.310	0600	BBC World Service	G/THA	Fre	34434	GG	17.640	1412	BBC World Service	G		45232	EM	21.680	1710	WYFR	USA/ASC		43334	SE
15.330	0815	KTWR	USA		45243	EM	17.650	1700	WHRI, SouthBend	USA	Eng	44444	SH	21.680	1718	WYFR	USA		35232	EM
15.340	0732	Radio New Zealand Int.	NZL	Eng	25432	MC	17.650	1705	WHRA, Greenbush	USA		55445	BC	21.705	0815	Saudi Radio	ARS	Ara	45343	VP
15.355	1700	Radio Japan	J	Eng	44344	CP	17.650	1755	WHRA, Greenbush	USA	Eng	45444	FW	21.745	1055	Radio Prague	TCH	Cze	44444	TW
15.355	1719	Radio Japan	J/NZL	Eng	35444	MC	17.670	1256	WHRA, Greenbush	USA	Eng	25343	EM	21.745	1400	Radio Prague	TCH		35233	EM
15.385	1319	HCB	EOA		32322	EM	17.690	0905	China Radio Int.	CHN	Eng	44333	SE	21.760	1233	Radio France Int.	F/AFS	Fre	35433	SH
15.395	1333	UAE Radio, Dubai	UAE		34323	EM	17.745	1325	Radio Romania Int.	ROU	Eng	55544	MC	21.770	0830	Swiss Radio Int.	SUI		32232	EM
15.395	0630	UAE Radio, Dubai	UAE	Ara	43333	VP	17.745	1330	Radio Romania Int.	ROU		45343	EM	21.770	0630	Swiss Radio Int.	SUI	Eng	34333	GG
15.400	2101	BBC World Service	G/ASC	Eng	35322	SH	17.770	1520	Channel Africa	AFS	Eng	24122	EM	21.770	0835	Swiss Radio Int.	SUI	Eng	44333	SE
15.400	0800	BBC World Service	G/ASC	Eng	44434	VP	17.770	1530	Channel Africa	AFS	Eng	44333	SE	21.790	0815	Voice of Russia	RUS		22111	TW
15.400	0825	BBC World Service	G/ASC	Eng	44433	SE	17.770	1544	Channel Africa	AFS	Eng	25443	MC	21.790	0835	Voice of Russia	RUS	Eng	44444	SE
15.415	0810	Radio Australia	AUS	Eng	44333	SE	17.780	0607	Channel Africa	AFS	Eng	24112	EM	21.790	0855	Voice of Russia	RUS	Eng	44434	BC
15.415	0845	Radio Australia	AUS	Eng	22122	VP	17.800	2009	Voice of Nigeria	NIG	Eng	25443	MC	21.800	1105	YLE Radio	FNL	Fin	22222	TW
15.415	0823	Radio Australia	AUS	Eng	34322	EM	17.810	1135	All India Radio	IND	Hin	25544	FW	21.800	1250	YLE Radio	FNL	Fin	44444	TP
15.420	1720	BBC World Service	G/AFS	Eng	43334	BC	17.810	1928	Radio Nederland	HOL/ATN	Eng	25432	MC	21.820	1035	Radio Japan	J	ha	44344	PP
15.425	1420	Voice of America	USA/PHL		54445	BC	17.810	1940	Radio Nederland	HOL/ATN	Eng	35233	EM	21.820	1040	Radio Japan	J	ha	34333	TW
15.485	1411	BBC World Service	G		44243	EM	17.815	1201	Radio France Int.	F		44243	EM	21.830	1103	RDP Int.	POR	Por	22222	TW
15.485	1616	KSDA	USA/GUM		24222	EM	17.820	1300	Radio Canada Int.	CAN	Eng	24122	EM	21.830	1135	RDP Int.	POR	Por	35533	SH
15.520	1205	Radio Ukraine Int	UKR		44343	EM	17.820	1425	Radio Canada Int.	CAN	Eng	54444	BC	21.840	1017	Deutsche Welle	D	Ger	44433	TW
15.520	1205	Radio Ukraine Int	UKR	Eng	55544	SE	17.820	1530	Radio Canada Int.	CAN	Eng	54545	PP	21.840	1140	Deutsche Welle	D	Ger	24522	SH
15.520	1205	Radio Ukraine Int	UKR	Eng	45434	GeG	17.820	1535	Radio Canada Int.	CAN	Eng	35433	MC	21.850	1030	Vatican Radio	CVA		44333	TW
15.530	1100	Radio New Zealand Int.	NZL	Eng	33222	CP	17.830	1413	BBC World Service	G/ASC	Eng	45232	EM	21.850	1141	Vatican Radio	CVA	Eng	45444	SH
15.530	1100	Radio New Zealand Int.	NZL		33222	TW	17.830	0800	BBC World Service	G/ASC	Eng	54444	SH	25.820	1200	Radio France Int.	F		25211	EM
15.530	1125	Radio New Zealand Int.	NZL	Eng	25443	MC	17.830	0830	BBC World Service	G/ASC	Eng	54444	SH	25.820	1200	Radio France Int.	F	Eng	34443	SH
15.530	1203	Radio New Zealand Int.	NZL		45243	EM	17.835	1012	Radio Pakistan	PAK		45243	EM	25.820	1206	Radio France Int.	F	Eng	35622	SH
15.530	1240	Radio New Zealand Int.	NZL	Eng	43333	SE	17.835	0815	Radio Pakistan	PAK	Urd	33233	VP	25.820	1215	Radio France Int.	F	Eng	25343	FW
15.565	1908	WYFR	USA		15443	MC	17.840	1820	WEWV, Birmingham	USA		55444	BC	25.820	1220	Radio France Int.	F	Eng	45434	BC
15.565	0815	BBC World Service	G	Eng	34423	VP	17.840	1945	WEWV, Birmingham	USA	Eng	55445	PP	25.820	1245	Radio France Int.	F	Fre	34433	9
15.580	2046	Voice of America	USA	Eng	25422	SH	17.850	1612	Radio France Int.	F		25222	EM							
15.585	1328	Radio Exterior Espana	E	Spa	44554	PP	17.855	1315	Radio Austria Int.	AUT	Eng	44333	CP							
15.595	1414	Radio Nederland	HOL/MDG		24211	EM	17.855	1641	Radio Austria Int.	AUT		45243	EM							
15.595	1720	Vatican Radio	CVA		55555	EM	17.865	1615	Radio Austria Int.	AUT	Eng	45444	FW							
15.605	1613	Radio France Int.	F		35243	EM	17.865	1617	Radio Austria Int.	AUT		24122	EM							
15.605	0720	Radio France Int.	F/GAB	Eng	44433	SE	17.870	1503	Radio Rhin Int.	USA/D	Eng	35443	MC							
15.630	1335	Voice of Greece	GRC	Gre	44444	PP	17.895	1620	Voice of America	USA/MRC	Eng	35544	FW							
15.630	1600	Voice of Greece	GRC	Eng	45544	FW	17.895	1835	Voice of America	USA/MRC	Eng	55445	BC							
15.630	0845	Voice of Greece	GRC	Eng	54444	VP	17.895	1915	Voice of America	USA/BOT	Eng	35523	SH							
15.640	1110	Kol Israel	ISR	Eng	34344	GG	18.960	1329	Radio Sweden Int	S	Eng	25422	SH							
15.650	1335	Voice of Greece	GRC	Eng	55445	PP	18.960	1330	Radio Sweden Int	S	Eng	44444	SH							
15.700	1230	Radio Bulgaria	BUL	Eng	44444	GG	18.960	1335	Radio Sweden Int	S		45232	EM							
15.700	1230	Radio Bulgaria	BUL	Eng	55445	PP	18.960	1340	Radio Sweden Int	S	Eng	43333	SE							
15.700	1240	Radio Bulgaria	BUL	Eng	44444	DH	18.960	1435	Radio Sweden Int	S	Swe	44444	TW							
15.700	1252	Radio Bulgaria	BUL		55444	EM	18.980	1717	WYFR	USA		24222	EM							
15.825	1339	WWCR	USA	Eng	34223	PP	18.980	1825	WYFR	USA		55344	BC							
15.825	1347	WWCR	USA		44233	EM														

Bandscan

America

● **Gerry Dexter** *do SWM Editorial Offices, Arrowsmith Court, Broadstone, Dorset BH18 8PW*

Lately it seems that we begin every get together in these pages with items from the debit side of the ledger. Sorry to say but that run of negatives continues this time with 'obituaries' for two more short wave broadcasters. Herald Broadcasting's WSHB at Cypress Creek, South Carolina, was closed at the end of February. The station, which at one time was part of a trio of high power outlets, was an arm of the Christian Science Church.

There is also the demise of Radio Mexico International, which left the air earlier this year without announcing any specific reason. I can confirm from monitoring that broadcasts on their 9.705 and 11.770 frequencies have stopped.

The Voice of America and Radio Free Europe/Radio Liberty have both discontinued several East European languages. Other languages have taken cuts in the number of broadcast hours and/or 'feeds'.

Worse than all of the above, however, was another large step forward in the march to adopting broadband over power lines (BPL) for Internet access. The Federal Communications Commission (FCC) has begun to write the rules and regulations governing use of this new technology, having paid little or no attention to the thousands of comments it received all expressing concern about the tremendous interference BPL will cause to h.f. reception.

The FCC appears to be taking interference problems into consideration but, frankly, we're not buying it. The FCC has taken a steamroller approach on this issue from the very beginning and we poor, unorganised listeners have no real influence, no way to halt or even slow down the inevitable. These are not happy days for American short wave enthusiasts!

New Stations

Much further to the south, a new Bolivian is Radio (TV) Unica from the town of the same name, in Norte de Potosi province, operating 4.723. Another new one from Bolivia is Radio

TV Chinchá in Tocla, Nor-Chinchá province on variable 4.763, although it announces 4.760. Two new Peruvians are Radio Cielo on variable 5.625 and Radio La Poderosa, Huancabamba on 6.536.

In Argentina, Radio Baluarte has been reactivated on its former 6.215 frequency. This operation seem to be something of a 'thin ice' affair and one gets the feeling it isn't destined to become one of South America's big gun broadcasters.

Radio Nacional, Paraguay, which had been missing from its 9.737 spot for some months, has returned with a new 100kW transmitter, courtesy of Taiwan. Oddly, despite

the new gear, they continue to be found on or very near 9.737, rather than their listed 9.735 and they continue to suffer from distorted modulation, as well. Radio Nacional is almost always well heard in North America and often features nice Paraguayan music.

Radio Melodia in Colombia has also been reactivated and is now active on its old 6.140 frequency - mostly airing relays of its sister medium wave on 730kHz. In Ecuador, La Voz del Upano has turned up on its old 4.870 frequency from which it has

been absent for quite awhile. It's announcing as 'Radiodifusora Católica Cultural Voz del Upano' and is also carrying programming of the Catholic station Radio María (which is also to be found on La Voz del Napo - 3.280).

Surinam's Radio Apinte, which showed up back on 4.991 last autumn after a very long absence, seems to have vanished again. There were a few late evening receptions over a period of several weeks, but the station doesn't seem to have been reported of late. Or, the situation may

be due to an unfortunate combination of poor conditions doing a number on their measly 1kW signal.

WMLK in Bethel, Pennsylvania, has put a 250kW transmitter into use - it should be

active by now. WMLK uses 9.465 from 0400-0900 and 1700-2200.

Radio For Peace International has surfaced again, at least in web mode. It appears that we are still quite some calendar distance away from RFPI's return to short wave after having been kicked out of their quarters at the University for Peace in Costa Rica.

Also from Costa Rica we note the welcome return of Radio Universidad (6.105) Unfortunately, that frequency is very congested making reception extremely difficult.

Another Radio Universidad, this one from San Luis Potosí, Mexico, has also resurfaced on its old 6.045 frequency. It, too, suffers from a lot of co and adjacent channel QRM.

Quite a few North American monitors have had success in tuning XERTA/Radio Transcontinental (Mexico City) but I'm not one of them. Unlike other DXers we haven't found the right time or means of getting past the Godzilla-sized noise monster on 4.810. Maybe the secret is waiting until the Mexican varies up to 4.812, as it's known to do at times. At least XERTA's current 'run' is proving to be considerably longer than its earlier frequent stops and starts.

News

Another station, which slipped away, virtually unnoticed is Radio Miskut (5.770) in Nicaragua. The word on this one is that their transmitter had been damaged but is to undergo repairs sometime in the future. We probably shouldn't look for this one to return before the end of the year.

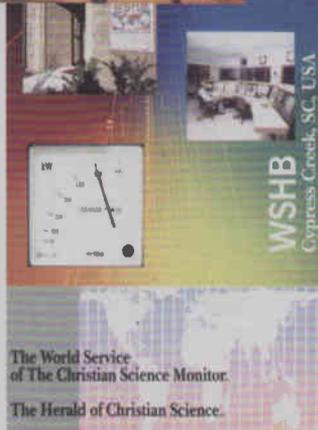
One of the most reliable 60m voices during the US evenings is Radio Buenas Nuevas, Guatemala on 4.800, as well as Radio Cultural Coatan on 4.780. Often during the 0000-0400 time period these two are the only useable signals below WWV on 5.000, which is a sort of border crossing point into the land of broadcast buffoonery spewed out by US broadcasters using the lower 5MHz range.

WJIE (formerly WJCR), Upton, Kentucky, operates the Voice of Liberty now on the air from Liberia, although only at half power (or about 5kW). The transmitter was once operated by High Adventure Ministries at their now defunct station in the demilitarised zone between Lebanon and Israel. 'Liberty' is operating on 11.515, apparently with a somewhat sporadic schedule. If you manage to log this one and want a QSL we suggest sending your report to the WJIE address (**PO Box 197309, Louisville, KY, 40259**) rather than to Liberia.

Bible Voice Broadcasting, a US-based religious broadcaster opened an English language broadcast for Iraq on 6.025 via Julich, Germany. Bible Voice is another of the now numerous broadcasters that do not own any transmitters, but simply rent time on established facilities operated by DTK in Germany, VT Merlin in the UK, etc.

That covers things for this time, I look forward to getting together again in August. Until then, good listening!

Radio Mexico International has pulled the switches on its short wave transmitters.



WSHB - the Christian Science Station in South Carolina, has left short wave, but hopes to sell the station.

Exclusive!

Icom R20

Review

Dave Roberts has another attempt to 'beat the clock' whilst looking at the brand new and remarkable Icom R20 hand-held scanner.

Have you got a stop watch? If you have, then start it - NOW! I'll explain why in just a while. "Another parcel for you, David", said James my postman as he staggered to my gate under the weight of the mail. (He's quite formal and always calls me David). "Sorry I'm late. The van broke down. Sign here".

It was 1845 and I'd been watching the gate for his arrival for hours. I mean it's not every day you get a five hundred 'quid' Icom scanner delivered for you to play with.

Some hand-held scanning radios feel somehow **insubstantial**. Nothing that Icom has ever made gives that impression and the new Icom IC-R20 is no exception. It's a real handful but by no means too large in the fist. It's good of Icom to supply an R20 for me to have a 'peek' at and I was determined to make the most of it. The set came supplied with a moulded plug top charger/a.c. adapter, belt clip and a telescopic antenna. The handbook was in draft format and without it the R20 may have taken an hour or two to master. Checking the manual revealed that the set is fitted with a removable battery pack containing Lithium-ion rechargeable batteries. Li-ion cells are ideal for this application and it was good to see that they were easily removed to allow replacement if required and also to facilitate the use of normal AA cells should the need arise. Access to the battery compartment is via an easily opened battery 'gate' at the base of the set.

LF to Microwave

Looking at the very top of the R20 it was a relief to find a BNC socket mounted on the roof instead of the SMA type with which so many radios are inflicted these days. This enables various antenna options to be easily utilised, and you'll need 'em because this receiver covers from 150kHz



to over 3.3GHz. That's right - from long wave to microwave!

If like me the first thing that you do on receipt of a new 'toy' is to turn it on and try and get some sense out of it without even sullyng the virgin pages of the handbook, then you won't get far with the R20. I didn't. A previous user had partially programmed the receiver and had also altered the function of some of the 'soft' key controls.

I was lost! Looking at the handbook I discovered how to completely reset the unit and having done so I again consulted the manual and within a few minutes I'd grasped the logic behind the operation of the thing and in no time configured the radio to suit myself. Although it's not a scanner for those of us who suffer docuphobia, once I overcame my reluctance to read the manual I never looked back...easy...easy.

Firstly, I'll cover a few basic features of this little radio. When operating on frequencies from 150kHz to 470MHz the R20 can be switched to cover the following modes; c.w., l.s.b., u.s.b., a.m., n.b.f.m. and w.b.f.m. At frequencies above 470MHz the modes are restricted to a.m., n.b.f.m. and w.b.f.m. only.

There is a liquid crystal display on the front of the unit and this presents clear and sharp information to the user. Basic operation allows the receiver to be used as a single v.f.o. radio or as a twin-bander with two frequency bands or memory channels being displayed. There are a total of 1050 memories available including search band limits. When set to operate as a single band set the R20 provides coverage of the entire range on one band. If you choose to set it up as a 'dual watch' radio, thereby displaying a 'main' and a 'sub' band simultaneously the 'A' band (the upper one on the display) will only cover from 150kHz to 470MHz (all modes) and the 'B' band will only tune frequencies above 118MHz. The 'B' band will only operate in a.m., n.b.f.m. and w.b.f.m. modes.

As for the other features - well it's packed! Where do I

start? Oh yes, there are nine squelch levels or the squelch can be turned off. The setting that I preferred for normal scanning is the 'Auto' level. The R20 takes care of your squelch threshold using a noise pulse count system, whatever that is. It works well anyway. You can drop the squelch temporarily by simply pushing and holding the top button on the left hand side of the radio.

Should you require to monitor the input of a repeater or the other half of a two frequency simplex system then this is catered for with the R20. You enter the frequency split in the 'set' mode and then select whether the split is above or below the receive frequency that you have entered. Then, when you want to hear the other half of the contact, on the other frequency, you hold the aforementioned squelch control.

Thanks For The...

...Memories. This set has more memories than Hugh Hefner. There are one thousand normal memory locations.



The standard Li-ion battery.



Nice belt clip. However, note the serial number!

Exclusive!

Icom R20 Review

Add to that two hundred memories that can be utilised to automatically store frequencies heard during a search under the 'Auto-memory write' feature. Yes there's more! You can programme specific searches into the R20 using the fifty 'band edge' memories. Management of all these stored frequencies is a simple matter. The radio allows memories to be transferred to other memory locations and alpha-numeric tagging is also supported. There are 26 banks available in which to keep the stored frequencies. Frequency steps from 10Hz to 100kHz are programmable including 8.33kHz for airband and 9kHz is available for the medium wave broadcast band.

Entering known frequencies into the memory channels is really very simple. After having peeked at the instruction

book I ended up programming the channels at the rate of one a second. Programming is via a direct entry numerical keypad. I reckon you could certainly be holding a conversation while filling up the memories. It's that easy. Some people can't see the point of having a keypad beep function with tones to indicate the completion of tasks such as channel programming but this is the case where this facility comes into its own. Trust me - the beeper makes the task much swifter.

I tried to time the scan speed and from what I could figure the Icom is no slouch at around 23 channels per second, a respectable speed. The radio has numerous options with regard to scanning and priority channels.

Just in case you want to see the signals as well as hear them, you've got it...there's a band scope facility too!

More Features

Now to tones. The R20 has the capability to decode CTCSS tones this allows it to determine which particular tone is being used on a specific channel. Also if the CTCSS frequency is known then this can be entered into the relevant channel memory. This prevents the audio stage firing up when the channel is in use by a user with a tone other than that programmed. The same goes for the Digital Tone Coded Squelch (DCTS) facility with normal and reverse polarity settings being available thereby doubling the available settings to 1008.

There's also a Voice Squelch Control that stops the squelch opening when blank carrier or data type signals are received and (in theory) only opens it up when voice is detected.

All the above features together with the r.f. gain and attenuator, power saving circuit, a noise blanker and an automatic noise limiter add up to one pretty awesome package. There's also a bar antenna built-in for medium wave reception.

OK, now that has given you a basic idea of the features on the R20, so how does it perform on air? Looking at the sensitivity figures published in the draft manual it appears that they measure up to other radios of the same type on the market. Starting at lower amateur frequencies it follows that the telescopic antenna supplied with the set isn't going to be too hot, so I plugged in my h.f. station dipole and the R20 came alive. Reception was clear and the sensitivity, from a users point of view sounded fine. The audio was a little sharp (i.e. tinny) for my taste on s.s.b. operation, but that's merely a personal view and what can you expect for such a small speaker?

I did notice that at some h.f. frequencies the display indicated around 1.4kHz high of the frequency actually being received. This is no big deal on a set of this type, and by no means unusual, but it's certainly worth mentioning.

As we move up through the frequency bands the Icom R20 performs very capably indeed. Of course broadcast bands are included and with the wide f.m. option the recovered audio is of good quality with 100mW being quoted as the maximum output to the speaker. Listening to Radio 4 on this set does, however, make sledgehammers and nuts spring to mind.

Through u.h.f. the set does just what it ought to and does it very well indeed. The sensitivity figures on the microwave bands would indicate that specialist antennas would be required, either that or close proximity to the transmission source. Not having a microwave source nearby I was unable to give the R20 an effective work out on bands above 1GHz.

All-in-all this is a very good scanner. As it's made by Icom, I'd be very surprised if it wasn't. They have a top





notch reputation when it comes to communications gear and the R20 is a credit to them.

One Big Thing!

But there's one more thing. One big thing that in my opinion transforms this radio from a competent, capable receiver to a spectacular one.

There's a row of four buttons at the bottom of the keypad. They look just like controls for a tape recorder. Well that's pretty much what they are, but without the tape. Have you ever been monitoring on your receiver, heard something and thought, "Boy I wish I could have recorded that" Well now you can. Just hit the bottom right hand button marked 'REC' a little red light comes on and, yes, it's recording the audio. When you're ready to stop tap the one to the left of it and there's the audio recorded for posterity and labelled 'track 1'. Further recording events follow on numerically up to a total of 32 such tracks.

One touch recording on a scanner! Now that's very good.

Don't pause for breath here - there's more to come. You

can set up the receiver to record every time the squelch opens. The recording level is set automatically. This means that the radio can be set to scan a set of frequencies (or just left idling on one) and you can turn the speaker volume right down and go to bed. I did!

In the morning having showered and all the other things that blokes do, I wandered ~~up to~~ the R20 that I'd left connected to an outside antenna. I found that the sweet little thing had recorded plenty of action for me to play back while I fought with my computer. Now this isn't just neat - it's marvellous!

Now Stop That Stopwatch!

If you've been reading this at a fairly slow conversational speed it will have taken you around seven minutes. That's a whole lot of information, isn't it, and the R20 has more than enough capacity to store that much audio.

The Icom R20 has three record quality levels. Not surprisingly they are called 'Long Time', 'Normal' and 'Fine'. Well, I've tried 'Long Time' and 'Normal' and they both sound just fine to me. There is a very slight difference between the two but it's not anything that you'd really notice. The 'Fine' setting certainly provides the highest quality audio but the difference between the other two is not worth noting.

On the 'Fine' setting the set will store 65 minutes of audio, on 'Normal' 130 minutes are stored and wait for it...265 minutes of audio can be recorded on the 'Long Time' setting. That's four hours 25 minutes of good audio in a small radio.

This is not an April Fool. It works, I've used it!

You can play back the recorded audio at five different speeds too!

There will soon be software available to download the recordings and control the rig unfortunately it's not ready yet, but in any case you'll still be playing with the buttons when they bring it out.

I've run out of space. I can't go on about the 'soft' keys or the high tone filter.

I can think of many people who will feel that they need this radio to enhance their lives. It probably will. It's a really good set.

I've got to lie down!

Special thanks to John Turner of Icom UK who helped me when I had finger trouble.

The Icom R20 is available from all good radio stores, with a suggested retail price of £499.99. For more information contact Icom UK Ltd., Tel: (01227) 741741 or web: www.icomuk.co.uk

If this has you tempted - next month we're offering an R20 as a prize thanks to Icom (UK) Ltd.

External connections, including CI-V computer interface.



Satisfy Your Lust For Thrust At RIAT 2004!

Experience all the thrills and excitement of The Royal International Air Tattoo this summer as the 'roar' power of some of the world's most awesome flying machines are unleashed into the skies above RAF Fairford in Gloucestershire. From the heart-stopping precision flying of the Red Arrows to the jaw-dropping aerial displays by many of the world's leading 'Top Gun' pilots, Europe's largest Airshow is guaranteed to satisfy everyone's lust for thrust. On the ground there's even more family entertainment with a concert, hot air balloons, stalls, exhibits, roadshows and exciting virtual reality rides.

Airshow Traffic Improved

On the advice of a team of professional traffic management consultants, a new traffic plan was designed to improve vehicle flows to and from RIAT 2003. In addition to this, the entrances to car parks were widened and resurfaced. These, and similar, initiatives won widespread praise for having a huge impact on traffic flow and organisers are confident they will prove just as effective in 2004.

D-Day

RIAT 2004 will mark the 60th anniversary of this epic 'invasion' by recreating the sights and sounds of a D-Day airfield featuring some of the aircraft that contributed to its success, including Dakotas, Mustangs and Spitfires.

Entente Cordiale

To mark the centenary of the signing of the historic *Entente Cordiale*, Tattoo organisers are promising a unique aerial display that will surpass last year's stunning joint flypast by the Red Arrows and a USAF F-117A stealth bomber. In addition this year, there will be a feast of Anglo-French entertainment - in the air and on the ground - to highlight the ties that unite our two countries.

Happy Birthday Herk

Few aircraft during the past 50 years have done more to directly relieve the suffering of starving people around the world than the Lockheed Martin C-130 Hercules. From Ethiopia and Rwanda to Kosovo and Somalia, the Hercules has brought relief to many thousands of hungry people in some of the most inhospitable areas of the globe. But, far from simply being an international instrument of humanitarian goodwill, the 'Herk' has been used on a greater variety of missions than almost any other type of aircraft. To mark the 50th anniversary of this multi-talented 'workhorse', RIAT 2004 will spotlight the aircraft's versatility in search and rescue, famine relief, in-flight refuelling, firefighting, Arctic operations support, paratroop delivery and military support roles around the world.

The Hawk

The BAE SYSTEMS' Hawk is among the most successful modern, two-seat advance jet trainer produced in the world and, after 30 years in production, it remains the aircraft of choice for many air arms. To mark this milestone, RIAT 2004 will highlight the appeal of this versatile jet by bringing together operators of this advanced trainer and light attack aircraft. Such is its speed and manoeuvrability, it has been the Red Arrows' aircraft of choice since 1980. How fitting then, that as the Hawk celebrates its birthday, the world-famous 'Reds' will be at The Royal International Air Tattoo to celebrate another landmark - their 40th display season.

Fighter 04

This year's operational theme 'Fighter 04' will see one of the largest collections of fighter aircraft from around the world including the Hunter, F-15, F-16, Tornado, Sea Harrier, the Mirage 2000 and Typhoon, in an unforgettable display of their air defence and air superiority capabilities.

The Great Escape

Joining the Tattoo to mark the 60th anniversary of The Great Escape will be the last two surviving UK-based veterans of The Great Escape. They will join the special tribute to those who took part in one of most daring - and infamous - episodes of World War Two history.

Shuttle Bus

Frequent shuttle bus service from Swindon Bus Station to RIAT, taking around 40 minutes on the express route. First bus leaves Swindon at 0730, last bus returns from RAF Fairford around 2015.

Free Rides

Once inside RAF Fairford, a regular shuttle bus service will operate free of charge within the show ground throughout the day.

This year's Royal International Air Tattoo will be held at Fairford in Gloucestershire between July 17 & 18 2004. Here's your chance to win one of the 10 pairs of tickets kindly donated by the organisers.

RIAT 2004

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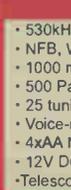
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- 4xAA Ni-Cds
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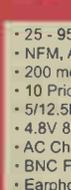
UNIDEN-BEARCAT UBC-3000XLT



- 25 - 1300MHz with gaps
- NFM, WFM, AM (Airband)
- 400 memories
- 10 Priority channels
- Twin Turbo Scan & Search
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- Leatherette case
- Earphone

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- NFM, AM (Airband)
- 200 memories
- 10 Priority channels
- 5/12.5kHz channel steps
- 4.8V 800mAh Ni-Cd power pack
- AC Charger
- BNC Flexible Antenna
- Earphone

£159 B



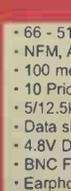
UNIDEN-BEARCAT UBC-220XLT



- 66 - 956MHz with gaps
- NFM, AM (Airband)
- 200 memories
- 10 band coverage
- 100 Ch/sec scan speed
- Priority channel
- 4.8V 600mAh Ni-Cd int. battery
- AC Charger
- BNC Flexible Antenna

£119 B

UNIDEN-BEARCAT UBC-120XLT



- 66 - 512MHz with gaps
- NFM, AM (Airband)
- 100 memories
- 10 Priority channels
- 5/12.5kHz channel steps
- Data skip (lockout channels)
- 4.8V DC int. battery
- BNC Flexible Antenna
- Earphone

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- *100kHz - 30MHz
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- 4x AA cells (not provided)
- BNC Flexible Antenna
- Earphone

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UNIDEN-BEARCAT UBC-780XLT



- 25-1300MHz with gaps
- NFM, WFM, AM
- 500 memories
- Analogue Trunk Tracking
- Alphanumeric display
- Automatic Tape recorder option
- Antenna BNC
- 13.8V DC 700mA

£299 C

AOR AR5000A/AR5000A+ NEW

The new AR5000A now offers a frequency coverage of the entire radio spectrum that is practical to cover. The +3 version offers even more with synchronous AM (USB/LSB/DSB) AFC & Noise Blanker. *10kHz-3GHz *AM, FM, USB, LSB, CW *2000 memories *45 CH p/s scan speed *Audio 1.7W (8 Ohms) *Supply: 12V DC @ 1A *217x100x260mm *3.5kg



AR5000A £1599 C

AR5000A+ £1799 C

YAESU VR-5000 "DESKTOP RECEIVER"



- 100kHz - 2599MHz
- FM, AM, SSB, CW
- 2000 memories
- Large digital display
- Real-time band scope
- DSP Noise & notch filters (Opt)
- Super HF performance
- Automatic Tape recorder option

£449 C

YAESU VR-500

- 100kHz-1300MHz
- NFM, WFM, AM, USB, LSB, CW
- 1000 Memories
- 100 Skip channels
- Smart search feature
- 8 char. alphanumeric display
- Band scope
- PC programmable



£199 B

YAESU VR-120D



- 100kHz-1300MHz
- AM, FM, WFM
- Adjustable steps
- Over 600 memories
- Skip channels
- Smart search
- Alphanumeric tags
- Requires 2xAA cells

£119 B

OPTOELECTRONICS SCOUT



The Scout frequency recorder automatically stores frequencies as it locks onto them *10MHz-1.4GHz *Input: 50 Ohm *Sens: <3mV @ 150MHz *Measurement: 10mS *Records: 400 freqs *Display: LCD *Bargraph: 16 segments *Supply: Int Ni-Cads *Battery life: 8hrs *AC adaptor AC90 *Size: 94x70x30.5mm *Weight: 240g

£299.95 B

OPTOELECTRONICS X-SWEEPER NEW

Top-of-the range product from Optoelectronics, a fully featured nearfield receiver that displays nearfield analogue signals in spectrum format. *30MHz-3GHz *FM Analogue *64x128 graphical display with white LED backlight *20 memory banks, 100 freqs in each *Sens: 100uV @ 500MHz *Pwr: 8xAA alkaline or AC adaptor (optional) 12V DC 350mA *Size: 203x108x22.5mm



£1399.95 C

X-SWEEPER with GPS: £1599.95

ICOM IC-R5



- 150kHz-1310MHz
- AM, FM, WFM
- 1250 Memories
- Name Tagging
- AM Ferrite antenna
- Civil & Military
- Emergency Services
- 2xAA cells (extra)

£159 B

ICOM IC-R3 SCANNER & TELEVISION

- 495kHz - 2450MHz
- AM, FM, WFM, AM-TV, FM-TV
- TV mode PAL (UK)
- 450 memories
- 50.8mm (2in) TFT colour display
- Simple bandscope
- BP-206 Lithium-ion battery
- Telescopic Antenna



£339.95 B

20-004I PREAMPLIFIER SPECIAL OFFER



RADIO SHACK HANDHELD SCANNER AMPLIFIER
 Specifically designed for handheld scanning receivers using BNC antenna connectors (male/female) for ease of connection. *100-1000MHz *Gain variable 0-20dB *Bypass switch *Requires PP3 batt or ext. 9V DC 100mA min. *In/Out BNC connectors *Size: 40x95x35mm *Weight: 100g
SPECIAL OFFER WAS: £69.95

£29.95 C

ICOM IC-R8500 "THE EDITOR" GOT ONE!

- 100kHz - 2000MHz
- USB, LSB, CW, AM, FM, WFM
- 1000 Memories
- 3x Antenna Connectors
- Audio 2.5W (8 Ohms)
- Supply 13.8V DC
- Free PSU included
- Weight 7kg



£1149 C

ICOM IC-PCR1000IS



- 100kHz - 1300MHz
- USB, LSB, CW, AM, FM, WFM
- Unlimited memories
- Synchronous AM detection
- RS-232 interface D-sub 9-pin
- BNC Antenna connector
- New Icom version 2 software
- Requires PC (Not included)

£309 B

WINRADIO G303i-PD



HF PC RECEIVER
 9 kHz to 30 MHz
 *Tuning resolution: 1Hz
 *Modes: AM, AMN, AMS, CW, FM3, FM6, FMN, (USB & DSB, Pro Demodulator Option only) *Antenna: 50ohm (SMA) *Dynamic Range: 95dB *IP3: +8dBm

£528 C

bhi NEIMI031



NOISE ELIMINATING IN-LINE MODULE

* Noise attn 9-35dB * Noise Attn levels 8 * Audio output power 2.5W RMS max (8 Ohms) * Audio connections: Line level in/out (RCA Phono), Audio in/out 3.5mm mono jack * Line in impedance 10K * Line out impedance 100 Ohms * Line in sensitivity 300mV -2V RMS * Headphone socket 3.5mm mono jack * Power 12-24V DC 500mA

£129.95 B

bhi NES10-2 & NES-5



NES10-2

*Speaker with built-in DSP noise filters *Dip switches for 8 filter settings (NES10-2) *DSP settings preset, no user adjustment (NES-5) *Plugs directly into 3.5mm speaker socket *Handles up to 5 Watts input *Max 2.5 Watts output *Requires 12V at 0.4 Amps max *Use mobile with cigar adaptor

£99.95 B



NES-5

£79.95 B

SGC ADSP-2-EXT SPEAKER



The ADSP: Speaker has three modes of operation - no noise reduction - original ADSP noise reduction - or the new ADSP noise reduction mode which provides up to 26dB of noise reduction within the passband.

£93 B

ROBERTS R9914



- 153kHz-30MHz, 87.5-108MHz
- AM, SSB/CW, FM (Stereo)
- 45 Station preset memories
- Stereo through earphones
- Dual time
- Clock/Alarm
- 4 x AA cells (Alkaline)
- 230V AC adaptor

£99.95 B

MFJ-784B DSP FILTER



£249.95 B

The MFJ-784B Tunable DSP filter automatically eliminates all heterodynes, random noise, white noise, impulse noise, static, ignition noise, power line interference, atmospheric noise etc. There are 16 factory pre-set filters to match all the popular modes which can be re-programmed by the user and saved.

OREGON SCIENTIFIC BAA 898 HG



The BAA898HG Wireless Weather Station offers more info than ever! Weather, temperature, pressure trends as well as pressure readings, history and max and min readings. Operates with up to 3 remote thermo-hydro sensors, one supplied. *Wireless freq. 433MHz *Main unit 195x105x77mm, 4xAA cells *Remote unit 92x60x20mm, 2xAA cells. Optional Thermo-Hydro Sensor: THGR228N

£79.95 B

WS-2300 WEATHER STATION



This professional wireless weather station is a high quality system that measures the indoor surrounding area and receives weather data from 3 outdoor sensors through 433MHz signal. *Base receiver station *3 Outdoor sensors- Thermo-hydro transmitter, Wind sensor, Rain Sensor *PC program on CD-ROM *RS-232 serial data transfer *AC/DC power adaptor

£199.95 C

GARMIN GPS-III+



Compact handheld GPS with cartographic capabilities. Offers flip-flop display, vertical for handheld or horizontal for installation in vehicle. Many optional accessories available. Includes Atlantic International database & basemap with up to 1.44MB downloadable from optional Roads & Recreation MapSource CD-ROM.

£299.95 B

WATSON FC-130 "MICRO COUNTER"



- Off-air Frequency Counter
- 10MHz - 3GHz range
- 4 Switched Gate Spreads
- Hold Display Button
- 2 Switched ranges
- Internal ni-cad battery
- Whip Antenna
- AC Charger

£59.95 B

WDP-30 Short Wave Dipole



8.5m long!

£49.95 B

This new design from Watson gives you dipole performance across the entire short-wave bands. Unlike random wires, it reduces the background noise and pulls in the signals. And its small size means it will fit most gardens. Absolutely no adjustment required. 10m coax feeder included

WATSON HP-200 & HP-100



HP-200

HP-100

Superb headphones with tailored response for radio comms. Excellent sound proofing, can pull in the weak DX.
 * Mono 8 Ohm 200-10,000Hz
 * Padded ear pieces
 * 3.5mm stereo plug
 * 1/4" stereo adaptor

£22.95 B

Excellent lightweight comm headphones with tailored response for the modern transceiver or receiver.
 * 8 Ohms 200-9,000Hz
 * Adjustable headband
 * 3.5mm stereo plug
 * 1/4" stereo adaptor

£19.95 B

Remote Radio For All

Kevin Nice shares a well kept secret that allows you to monitor your favourite chunk of spectrum at those times when you're away from your shack. The DX Tuners network currently offers almost 50 receivers world-wide.

Listen to the world, this is surely the goal of most SWM readers. It probably conjures up a stereotypical image for most readers of how this occurs. Now there's a new way to listen to your favourite frequencies. In this feature I'll explain how you can do just that, but with a slight difference. I'm going to show you how to keep an ear on the airwaves using fellow enthusiasts' radios as well as or instead of your own set(s).

Out there in Internet land - please don't stop reading because I mentioned the 'I' word - there is an expanding network of shared receivers run by Swedish radio enthusiast and founder of both the network and the concept, Kelly Lindman. Kelly is seriously enthusiastic about radio and he personally runs five DX-Nodes on the DX-Tuners network.

them to take things further.

The system works very well and offers a user in, for instance the UK, the ability to listen to and tune receivers from around the globe.

All that is required to enjoy the use of any of the radios on offer is an Internet connection and a computer capable of running a reasonably modern web browser, a Macromedia *Flash Player* plug-in and importantly, assuming you want to hear the audio, a sound card set-up.

If you wish to take a wander around the DX-Tuners site then you need to visit www.dxtuners.com After a brief glimpse of a redirect page you will be greeted by the welcome screen, Fig. 1. Along with system news and links to other levels, the top right of the page presents a login window and a way in for new users. To join the DX-Tuners requires you to complete the form seen in Fig. 2. Once you've filled out the details your application is processed and you are notified of your password via the E-mail address that you specify in the questionnaire.

Having received the confirmation from DX-Tuners you are then able to log-on to the network and explore the capabilities provided. Every time you sign-in you are presented with the reminder about courtesy and etiquette to other users. It is very unlikely that you'll be the only users logged in to any specific receiver at any time. Since every user has the ability to control the receiver parameters there is scope for devilment and, or frustration. I personally have not encountered any problematic situations but there's scope. Luckily, this potential has been considered and DX-Tuners have provided a 'chat' window, as well as the window listing users with active connections to the receiver. The chat window allows any of these connected users to communicate with each other. (Normally about the signals being heard or frequencies to retune to). Well thought out I reckon!

When you've chosen a receiver to use, the next screen looks like Fig. 4, whilst the 'Flash' software loads. On completion the radio is ready to use and you'll be looking at something like Fig. 5. This typical screen shows the virtual controls and display for one of the mainstay receivers used on the DX-Tuners system, the Icom PCR100. The other and more prevalent receiver is the PCR1000. As the PCR1000 provides more functionality, with the addition of s.s.b. capability, there are additional buttons plus a tuning knob provided on its virtual front panel.

If you study Fig. 5, you can see all the receiver owner's dialogue box directly under the 'S' meter and display. This is where owners' name, location, antenna, radio type and other important information is displayed. Below this is a window used to provide both system and user status updates and user dialogue. The empty line below this is where you the user, types any comments or questions for those sharing the virtual receiver. Any comments sent are then displayed in the main status window. To the right of this is another window that shows a list of connected users.

Using the radio is simple. If you've used any computer controlled receiver before, you'll be right at home. Even if you haven't then you'll still be comfortable in no time. Operating couldn't be much easier - type in the frequency, hit the enter key on your keyboard (or drag the

What's It Called

Now called DX-Tuners, the network that provides some 47 receivers world-wide started life under the name Javaradio, which is a name that may be familiar to some of you. The new network name was inspired by the familiar term DX which I'm sure you all know is a term used by radio enthusiasts, it stands for the long-distance reception of radio signals, DX being a short-form way of saying 'distance extreme'. DX has two meanings for dxtuners.com and its members, firstly, you can tune receivers extremely far away, and secondly these receivers can all hear radio transmissions even further away.

The original Javaradio name was derived from the use of Sun Microsystems *Java* language to control the operation and interconnection of the radios world-wide.

The DX-Tuners concept is simple. If you are a generous spirited type and you've a suitable spare radio, a PC running *Linux* and a permanent Internet connection then you can volunteer your hardware for connection to DX-Tuners. There are even plans afoot to pay those providing full-time nodes which allow use of their radio by fellow users of the DX-Tuners network.

To enable others to use your equipment via the network, server software is installed remotely by using the Internet. This server software provides the control system and interface to your receiver, an MP3 audio stream server to send the received audio out to the remote user or users, as the system supports multiple users, and the server that provides the visual feedback or virtual receiver front panel to those connected to the node. Once the installation is completed by DX-Tuners staff, then your radio is available to registered subscribers to the system. Those people who've signed up for an investigative peruse of the DX-Tuners network's capabilities only get access to the various demo sites to allow them to assess whether the system is of sufficient interest for

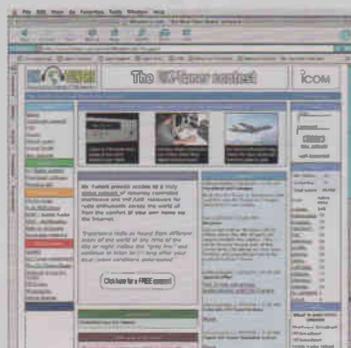


Fig. 1: The DX-Tuners main page.

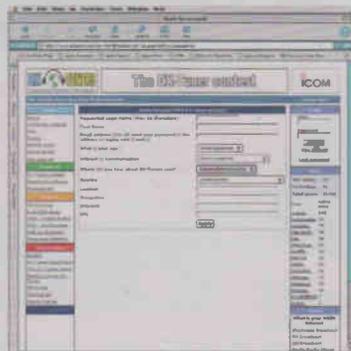


Fig. 2: The new user sign-up page.

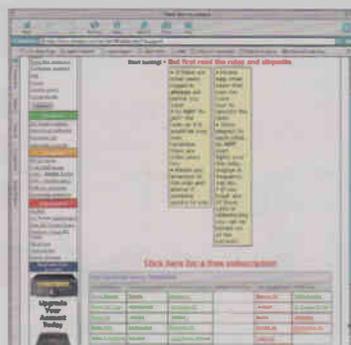


Fig. 3: The reminder that you are not alone.

tuning knob with your mouse) click on the mode you require, select an filter bandwidth and wait a short while and the audio will appear via your speaker(s). Simple. Don't be caught out when you chose a channel that isn't very active on v.h.f./u.h.f. as, depending on the squelch setting, you may hear nothing for some time!

I have had success with *Windows*, *Linux* and *MacOS* machines, so the DX-Tuners is certainly platform independent. I know that this concept is not going to appeal to everyone. I'm aware that there is quite a proportion of *SWM* readers who want nothing to do with the Internet, but for those of you who are connected I suggest that you take a serious look at this service. It allows me to keep an ear on the airways while I work here at the *SWM* offices, which are located in a very poor area for radio. Prior to using DX-Tuners I was unable to listen from my desk.

Assuming you have happy experiences with DX-Tuners, the day will come when you want to upgrade your account and subscribe. I personally believe that for what's on offer with DX-Tuners, the subscription is very reasonable - but I'm sure that there are those who'll disagree. Quite obviously anyone without a fast Internet connection will probably fall in that camp. If you wish to subscribe then Fig 6. is where you'll need to go. As you can see, not unreasonable sums of money to effectively borrow someone else's radio for a year!

Who Runs It?

It is Kelly Lindman's company Lindman IT AB, Sweden, that runs the network together with a bunch of enthusiasts around the world.

Currently they are;

Kelly - SM7NHC, KB7CTX Founder, designer, programmer, web programmer, network manager. Owner and director of the company Lindman IT AB, Sweden which owns and maintains the DX-Tuner code and web platform.

Andy - GM4IPK DX-Tuner network manager. Also responsible for world-wide promotion of DX-Tuners.

Kai - VK6KSJ Australia, Asia, Indian Pacific Co-ordinator. DX-Tuner network manager and system support. Co-founder of the original Javaradio network - first radio on the network back in 1997.

Johan - SM4XFJ DX-Tuner network manager, system support and web programmer.

Brad - an s.w.l. for 40 years. DX-Tuner network manager, system support, Newsletter, Short wave Listening and DX Advisor.

Geoff - VA7CWD DX-Tuner network manager, system support, active amateur radio operator.

Available Nodes at time of going to press (early April).

Location	Country	Information	Status
Broome DX	Australia	Icom PCR1000, Discone at 20m a.s.l.	Offline
Demo Canada	Canada	Icom PCR100, Discone	Online
Moosonee	Canada	Icom PCR100, Multiband quad	Online
Toronto	Canada	Icom PCR100, Discone	Online
Wernigerode	Germany	Icom PCR1000, Eurostick DX	Online
Cologne	Germany	Icom PCR100, Discone	Online
Stuttgart	Germany	Other, Discone	Offline
Kristianstad	Sweden	Icom PCR1000, AP-7000 Discone	Online
Demo Europe	Sweden	Icom PCR1000, Discone at 15m	Online
Vidablick	Sweden	Icom PCR1000, Discone at 100m a.s.l.	Online
Karlstad	Sweden	Icom PCR1000, GP 65-174MHz	Online
FMDX-Sweden	Sweden	Icom PCR100, 9x8 el Multi-Yagi array	Online
Rommele DX	Sweden	Icom R75, EWE Array	Online
Stockholm VHF	Sweden	Icom PCR100, Discone at 15m	Online
N. Europe HF-VHF	Sweden	Icom PCR1000, Discone at 20m	Online
Copenhagen Airband	Sweden	Icom PCR100, 131MHz GP	Online
Demo DX-Tuner	Sweden	Icom PCR100, Virtual Wave	Online
MW Beverage	Sweden	Icom IC-735, 400m Beverage	Online
Geneva	Switzerland	Icom PCR1000, Discone	Online
Edinburgh	UK	Icom PCR1000, Discone at 15m	Online
Manchester	UK	Icom PCR1000, Discone at 15m	Online
Folkestone	UK	Icom PCR1000, Discone at 15m	Online
Gatwick	UK	Icom PCR100, Discone at 15m	Online
London VHF	UK	Icom PCR100, Discone	Online
Stratford-on-Avon	UK	Icom PCR1000, Discone	Online
Colchester	UK	Icom IC-706 Mk2, Longwire & v.h.f.	Online
Bristol	UK	Icom PCR1000, Active Antenna	Offline
Demo UK	UK	Icom PCR1000, Discone	Online
ACARS UK	UK	Icom PCR100, 131 MHz GP	Offline
FMDX-UK	UK	Icom PCR100, 8 element Yagi	Offline
Lancaster	USA	Icom PCR1000, Discone at 15m	Offline
Columbus	USA	Icom PCR1000, Discone - long wire	Offline
Colorado	USA	Icom PCR1000, Discone at 15m	Online
Tidewater	USA	Icom PCR100, Discone at 15m	Online
Demo USA	USA	Icom PCR1000, Discone at 15m	Online
Chicago DX	USA	Icom PCR1000, Discone at 15m	Online
Tucson	USA	Icom PCR1000, Ferret 30Mc-1.5Gc	Online
Corona	USA	Icom PCR1000, Discone	Online
Laguna Hills, CA	USA	Icom PCR1000, Discone	Online
Palos hills, IL	USA	AOR AR3000A	Online
Florida 1	USA	Icom PCR1000, Discone	Online
Philadelphia	USA	IC-718, Dipole	Offline
Washington DC	USA	Icom PCR100, Discone 7m	Offline
Florida 2	USA	Icom PCR100, Discone @ 16m	Online
Maryland	USA	Icom PCR1000	Online
Demo S.America	Venezuela	Icom PCR1000, Discone/Longwire	Online
San Antonio DX	Venezuela	JRC NRD-545 DSP, Discone/Dipole	Online



Fig. 4 (above): The Flash application loading on the user's computer.

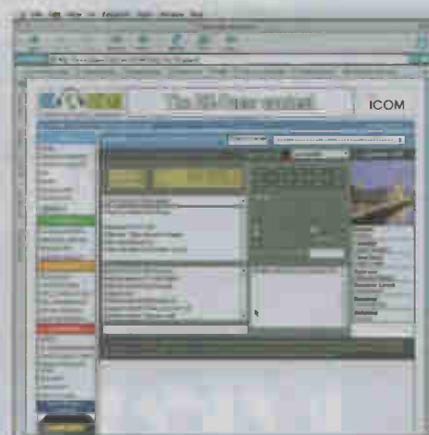


Fig. 5 (right): The working virtual receiver screen loaded and running.

continued on page 36

Happy birthday Nevada

35

Happy Birthday

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- Airband: 108-136.975MHz VHF 136-180MHz
- Selective Channel Steps: 5, 10, 12.5, 15, 25, 1MHz
- Modes: AM or FM
- Memories: 99
- Supplied c/w Belt Clip, Carrying Strap
- Mains Charger
- £8.95 £2.75 p&p

£69.95

ALYCOM AR100

New Mini Dual Civil/Military Airband Radio

- 66-174, 420-470 MHz
- AM/FM/WFM
- 150 Memory ch.
- S meter bargraph
- 3 x AA cells (not supplied)
- Supplied c/w: SMA antenna, belt clip, carrying strap

£99.95

ALYCOM AR73

Pre-Amp

- 24MHz to 2150 MHz
- Variable gain: -10dB to +20dB
- 12V DC or internal Battery
- BNC plug & socket
- Size 95 x 50 x 33mm
- Weight 180g

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ALYCOM AR71

Wideband Scanner + TV

- 495kHz - 2451MHz
- 450 memories
- FM, AM, WFM, AM-TV, FM-TV
- Supplied c/w:
 - Telescopic antenna
 - Belt clip
 - Charger
 - LIION battery pack

SPECIAL PRICE

£110.00 £110.00

PAY BY CHEQUES/PREPAY

ARESD004 + 2

- 10kHz-2.6GHz
- Modes AM, FM, USB, LSB, CW
- 1000 memories
- 45 ch/sec scan
- 20 search banks
- DTMF decoder
- RS232 port
- N type & SO239 sockets
- Audio 1.7W (8Ω)
- 12V DC @ 1A

SPECIAL PRICE

£1,799.95 £1,799.95

PAY BY CHEQUES/PREPAY

ARR AR-8100

All Mode Wideband Base Receiver

- Now 100kHz-3GHz
- Increased RX sensitivity
- New Bandpass filter
- 12V DC or optional internal NiCad pack

SAVE £20

NEW VERSION

OPTIONAL PSU AVAILABLE

£539.95 £539.95

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FAMHVEN AR500 Vx

Full featured wideband scanning & communications receiver

- Latest database (over 20,000 freq)
- 0-1750MHz (gap at 36-46MHz)
- LSB, USB, AM, CW, Synchronous AM (USB, LSB and DSB), NBFM, Wideband FM, STEREO FM, Video output
- Tuning steps Auto/user
- 54,700 definable memories
- Stereo, Record & Video outputs
- Data Slicer
- 50 memories/steps per sec
- Mains power unit supplied as standard. 1A 230V AC

SAVE £200

£600.00 £600.00

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ARR AR-8100

Adjustable Notch Filter

Eliminate interference and breakthrough on your scanning receiver from paging tones, voices, etc. with this fully adjustable Notch filter.

- Notch attenuation -40dB
- 50dB attenuation below 1MHz
- RX range up to 2000MHz

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ARR AR-8100

Adjustable Notch Filter

Eliminate interference and breakthrough on your scanning receiver from paging tones, voices, etc. with this fully adjustable Notch filter.

- Notch attenuation -40dB
- 50dB attenuation below 1MHz
- RX range up to 2000MHz

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Used Equipment

ALL SAFETY TESTED & GUARANTEED for 3 MONTHS

AOR AR-8600Mk2 Wideband Base Receiver **£499**

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Icom R7SDSP	0-60MHz Receiver with DSP unit	525.00
Yaesu FRG8800	General Coverage Receiver	299.00
Yaesu FRG-8800V	HF Receiver + VHF Converter	325.00

DAB Tuners

VIDEOLDIC ORX 601ES	DAB TUNER	159.00
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YAESU VR-2000

Yaesu's Flagship Desktop "Ultra Wideband" Scanning Receiver

- 0.1 to 2600 MHz
- Tons of features!

£599.95 £599.95

PAY BY CHEQUES/PREPAY

YAESU VR-200

Compact all mode wideband handheld, PC Programmable with ADMS-3 Software

- 100 kHz to 1300 MHz
- AM/FM/WFM/SSB/CW
- 1,000 Channel Memories

£199.95 £199.95

PAY BY CHEQUES/PREPAY

YAESU VR-1200

New D model with:

- NEW!** Charge Socket
- 0.1 - 1299.995MHz
- AM, FM, Wide FM
- Auto select channel steps
- 12 preset memories
- 89 channel Memory Bank
- 640 channel memory system
- Slot machine game!
- Optional extra Mains Adaptor

£159.00 £159.00

PAY BY CHEQUES/PREPAY

YUPITERU MY77100

All mode, wideband handheld Our No.1 Seller

- 530kHz-1650MHz
- 1000 memories
- AM/FM/WFM/SSB/CW
- Comes complete with: NiCads, mains charger, 12VDC cigar lead, belt clip, carry strap

£229.95 £229.95

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YUPITERU MY77100

200 Channels with Switchable AM/FM

- 66 - 88MHz, 108 - 170MHz, 300 - 470MHz, 806 - 1000MHz
- Modes: AM/NFM
- Memories: 200

SPECIAL OFFER

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Top of the range airband handheld with 8.33 kHz steps

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- 1000 Memories
- 8.33kHz Airband
- Duplex reception
- Describable function
- Supplied c/w: Mains adaptor • 12V DC lead • NiCads • Belt clip

£239.95 £239.95

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YUPITERU MY77100

Top of the range airband handheld with 8.33 kHz steps

- 520kHz - 1.32GHz
- 1000 Memories
- 8.33kHz Airband
- Duplex reception
- Describable function
- Supplied c/w: Mains adaptor • 12V DC lead • NiCads • Belt clip

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50Ω Coax per 100 metre drums (ADD P&P £10)

RG58 C/U Mil spec	£28 £25
RG213U Mil spec low Loss	£75 £55
H100 Semi Airspaced	£85 £65
Westflex 103 Ultra Low Loss	£60 £89
300 Ohm Twin feeder (slotted)	£80 £69
450 Ohm Twin feeder (slotted)	£90 £79

FLEXWEAVE (style) ANTENNA WIRE HIGH QUALITY VERY FLEXIBLE

- 168 strands of 14 AWG copper wire.
- Ideal for all your antenna projects

FLEXWEAVE

per metre.....55p .. +10p/metre P&P

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BEARCAT UBC700KLT

A stylish new Sports Scanner with 8.83kHz Airband steps

- Frequency: 25 - 87, 108 - 174, 406 - 512, 806 - 960 MHz
- AM/FM
- 100 Memories
- Twin Turbo Scan
- Alpha Numeric display
- Supplied c/w: Mains Adaptor/charger, Nicad re-chargeable batteries, Earphone, Belt clip.

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BEARCAT UBC700KLT

Desktop with trunktracking & PC programming (via 3rd party software) - a MUST HAVE for enthusiasts

- 500 channels
- 25-1300 MHz (with gaps)
- AM, FM, WFM

SPECIAL OFFER

£299.95 £299.95

PAY BY CHEQUES/PREPAY

BEARCAT UBC27ACKLT

Base Scanner with MW/FM Radio & Alarm Clock

- 25-956 MHz (with gaps)
- VHF Radio: 88-108MHz
- 100 Memories
- 20 Radio Presets

£159.95 £159.95

PAY BY CHEQUES/PREPAY

BEARCAT UBC1000KLT

- 25-550, 760-1300 MHz
- AM/FM/WFM
- 400 memory channels
- TURBO SCAN/SEARCH
- Automatic Freq Storage
- Selectable Attenuator
- Automatic Frequency Sorting
- Supplied c/w: earphone, case, belt clip, charger, rubber duck antenna

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BEARCAT UBC300KLT

SPORTCAT Twin Turbo Handheld

- Triple conversion RX
- 25-956MHz (with gaps)
- 200 memories
- Comes complete with: Antenna, Earphone, Belt Clip, Nicad battery, 240V UK Mains adaptor

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- 25-956MHz (with gaps)
- 200 memories
- Comes complete with: Antenna, Earphone, Belt Clip, Nicad battery, 240V UK Mains adaptor

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- 495 kHz-1309.995MHz
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Covers LW, MW and:

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Active Antenna and/or Matcher for Receiver use only. A low loss antenna tuner suitable for random long wire, dipoles, Beveridges, Delta loops, inverted V's, Verticals, G5RV and most receiving antennas. Or use as a standalone active antenna.

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Digital Worldband Radio with RDS

- Covers MW/LW/FM/SW
- SSB/CW reception on SW
- 307 presets
- Clock/alarm facilities
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- Clock (which remains on)
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- Joystick control of tuning/volume
- Select stations by name
- 10 Station Pre-sets
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- 20 hour battery life (3x AA size - supplied)
- External Power Adaptor
- AC Adaptor included
- 65(w) x 110(h) x 20(d) mm

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- Large multi-function LCD display
- RDS system on FM
- Menu display/selection
- Search/Manual tuning Rotary control for station selection
- 10 station presets - 5 DAB+5 FM
- Rotary volume & tone controls
- External DAB aerial socket
- Uses 4 x (D size) batteries
- 200(w) x 200(h) x 125(d)mm
- Weight: Approx 1.68kg

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DX Tuners Technical

The DX-Tuner system consists of:

1. A radio and antenna (we support all computer controlled radios)
2. Linux Server with the DX-Tuner server installed
3. Main portal server

When a user logs in to the portal they can have one of six levels; Guest, advanced, professional, site operator, editor, administrator.

When a user accesses a radio, the following process occurs;

1. The User selects a radio
2. Portal locates the Radio's dynamic IP in the database which is updated from the nodes frequently. The system is totally independent of dynamic domain names.
3. The Portal frames this IP and the user's browser starts negotiating a unique session for this radio with md5 encryption keys.
4. If the credentials are correct, the browser starts retrieving the Flash movie from the node IP. "Loading DX-Tuner" is displayed and the interface is launched.
5. Flash movie (Radio controller) starts communicating with the node via XML. This process provides a very consistent and secure system.

Behind the scenes there is a large management system that only the DX-Tuners administrators have access to. This allows them to create nodes, provide user management, newsletters etc.

The DX-Tuner portal platform is developed in Java 2 Enterprise Edition J2EE and the basic development tool is *IdegaWeb* from Iceland www.idega.is

The DX-Tuner server is written entirely in C and it features; Streaming server, MP3 encoding, radio control, chat-server, web server all in one application. The DX-Tuner controller is written in Macromedia Flash MX.

It was in 2001 that Andy Steven, who had since left NATS contacted Kelly again, this time on a personal basis he suggested that it might be worth while making a commercial network of Javaradio. Up until this time there had been no charge for users of the system.

After some consideration Kelly took Andy Steven's advice. A company called Javaradio International was formed. Andy and one of his friends developed the first portal in *PHP-Nuke* the open source professional portal system.

Kelly tells me that this was really rudimentary and crude. He didn't like the portal at all. He embarked on a search for a new concept. In the mean time, the subscriptions were coming in and we started the compensation plan.

Then there was a significant setback. Javaradio International were contacted by Sun Microsystems' solicitors, the copyright owners of the *Java* language, who instructed the company to stop using the name *Java* in their marketing due to copyright infringement. This was a huge setback.

Then in 2003 Kelly Lindman spent the entire summer developing a new Controller in Flash in pure rage. He also rewrote the whole portal in *J2EE*. Andy Steven who now had a new job in Shetland gave indications he wasn't going to be so much involved in the project, so Kelly started planning for DX-Tuners.com with his company gaining full control.

Kelly also told me that "Andy Steven has indicated that he will stand down from his responsibilities to DX-Tuners as he is too busy with business commitments. So I have now moved all business regarding DX-Tuners to Lindman IT AB in Sweden which is my company. The rights to the products have always been mine so..."

"From now on I am working hard to make this system totally self maintained - less administration".

As you'd expect, Kelly Lindman is seriously enthusiastic about radio and he personally has five DX-Nodes himself which are configured as follows.

DX Tuner History

It was a mere seven years ago, in 1997, that the system founder Kelly Lindman, who at the time owned a Yaesu FT-747GX with a CAT interface, developed some of his own control software for the FT-747GX. This in turn spawned the idea that a suitable interface could be developed in Java - the obvious happened and Kelly named the remote control application Javaradio. The FT-747GX was the first radio to be available and controlled via Javaradio. A year later Kelly added the Icom PCR1000, a solely computer controlled wideband radio to the capability.

The first network node was run by Kai in Broome Australia 1998. Kai was an early enthusiast aged just 16 years.

A short while later, in early 1999, Kelly was contacted by Andy Steven on behalf of a major commercial body. He purchased 20 nodes these were set up around UK and run as a privately operated network.

The Javaradio network continued to grow and by the year 2000 there were 20 operational nodes. Unfortunately, at this stage the administration was still rather crude and consumed many man hours.

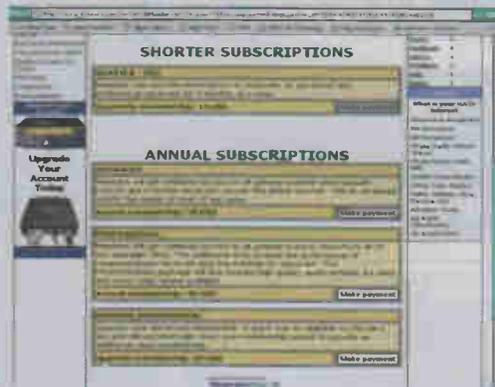


Fig. 6: Subscriptions page.



Fig. 7: The m.w. DX special node.

Tuner 1. PCR-100 (modified) Band 2 DX using nine stacked 8-element Yagi antennas towards Europe. For the real professional! This stunning Band 2 DX Tuner node in Malmö/Skurup, Sweden is capable of pulling in DX from 200km. It is possible to hear f.m. stations in the middle of Germany with usable quality any day of the week. Kelly says that, if you know how and where to listen, you can even hear things from the very south of Germany most of the time - and that's the best part of 1000km away.

Tuner 2. PCR1000 with a v.h.f. discone at 85m a.s.l. Extreme v.h.f. machine in northern Europe.

Tuner 3. Icom IC -R75 Rommele EWE array. Six EWE antennas in six directions switchable by the user.

Tuner 4. PCR100 Copenhagen airband node with a 131MHz Ground Plane at 80m a.s.l.

Tuner 5. Icom IC-735 m.w. DX node with a Beverage antenna some 400m long aimed at a heading of 270°. SWM

HF Aeronautical Traffic, ACARS & Weather FAX

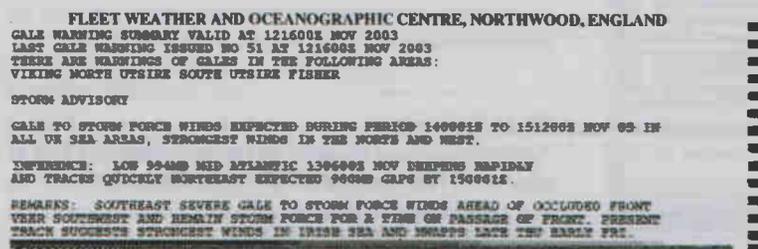
Big Ears' follows up on last September's h.f. oceanic article, showing you how to 'get going' and listening to the comings and goings in the skies above us.

In this final 'episode' I'd like to cover the basics of high frequency (h.f.) listening including weather FAX and I'll also cover ACARS and Selcall listening too. I am not going to get technical, there are many good articles in SWM that cover these aspects. All I am trying to do is to give those who want to get a foothold in the hobby a start with the basics.

HF Listening

There are numerous 'areas' in which h.f. listening is carried out. The first of these is listening to the air traffic controllers (ATC), which in the UK at least most people seem to listen on the North Atlantic (Oceanic) traffic. But it's also possible to hear h.f. traffic from other areas of the World. I've heard ATC traffic in Africa, India and the South Atlantic almost as well as from Shanwick.

Another area of listening is to Volmet (weather) reports which can be received both as voice and FAX. Again these reports can be received from many areas of the World. The



A graphically transmitted weather FAX showing a gale warning.

FAX weather maps can be printed out for many areas of not only Europe but other parts as well. Firstly, I am going to concentrate on the ATC aspect as Mike Richards has covered the Weather FAX several times in his excellent SWM column, 'Decode'.

First Requirement

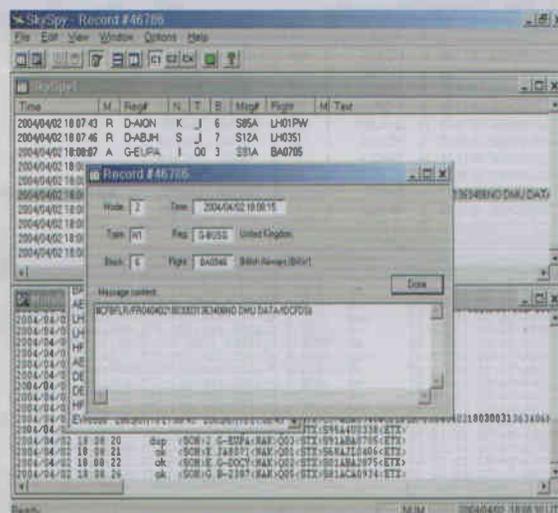
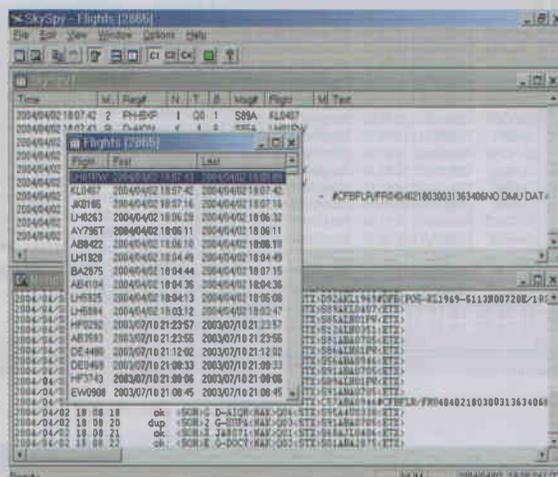
Your first requirement for h.f. listening, is a receiver that's capable of receiving 0.1 to 30MHz with single sideband (s.s.b.) capability, both upper (u.s.b.) & lower sideband (l.s.b.). Personally I feel that scanners can't cover h.f. as well as a dedicated h.f. receiver, my personal choice is a NASA Communications receiver HF-4E. Based on the, no longer made, AKD Target receiver, this wasn't an expensive radio and does the job very well.

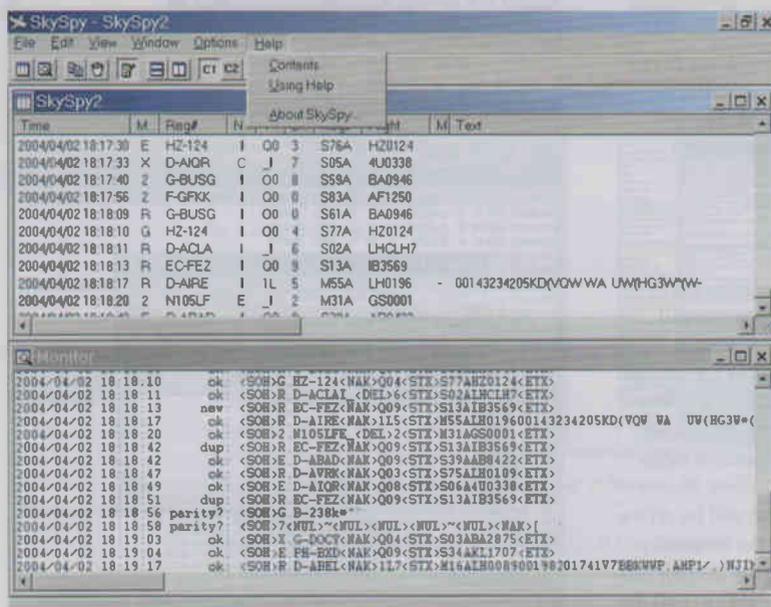
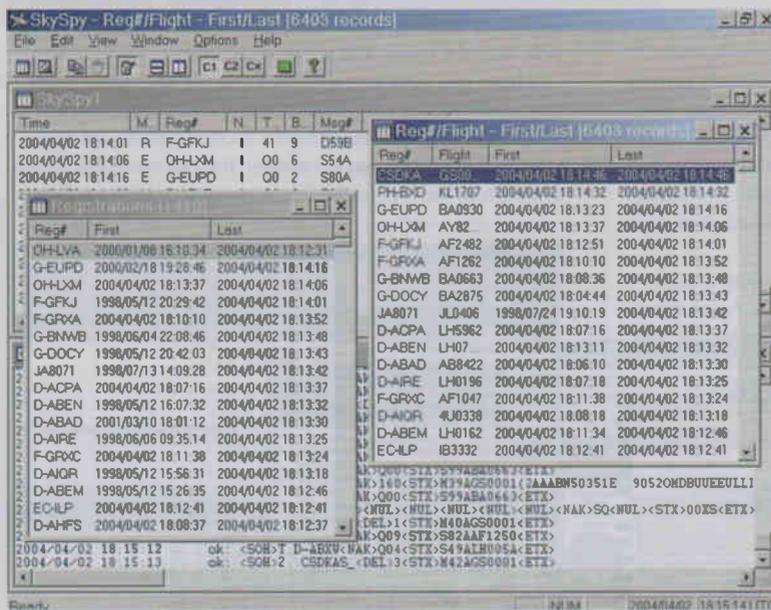
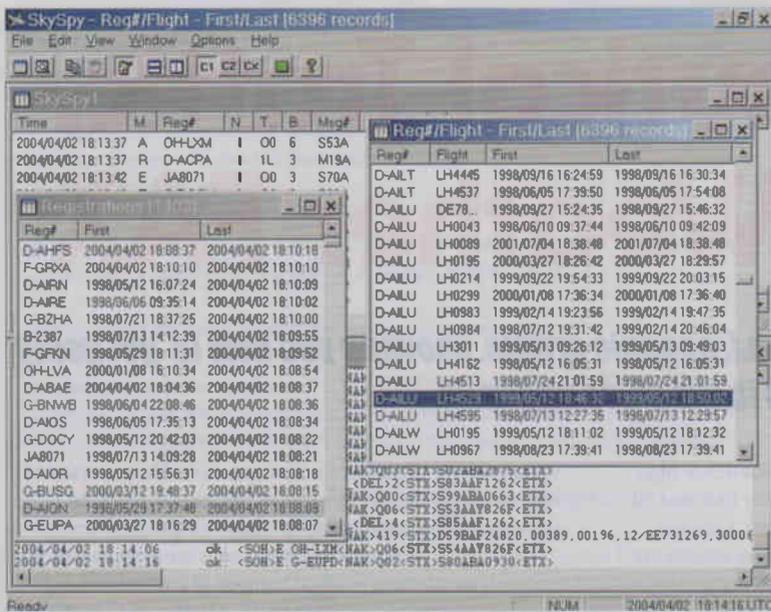
As most of the traffic you will be listening to will be on the upper sideband, if you tune your receiver to the frequency you wish to monitor, then that's it. A quirk of my chosen set, is that I have to slowly tune up around 1.5 - 2kHz to find the

station clearly dependent on propagation. The team at AKD who designed the NASA receiver, no longer make the receiver but there are plenty of others to choose from.

The next all important requirement is an antenna and this can be a simple long wire i.e. a piece of wire suspended between two points, as far apart as you can manage. If you'd prefer, there are commercial wire antennas. Though if you really don't have the space, you can get commercial vertical antennas, covering h.f. to v.h.f. These can be mounted on a pole near the house and are quite small.

I have two long wire antennas that are orientated north and south and east and west across the top of the house. One runs out of the shack on the second floor round to the corner of the house, up to between the chimney pots across to length of the roof to the opposite set of pots down to the





eaves and back to the shack. This one runs east-west and about 45m long. The other runs north-south across the roof. Both of these come down to a switch so I can select the one that gives me the best reception.

I also have a station earth that runs down to the backyard and is attached to a metal rod driven in to the ground next to an underground stream so, the ground is permanently wet. Not many people have this sort of earth, but if you make sure your earth rod is really well into the ground, but watch where you are putting it in - not through a water, gas, electricity, sewage main, etc! Do not use the heating radiators or other pipe-work in the house, that's asking for interference.

The final piece of equipment I use is an antenna tuning unit (a.t.u.), sometimes called an antenna matching unit (a.m.u.). This will allow your antenna to be 'tuned' to the frequency that you're monitoring, no matter what length your long wire is. I have made several of these out of bits from the 'junk-box', all of which have been successful. But at present I'm using a KRC-A-3 from the Kit Radio Company, which I find very good at its job.

Where To Tune?

Now let me look at the issue of what frequency to tune your receiver to. There are thousands of frequencies allocated to the world's aircraft. Some are for automatic safety systems, on aircraft, others are for air-to-air communications. Other frequencies are used to talk to the aircraft's operating companies on the ground. It may seem daunting at first but a company called Photavia have thought of this and have listed them all in a book called *Airwaves* which is updated annually. If you've not got a current one, then it can be ordered from the SWM Book Store Service. This book not only contains listings of all the frequencies in numerical order, but also in sections devoted to the different areas such as major world air routes or company operations. Many major airlines have their own frequencies for communications with their aircraft or for their agents.

What You'll Hear

Assuming you have the radio and antenna, now let's look at what you'll hear. Most of the ATC conversations that you'll hear take a certain format and I have included a form that I use that shows the format of these conversations. You will note that after the identity is established there are three positions given. The first two pieces of information are: an estimated time of arrival (ETA) and the flight level. You may also hear comments on the amount of fuel on board, in some cases the speed (Mach number) and the weather may also be given. Some of the positions are given as Way Points and positions of these Way Points can be taken from Charts or publications, which I have listed at the end of the article. The Way Points have names such as MIMKU or LAKEY and are all five letter names.

When the weather is included, the format used is: Position, Temperature, Wind Direction and Wind Speed. You may be surprised at how cold it is up there and how fast the jet stream winds are. At the end of these messages you also get requests for new Flight Levels and other bits of information such as a request for the ATC to pass their position to their airline or ATC will pass them messages from the airline. You will also hear Selective Calling letters (Selcalls) being given. These are four letter codes that are specific to an aircraft and allow the ground stations to call the aircraft if they have a message for it. This system lets the pilots to get on with 'piloting' without having to constantly monitor the radio.

When the aircraft's radio receives its own four letter code broadcast, it alerts the pilots with lights and buzzers that they are being called and they can respond. Again detailed at the end of this article is a publication that gives these Selcall Codes and allows you to find out exactly which aircraft it is you are listening to. There are also computer programs available on the market that can interpret these Selcalls. There's a wealth of information available in these conversations but it will take you a while to get used to the jargon.

One drawback with h.f. is that it can be noisy at times, either man-made or from natural sources, making it hard to hear what is being said. To counter the noise, I use an NES10-2 digital signal processor unit (d.s.p.) from bhi Ltd. However, if you want something to start with that will not break the bank, try the effective AAF-2002 Filter from SSE (02380-769598). I also use this unit and sometimes particularly on the Oceanic Traffic I find it more effective that the bhi d.s.p. unit.

That is the hardware out of the way but you are now hopefully getting a lot of numbers and jargon thrown at you which is meaningless so, at the end of this article I listed some publications you might find useful that will help you get the hang of the lingo.

Weather FAX

Using the equipment listed above you can also receive VOLMET Weather FAX reports from Shanwick (5.505MHz u.s.b.) and RAF VOLMET on (5.450MHz u.s.b.). These are just example frequencies. You can also with a suitable computer program receive the FAX Weather maps for various parts of the world. A quick call to Pervisell (01494-443033) and they will advise you on the best program to suit your computer and receiver. If you are interested in the Weather using your radio can give you a source of fascinating information. Again Mike Richards in his 'Decode' column has covered this in detail.

ACARS

The Aircraft Communications, Addressing & Reporting System (ACARS) is the next topic I am going to cover. ACARS is in use due to the demise of the radio operator in the cockpit (unless it's a Russian Aircraft that also carries an Engineer). The workload for the two pilots is eased using the ACARS system. It also cuts down on the time used in communications, not only cutting the pilots work load but also the 'time on air' allowing the airwaves to carry more traffic. Messages are transmitted as data, a 'Burrp' of sound signifies the message passed.

The transmitted message arrives in the cockpit or at the ground station as a legible signal on a screen or on paper. Many of the messages will be in data code and be concerned with engine data etc read but there is much else

Useful Information

Internet sites for ACARS to help understand the messages are as follows:

www.acarsonline.co.uk/aclink/about.htm

Another site that is almost the same but is

www.acarsonline.co.uk/aclink/almmsg.htm/

Of course, books (from *Short Wave Magazine Book Store* and *The Aviation Hobby Shop*) are eminently suitable for learning too. Below are some suggested starters though there are other publications. So, some books to consider are:

Airwaves 2004 (Photavia). Is ideal for the frequency listings and for the other ACARS Channels.

Flight Routings 2004 (TT & SJ Williams), This book will tell you where the aircraft has come from and where it is going to.

North Atlantic Route Chart will allow you to plot aircraft on a map of the northern Atlantic area.

Airlines to Europe (The Aviation Hobby Shop) will tell you which aircraft the messages are about.

Directory of Aircraft Selcalls From Seldec (01562-746620)

Airport and City Codes

Atlantic Western Approaches Way Point Chart

Directory of Airline Codes and Callsigns

including routes, weather, speed, fuel and other information (the Captain has left his spare vest at home!).

To receive and decode ACARS, you will need: a receiver covering the air band with a suitable antenna. A computer (or a dedicated piece of hardware to translate the data bursts into words on your screen). And of course a cable to connect the scanner to the computer or hardware.

There are many computer programs on the market which cover ACARS but the one I use is *Sky Spy* from Pervisell Tel: (01494) 443033. An advantage of using Pervisell is their tremendous back-up and after-sales service and I say that with sincerity having used their products for some years now.

One thing with *Sky Spy* is that you will need a demodulator, Pervisell can

supply one of these. A demodulator gives very good results, better than using the sound card system but it cannot be used on all Microsoft Windows Systems. Due to the way that the *Sky Spy* software 'talks' with its demodulator, it doesn't work on Windows XP so, if you're using this operating system, then consult Pervisell they'll be able to offer other solutions. But the solution may not be as cheap or as easy to use. There's a separate panel about how to set up and use *Sky Spy*.

The Receiver

Let me now turn to setting up the receiving side of things. Set the receiver up with a suitable antenna for the air band frequencies, of 131.725MHz or the secondary frequency of 131.525MHz using amplitude modulation (a.m.). There are other frequencies that are used, but these two are the main ones. Turn the squelch off so that there's sound from the receiver all the time. Then connect up the receiver to the computer via the demodulator and the supplied cable. At the receiver end, the pick-up cable goes into the audio output socket (earphone), while the output of the demodulator goes into either the COM1: or COM2: socket on the computer (these may be labelled Serial 1 and Serial 2).

Sky Spy The Program

Load the *Sky Spy* program onto your computer, then start it running. On the toolbar at the top right hand of the screen you will see two buttons 'C1' & 'C2' (these relate to COM1: or COM2:), you should click on the one that you have chosen to connect your demodulator to.

At the right hand end of the toolbar there's a button that should now turn green, showing that the audio is of the right level. If this doesn't happen, then adjust the volume on the scanner upwards slowly. When the button turns green the computer is receiving from the scanner.

Go into 'File' drop-down menu at the top on the screen and select and click on 'Message Log'. In the box that

continued on page 42

ICOM IC-R5

This little handy scanner is very simple to operate and is very popular among our commercial customers. The new IC-R5, complete with NiCads & charger.

ML&S £159.00 WITH FREE NICADS AND CHARGER!

ICOM IC-R10

Covering 100kHz to 1300MHz with AM FM WFM and SSB. Complete with Nicads, Charger and rubber helical wide band antenna all for only £319.99. Add the Super Searcher (£99.95) and RT-R10 (£109.99) for reaction tuning to nearby transmitters. PC Programmable. Requires PC-R10 at £39.95

**ML&S £319.99
ZERO DEPOSIT! 24 x £16.04**

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The Scanner with TV built-in that picks up a bit more than Coronation Street! Complete with Lithium Ion battery and charger, all ready to go! PC Programmable. Requires PC-R3 at £39.95

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Pocket Mini Scanner. 500kHz-1300MHz AM/FM and WFM. Ideal Go Anywhere pocket scanner. 12V DC! Now with NiCads and Charger.

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AOR AR-8200 MKIII

The best Handheld Scanner available with AM FM CW/WFM USB/LSB. Frequency range 530kHz-3000MHz. PC programmable and controllable. Requires PC-8200 £85. Complete with high capacity NiCads, Charger, Clear light lead, rubber helical wideband antenna, medium wave plug-in antenna. Add the Super Searcher and RT8200 (£119.99) for reaction tuning to nearby transmitters.

ML&S PRICE: £389

ZERO DEPOSIT - NOTHING TO PAY FOR 6 MONTHS!

YUPITERU MVT-7100

This scanner is very old in design and lacks a few features but offers good scanning facilities. Covering 100kHz-1300MHz AM FM WFM USB LSB. Complete with NiCads, Charger & Telescopic Antenna.

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MAXIMUM TR-100

Pocket scanner with 8.33kHz steps for the standard AM FM & WFM. Basic scanner at a basic price.

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MAXIMUM AR-100

This little all band scanner scans itself with the range of the all band.

ML&S £99.95



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Utilising the famous DSP Module from BH Instruments, our engineers have installed this superb device into three of our most popular all band receivers. This fantastic new installation (as featured in Short Wave Magazine, Dec '03) will drastically reduce noise on ANY MODE on any band. All the DSP functions are accessible from the top panel with a clear indication of DSP status.

Icom IC-R8500 DSP Wideband desktop receiver



Icom technology brings you wide band, all mode coverage from 100kHz to 2GHz. The IC-R8500 includes SSB (USB, LSB), CW, AM, FM and WFM modes. The IC-R8500 is not a scanner - it's a professional quality communications receiver with versatile features from high speed scanning to computer control.

The IC-R8500 DSP's many features include:
Full feature DSP audio noise reduction filtering professionally installed by ML&S

- IF shift which allows you to reduce interference from nearby signals
- APF (Audio Peak Filter) function reduces interference from signals superimposed over a desired signal by adjusting the centre frequency of the audio filter
- 'Built in' high quality crystal provides good frequency stability
- 1000 Memory Channels providing versatile operating possibilities
- An RS-232C serial port is located on the rear panel of the receiver for direct connection to a PC
- Versatile scanning functions allowing you to scan quickly and more effectively
- Selectable tuning steps
- S-meter squelch allows you to receive only those signals stronger than a pre-set level
- Optional voice synthesiser announces the frequency setting facility

Specifications:

Frequency Coverage : 0.100-1999.99
 Mode : SSB (USB,LSB) AM CW,FM,WFM
 Dimensions : 287(W) x 112(H) x 309(D) mm
 Weight : 7.0kg

Accessories:

AD-55 Mains power supplyIncluded
 Malcol GD-X30 Wide Band Discone Antenna£49.95
 Dressler ARA-60 Active SW Antenna£189.95
 Dressler ARA-2100 Active V/U/S Antenna£189.95
 CR-293 High stability crystal unit£89.99
 MB-12 Mobile mounting bracket£35.95
 SP-21 External Speaker£74.99
 UT-102 Voice synthesiser unit£32.99

**IC-R8500 DSP Only £1289 with DSP fitted
ZERO Deposit & 36 x £46.86
(without DSP £1139.95)**

AR-7030 DSP

High performance coupled to enhanced microprocessor features and facilities forms the cornerstone of its success.



Frequency coverage is from 0 - 32MHz all mode: AM, Synchronous AM, USB, LSB, CW, DATA & NFM. Four 455 kHz IF filters are provided as standard with provision for a further two (including Collins mechanical filters), all of which are 'self aligned' by the receiver for optimum performance and passband symmetry; this plus the standard fitted TCXO makes the AR7030 ideal for ECSS applications. The self tuning variable bandwidth synchronous detector is a pleasure to use and 'hangs on' to the weakest of signals, audio quality is superb.

Now fitted with the new Bhi DSP module it's even better!

**AR-7030 DSP Only £890.95
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ZERO Deposit & 36 x £32.68
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AR-8600mk11 DSP

The AR8600 Mark2 is an amazingly versatile receiver which can be used mobile, base or transportable...powered from an external 12V d.c. power supply, 12V vehicle or from an optional internally fitted NiCad battery pack. The upper frequency range has been extended to 3000MHz.



Full feature DSP audio noise reduction filtering professionally installed by ML&S.

- Frequency coverage 100kHz - 3000MHz no gaps
- All mode reception with Super narrow FM plus Wide and Narrow AM in addition to the standard modes
- True carrier re-insertion in SSB modes
- New front end with RF preselection of VHF-UHF bands
- Detachable MW bar aerial
- Tuning steps programmable in multiples of 50Hz in all modes. 8.33kHz airband step correctly supported
- Step-adjust, frequency offset, AFC
- Noise limiter & attenuator
- Versatile band scope with save trace facility
- Twin frequency readout with bar signal meter
- Separate controls for volume & squelch
- Write protect & keypad lock, lamp dimmer
- Programmable scan & search including LINK, FREE, DELAY, AUDIO, LEVEL, MODE

**AR-8600mk11 DSP
Only £1499 with DSP fitted
ZERO Deposit & 36 x £27.23 (without DSP £599.95)**

Already own one of the above? ML&S are also able to offer the DSP feature to your existing receiver. Price £149.95 includes return delivery. (U.K. mainland only)

AOR 5000

This is the finest communications receiver AOR have produced and has all the features needed for Commercial users and Scanning enthusiasts. There is also The plus version with extra enhancements. Offering good short wave reception as well as excellent VHF UHF performance. With FREE PSU. PC Controllable.

ML&S £1599.00 ZERO DEPOSIT! 48 x £47.31



ICOM PCR 1000 PC Controllable - NOW SUPPORTS WINDOWS XP

This sleek box gives all mode receive 100kHz to 1300MHz via your PC. Supplied with software for Windows 95, 98 and XP. Featuring DTMF decoder, CTCSS decoder, Spectrum scope and much more. We can supply you with alternative demo software that will work with XP (Registration is under £30.00). Complete with Whip antenna, PSU, UT-106 DSP module and software.

**Or with the UT-106 DSP Module fitted for only £399.98.
ZERO DEPOSIT then 36 x £11.63 (without DSP) 36 x £14.18 (with DSP)**

ML&S £319.99





Using ACARS information to overlay a map of Europe.

appears in response to the click, select the 'Open' button. You should now see a black dot next to the 'Message Log' in the File Menu. This indicates that what your receiving is being saved to file. One of the options for Sky Spy is to set this up so it comes on automatically every time you start Sky Spy. But if you don't set this parameter, then remember to start it otherwise you will lose a copy of all you have heard.

Next go to the 'Options' Menu and select 'Message Log File' Select the type of date readout that you prefer and then select 'Auto Save' from the same screen. Whilst in this screen select at what intervals you want the program to automatically save i.e. 10 minutes.

Once you have designed the screen layout to your liking then you can save it, again using the Toolbar.

Messages should start appearing on the screen but sometimes patience is required. It needs the aircraft to send an ACARS message before one appears on the screen! The pilot above you will not say "Oh look! So and so has just tuned into ACARS - let's send a message for him to hear". It can take 15 minutes (or more at times) before anything appears.

If you do not live near an airport you will not hear any of the up-link messages (messages from the ground). You can disable these from the toolbar also. You also might like to disable the 'SQ' messages as they are only test messages and have nothing in them.

The 'Message Screen' can get full very quickly and very bulky and you can delete those messages that are not of interest to you to save space and get rid of the dross. To do this click on the message that you do not want and then click on the dustbin near the left of the toolbar. You will be prompted to see if you really want to delete the message and if you do click 'YES'.

Then pull down the slider on the right of the screen to get back to where you were as deleting leaves you at the top of the screen with the first message you received displayed. Sometimes you can get a screen with up to 20 or so items but no messages against them and all for the same aircraft. I delete all but the first of the messages.

The Message Log Database gets very full in short order

and if you don't want to keep all the messages delete them at intervals using 'DELETE ALL' from the Edit Menu.

Printing Messages

If you want to print out the messages do the following: Using Windows Explorer open the Program Files sub-directory (folder) and then open the Sky Spy file. On the top you will see a date or dates. Click on the one you want to print out and use the Copy and Paste functions to transfer, as a file into the My Documents sub-directory. Then click on it and it will be opened in either MS Word or Wordpad. You can now edit the file, taking out all you don't want printed and even formatting the text if you want to. You can then, from within the editing program, print the text out, though you will not be able to keep the edited file.

One tip, I can recommend, is before you carry out your editing of the file, is to select all text, then cut the font size to 8-point, otherwise the printout can be an enormous number of pages, (15 pages for a mornings listening is not unusual). By reducing the font and editing it you can reduce the printout down to about half the number of pages. So, it may be only seven or eight pages per session rather than the

original 15 or so.

I think this is enough for you to be going on with and is sufficient to whet your appetite. You don't have to have everything I have listed to get you going. Start small and work up! As you get more experienced you can start plugging the gaps in your knowledge and spread the cost. Patience is a virtue in h.f. listening in particular but can be very rewarding and educational. Geography, flying and the weather are just three things I can think of.

Finally, remember one thing. What you are doing is actually illegal. Be discrete and don't shout about it. You could put the hobby in jeopardy for everyone. You will be amazed at what is going on above your head! Hope the above is of some help.

'Big Ears'



The Pervisell 'SkySpy' interface features a 'pass-through' audio lead that will fit into the Sound Card's input.



The main air corridors that cross over the UK.

Starting Out - Part 1

Due to much reader demand, this month we start the rerun of the excellent beginner series from the past written by the late Brian Oddy.

It was the advent of the modern multi-band transistor portable receiver, with its convenient built-in whip antenna that enabled many a listener to explore the short wave bands for the first time. The thrill of hearing a direct broadcast from some far off place in the world can quickly lead to further exploration of the bands and to the discovery that there is a whole new world of listening out there. Before you know it, you could find that you have become a short wave listener (s.w.l.).

Of course, the short wave broadcasters hope that when you hear their signal for the first time, you will become sufficiently attracted by their programmes to want to become a regular listener. Consequently, they usually offer a wide variety of cultural and religious items, discussion programmes, sports news, also bulletins of local and world news, which are often followed by commentaries. However, depending upon your political point of view, these may seem to be purely propaganda.

In an attempt to ensure that their signal reaches their chosen target area, many of the broadcasters use high power transmitting installations, capable of reaching virtually any area of the world provided the reception conditions are suitable.

It is possible to just search the bands for signals in the hope that they will prove to be interesting, without having any idea how the signals are reaching your receiver or how to get the best out of the prevailing reception

conditions at the time. Like any other hobby, there are many aspects that need to be considered if you are going to make a real success of short wave listening. In order to help you to get the best out of this fascinating hobby, I will be writing about some of the interesting technical aspects of it each month in this series. So, let us now start to look at things in more detail.

What Are Radio Waves?

Perhaps the first thing that we should consider is the very nature of a radio wave so that the commonly used terms like **wavelength** and **frequency**, which are so often quoted by broadcasters and s.w.l.s alike, can be understood and put to practical use. All radio waves have a number of things in common and the basic forces needed to produce them are generated in a transmitter.

It is the job of the first stage of the transmitter, usually called the **master oscillator**, to generate the basic radio signal. The heart of the master oscillator consists of a coil wire, called an **inductance (L)** attached to two metal plates which are insulated from each other, called a **capacitor (C)** to form a **tuned circuit**. A tiny electric current passes through the coil in alternate directions at extremely high speed, perhaps thousands of millions of times a second, dependant upon the values of L and C. The current is said to be **oscillating** as it moves in this way and each time it passes back and forth, it is said to have completed one **cycle** - see Fig. 1. The tiny oscillations are amplified in subsequent stages of the transmitter before being processed or **modulated**, to include the programme information. They are then applied to a radiator, or **antenna**, where radio waves (or more correctly **electro-magnetic waves**) are set up.

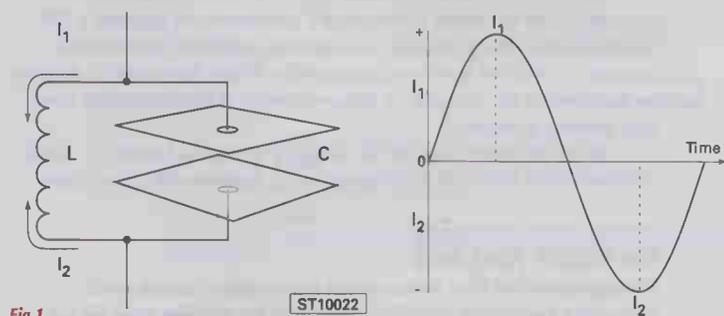


Fig.1

ST10022

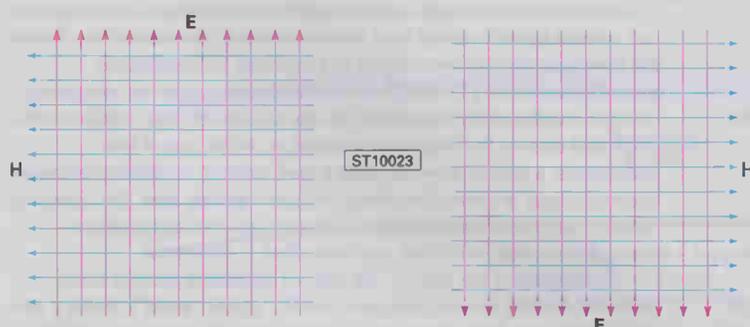


Fig.2: Wave travels out of page towards reader.

ST10023

Electric & Magnetic Forces

The waves consist of **electric (E)** and **magnetic (H)** forces which always travel at right angles to one another, see Fig. 2. By convention, the waves are said to be **polarised** in the direction of, or parallel to, the 'E' lines of force. The magnitude and direction of the 'E' and 'H' forces change with each half-cycle of the transmitted signal as they move away from the antenna in concentric spheres called **wavefronts** - see Fig. 3. They move away from the antenna at the incredible speed or **velocity (V)** of about 300 000 000 metres per second, or 186 000 miles per second, which is the speed of light. No wonder they can arrive at a distant location on the far side of the world almost instantly, for it only takes about one seventh of a second for them to travel around the world.

The distance travelled by the wave during one complete cycle of the transmitted signal is called the **wavelength (l)** and is measured in **metres**. It may be measured between any two points on the wave provided the field intensity is similar in magnitude and sign (Fig. 4). The rate at which the cycles occur is called the **frequency (f)** and is measured in **hertz (Hz)**.

Because radio involves high frequencies, it is necessary to introduce the term **kilo** meaning 1000 or 10^3 and **mega** - meaning a million or 10^6 . Thus 1000 cycles per second = **1 kilohertz (1kHz)**; similarly 1 000 000 cycles per second = **1 megahertz (1MHz)**. It is important to be able to convert kilohertz into megahertz and vice versa. Fortunately, the rules are very simple. To convert kHz into

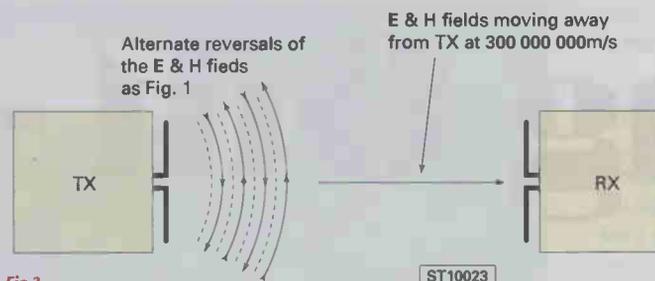


Fig.3

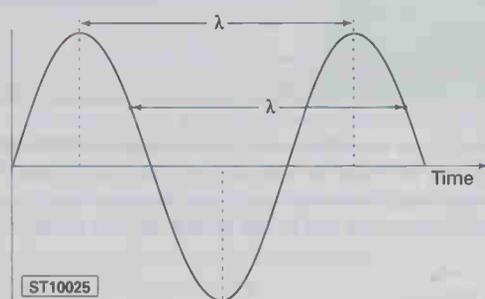


Fig.4

MHz move the decimal point three places to the left. For example, 7500kHz becomes 7.500MHz or simply 7.5MHz. To reverse the procedure move the decimal point three places to the right. Thus 2.4MHz = 2.400MHz = 2400kHz.

Wavelength

There is a simple relationship between velocity, frequency and wavelength, namely:

$$\text{Velocity (V)} = \text{Frequency (f)} \times \text{wavelength (l)} \text{ or } V = fl \dots (a)$$

By transposing formula (a) we obtain (b) and (c)

$$l = V/f \dots (b)$$

$$f = V/l \dots (c)$$

To make use of the formula in (b) and (c) we need only enter the value of either f or l since we already know that $V = 300\,000\,000\text{m/s}$ so let us now make some simple calculations.

Example 1: what is the frequency of station operating on a wavelength of 300 metres?

Using formula (c)

$$f = V/l = 300\,000\,000/300 = 1\,000\,000\text{Hz or } 1\text{MHz}$$

Example 2: what wavelength corresponds to 10MHz?

Using formula (b)

$$l = V/f = 300\,000\,000/10\,000\,000 = 30 \text{ metres}$$

Note: the formula can be simplified to $l = 300/f$ if the frequency is in MHz, so this calculation could have read $l = 300/10 = 30$ metres.

Spectrum

Armed with the fundamental terms of wavelength and frequency we can now consider the electro-magnetic spectrum as a whole. The low frequency limit is about 10kHz and it is important not to confuse a 10kHz radio signal with a 10kHz audio sound which consists of compressions and

rarefactions of the air - you cannot hear a 10kHz radio signal. The upper limit of the spectrum extends beyond 30 000MHz towards the infra-red and visible light regions. The various areas of the radio spectrum are classified into seven groups, as shown in the table.

The frequencies used by broadcast stations in the h.f. region are allocated under agreements drawn up by the International Telecommunication Union (ITU) located in Geneva. The topic will be discussed in a future article.

The Radio Spectrum

Division	Frequency Range
v.l.f. (very low frequency)	3kHz - 30kHz
l.f. (low frequency)	30kHz - 300kHz
m.f. (medium frequency)	300kHz - 3MHz
h.f. (high frequency)	3MHz - 30MHz
v.h.f. (very high frequency)	30MHz - 300MHz
u.h.f. (ultra high frequency)	300MHz - 3000MHz
s.h.f. (super high frequency)	3000MHz - 30000MHz

Broadcasting Bands

The nature of radio waves, the fundamental terms of wavelength and frequency and the electro-magnetic spectrum as a whole are discussed above. By international agreement, small parts or bands of the overall radio frequency spectrum are allocated to broadcasting, however, these do not include the v.l.f. region or frequencies above the u.h.f. region.

The Long Wave Band

The lowest frequencies used for broadcasting form part of the l.f. region and the segment involved is usually referred to as the **long wave (l.w.)** band which extends from a nominal 2000 to 1053m or 150 to 285kHz.

The broadcasters using this band try to ensure that most of the radiated energy from their transmitting antenna travels along the earth's surface via **direct or ground wave** paths to reach their listeners. As the signals follow the contours of the ground, they lose energy or become attenuated due to the resistivity of the surface. The nature of the land affects the resistivity. Flat pastoral country or marshy and loamy areas have a much lower resistivity than those containing rocks. Hills and mountains tend to absorb energy and sea paths introduce much lower losses than those over land. As the frequency of transmission is raised, the losses in the earth's surface increase, causing the ground wave range of a station to become less and less - see Fig. 5.

Because the ground wave signals from a l.w. station can travel considerable distances, a single high power l.w. transmitting installation may well cover the whole of the country concerned. An example is BBC Droitwich on 198kHz. In order to ensure that maximum ground wave coverage is obtained, antenna characteristics dictate that a vertical antenna be employed at the transmitting station - in view of the wavelength a very high antenna is required.

The broadcasters using the l.w. band are located in Europe, N. Africa and the Soviet Union and they operate in accordance with a band plan.

The Medium Wave Band

The segment of the m.w. region which is allocated to broadcasters throughout the world is usually referred to as the **medium wave (m.w.)** band, which extends from a nominal 571 to 187m or 525 to 1605kHz.

Due to the considerably increased attenuation of ground wave signals at m.f., several suitably placed m.w. transmitters would be needed to achieve the coverage obtained by a single l.w. transmitter. In practice, the transmitters used vary from high power installations which are designed to cover as much territory as possible, to very low power ones, which cover a small area close to the transmitter location. As in the case of l.w. installations, a vertical antenna (often a mast radiator) is used to provide an adequate signal to noise ratio (40dB) in a given service area. The noise may be from both man made and natural electrical sources and is present everywhere - more so in cities and towns than in rural areas.

On this side of the Atlantic, the stations are spaced apart at 9kHz intervals between 531 and 1602kHz, but in Canada, N and S America and some other areas they are spaced at 10kHz intervals, starting at 530kHz.

The Ionosphere

So far only the waves that travel along the surface of the ground to reach the listener have been considered, but what happens to the waves which leave the transmitting antenna at an angle to the earth's surface? They travel upwards through our atmosphere and the stratosphere to reach a region of rarefied gases which surround the earth called the **ionosphere**. The ultra violet and X-ray radiations from the sun ionise the oxygen, nitrogen and nitric acid present there to form ionised layers. Since the radiation and position of the sun are constantly changing it allows that the state of the ionosphere is also changing by day, night and seasonally. The layers that form the ionosphere exist at different heights above the earth and to distinguish them they are termed the D, E, F1 and F2 layers - see Fig. 6.

During the hours of daylight the D-layer absorbs most of the waves reaching it, so ground wave signals predominate. At sunset the ionisation of the layers starts to decrease and the D-layer quickly disappears to expose the E-layer. For some time after sunset, the ionised E layer acts like a giant mirror in the sky and reflects the waves which reach it back towards earth. Such reception at night is said to be via the **sky wave** path and its via this mode that reception of m.w. signals from countries which cannot be heard during the daylight hours becomes possible. After sunset, the E layer gradually de-ionises to reach a steady night time lower level of ionisation and the m.w. signals can then pass through it to reach the F2-layer. The F2-layer then reflects the signals back to earth, but since the signals have passed twice through the lower layers they are, to some extent, attenuated.

After Dark

During darkness, the skywave signals can arrive in many distant areas and some broadcasters take advantage of this fact to provide a service beyond their normal ground wave range. For example, there is RTL on 1440kHz. However, the sky wave signal from a particular transmitter can also arrive within its own service area and when this happens in the outer limits or fringe areas, considerable fading and distortion can arise.

The fading is caused by the combination of the ground and sky wave signals and is due to the fact that the strength and phase of the sky wave signal is not constant, but continually varying - it may add to or subtract from the ground wave signal at any given instant and so produce fluctuations or fading. Provided all parts (carrier and sidebands) of the sky wave signal arrive together, there will be no distortion present when the signal fades. However, if all parts of the sky wave signal are not reflected equally, then severe distortion of the resultant signal will exist during fades - this is

called **selective fading** and is very objectionable! The overall effect of the combination of ground and sky wave signals is to reduce the normal service area.

The maximum practical distance that can be covered by a single reflection via the E-layer at night is about 2000km.

However, if darkness is present throughout a very long path and reflection is via the F2-layer, considerable distances can be covered - m.w. transatlantic reception becomes possible. At sunrise, the sky wave signals rapidly fade out as the D-layer reforms and once again the ground wave signals predominate.

Many listeners enjoy tuning across these bands at night for new stations and in view of the large number present a receiver with a built-in directional antenna can help in separating the stations. A guide book detailing the frequencies used by broadcaster can help in identification - see Appendix.

Next month some of the segments of the radio spectrum (or bands) allocated to broadcasters in the h.f. region will be examined.

Further Reading

Radio Stations in the UK, 19th Edition, £3 (UK). Available from BDXC-UK, 126 Bargery Road, Catford, London SE6 2LR.

Radio Listeners Guide, 2004. £5.45 plus P&P, SWM Book Store.

Passport To World Band Radio, 2004 (PASS24), £17.50 plus P&P, SWM Book Store.

World Radio & TV Handbook, 2004 (WRTH24). £22.00 plus P&P, SWM Book Store.

SWM

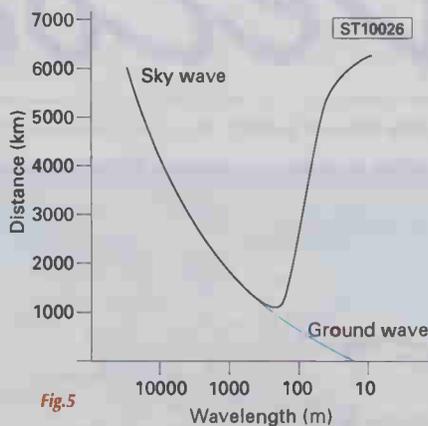
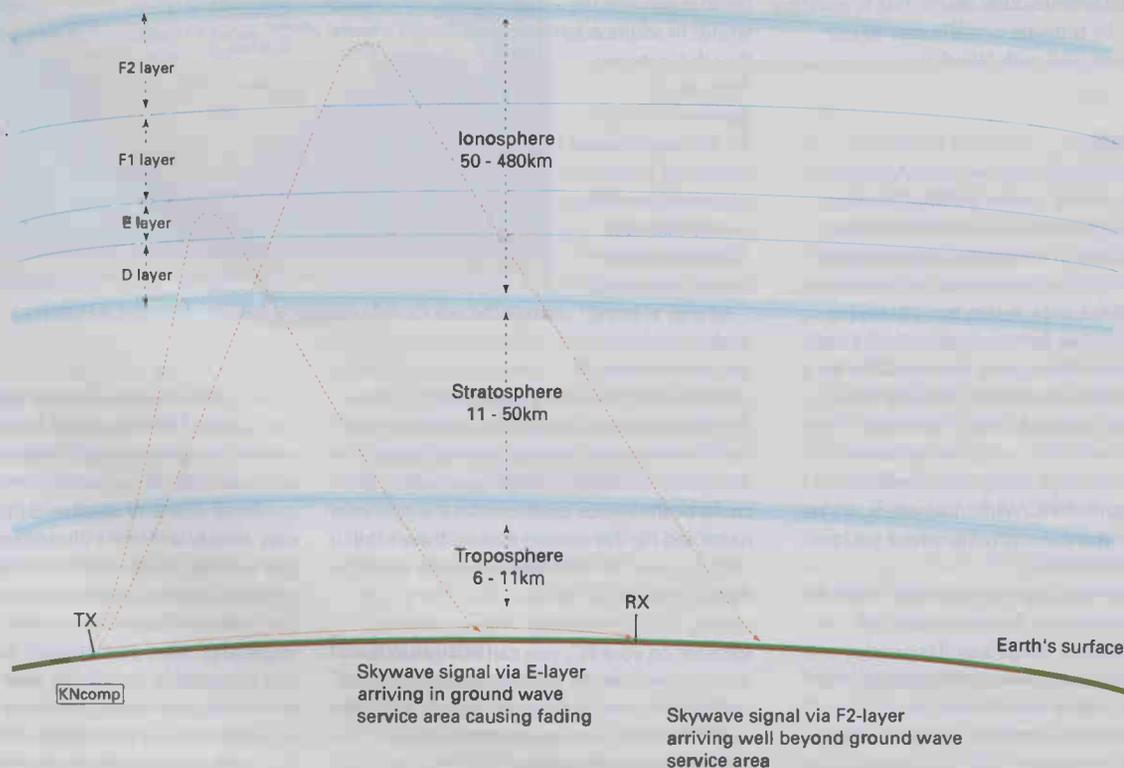


Fig.5

Fig.6



Decode

- **Mike Richards G4WNC**, 49 Cloughs Road, Ringwood, Hants BH24 1UA
- **E-mail** decode@pwpublishing.ltd.uk **Web site** www.mikespage.btinternet.co.uk

Good news for airband enthusiasts this month the latest version of AirNav System's *ACARS Decoder 2.1* is now available for download from their website. I first mentioned the changes to their much improved *ACARS Decoder* a couple of months ago, but version 2.1 builds on the already impressive features to include more Internet connection information and a menu option to browse the photo folder. In addition, all reported problems have been fixed in this release. If you're looking for an ACARS decoder to keep up-to-date with aircraft movement the AirNav solution is well worth a close look at www.airnavsystems.com

As well as providing very effective direct decoding of ACARS signals the program includes a host of advanced features for listeners with access to an Internet connection. The one to impress your friends with is its auto download of aircraft photos from the www.airliners.net website. Seeing the aircraft message arrive and almost instantly followed by a good quality photo of the actual aircraft never fails to impress! You can also use the decoder to connect to Internet based ACARS servers to capture messages from around the world. Just to add to the fun, the software is really easy to use and integrates well with *Windows*.

Main Feature

The main feature for this month is Automatic Position Reporting System (APRS). This is a packet based information system that's been growing rapidly in the amateur fraternity, but carries a lot of information that's of interest to listeners, hence its inclusion here. In simple terms APRS is just the marriage of Packet radio and the Global Positioning System (GPS). It's a simple and obvious alliance, but one that creates huge potential. One of the basic features is the facility to include accurate position information along with standard packet transmissions. Whilst interesting, it's no big deal, as you can easily say where you are at any point in time.

The development step that has really made the difference is the use of an Unconnected Protocol for APRS broadcasts. The subtle difference with Unconnected Protocol is that the sending station doesn't need to synchronise with a receiving station it simply 'blurs-out' its position! This might sound a bit

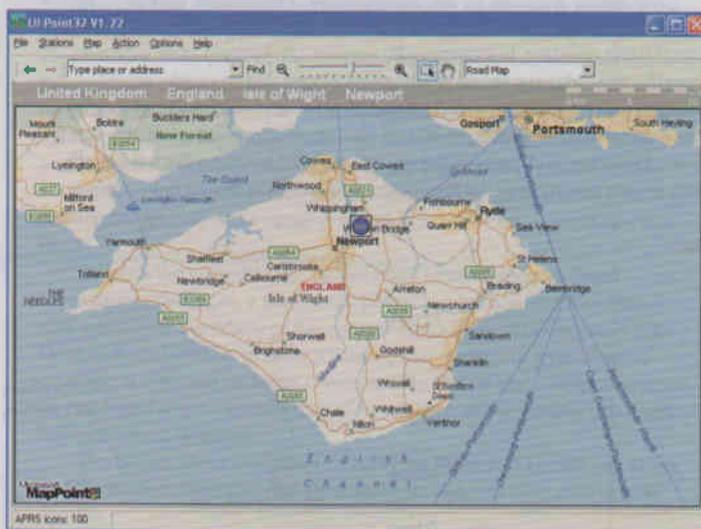
crude, but it does save a lot of packet time that would otherwise be wasted airtime. Whilst it's all very well broadcasting these APRS unconnected packets, what happens next and how do they get used?

To make the system work you need your local repeater to be running APRS software. If this is the case, your APRS packet will be captured, broadcast locally and forwarded into the main APRS network. The scope and range of the APRS network is huge and a local APRS signal very quickly finds itself broadcast across the world! In addition to the v.h.f. network there are h.f. gateways available for the long distance routes. All this is supported by APRS servers that store APRS data from around the world.

As well as being used to report the position of radio stations, APRS has many extensions to allow the association of a range of information with each transmission. Perhaps the most basic is the facility to include station information, this could be the station position plus the operators name and rig. For mobile stations there's the option to use the GPS data to include speed data as well as the position. Now things are starting to get interesting! With appropriate software on your PC, you can track mobile amateurs with really accurate speed, direction and altitude data. But for the listener, probably one of the most interesting extras is the broadcast of weather data.



AirNav's Brand New ACARS Decoder 2.1 in action.



MapPoint and UI-View working together.

There are now a number of manufacturers that can supply APRS interfaces to allow data from amateur weather stations to be broadcast automatically. This creates a new and readily available source of weather data that's really easy to use. With the right software on your PC you will see all the weather stations neatly plotted on a map and you just have to click on the stations to see a full weather report pretty impressive. Now I've whetted your appetite, you're probably wondering how to get listening. Fortunately, this is easy, you can even do it without a radio if you want to. But to listen off-air, you'll need a v.h.f. receiver that covers the

...bring your scanning activities to life.

145MHz bands as well as a packet radio TNC.

You can usually find second-hand TNCs for sale quite cheaply, either at local radio rallies, free newspapers or even on eBay. If you have the basics then you need to get yourself some dedicated APRS software. There are many packages around, but the most popular seems to be *UI-View* by **Roger Barker G4IDE**. If you want to take a look and download the latest software the UI-View website can be found at: www.ui-view.com On this site, you'll find lots of useful information about APRS as well as downloads of the software. At the time of writing you need to download the 16-bit application to try the demo. If you like it you can simply upgrade to the full 32-bit application *UI-View32*.

All credit to Roger as not only has he produced an excellent decoding package, but registration is a very modest £10 plus VAT. If you find the program useful, please register to help sustain the development of *UI-View*. That way we see even more features in future versions. Once you've completed the download and automated installation routine, you're ready to run the program for the first time. A neat feature of the program is the forced help prompts that occur on first use. Basically every time you choose a menu item that requires some set-up parameters, the appropriate help screen appears to tell you what you have to do.

The only point to watch here is that the prompts have been designed for radio amateurs so many of the items refer to settings that are only needed if you're going to transmit. This is no real worry because the help screen only appears once for each of the menu items. After following the instructions to set-up the software you can connect-up to your receiver and start monitoring. The best frequencies to monitor are 144.80MHz f.m. at 1200 baud for v.h.f. APRS signals. You can also find APRS on h.f. and the following are the 'standard' frequencies: 7.035, 10.147, 10.151, 14.103, 14.105, 18.102 and 21.117MHz.

If you just happen to be really lazy or don't want to go straight to using a packet TNC, there is another way! Many of the APRS Servers I mentioned earlier are connected to the Internet that means you can simply download the data directly to your PC. You'll be pleased to hear that *UI-View* has all you need to access the data including an up-to-date list of APRS servers, though to use the service you first have to set it up. To set up *UI-View* just follow the instruction in the help file it's very straightforward. When the set-up is complete you just use the 'Actions' menu and choose 'Connect to APRS Server'. Once the connection process is complete you should

see the APRS packets scrolling past at a rate of knots in the status window at the bottom of the display.

At the same time APRS icons should start to appear on your display. Remember that APRS servers are global so if you only have a UK map displayed you will find that you just see occasional bursts of activity. If you're not sure which APRS server to choose I found aprswest.net to be very good. It has loads of data and there was always plenty of UK activity on the maps. When you start seeing APRS icons you can use your mouse cursor to explore some of the information that's available. To explore the source, just right click on the icon and choose 'Details' you will then be presented with a drop down box showing basic information about the station. You should also see a 'More' button towards the top right. Press this and more information will be revealed.

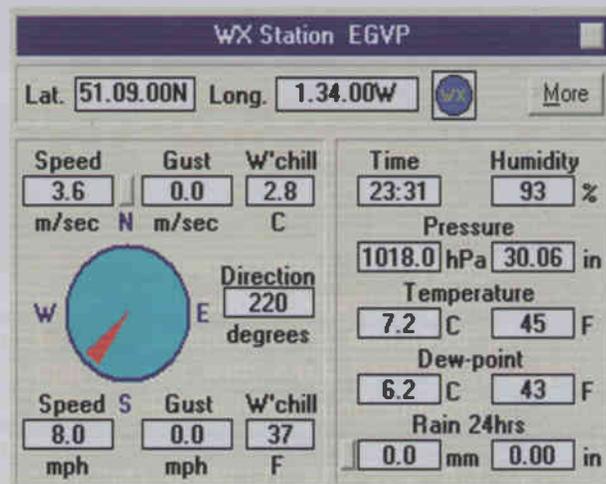
The interesting station types are those showing the 'WX' icon. The WX icons are for weather stations and usually have a comprehensive set of up-to-date weather measurements available. Asking for 'Details' will normally reveal a detailed screen showing wind direction, speed, wind chill, dew point, temp, pressure, humidity, rainfall and the all important measurement time. Because many amateurs have invested in these automated weather stations you will find them spread throughout the APRS areas. It's really easy to use this reporting system to check the weather around you and see where the rain is. For example, if you know there's rain spreading in from the West, it's very simple to spot a few stations to the west of your home and see if it started raining yet! Put that together with the wind speed data between you and the first station with rain and you can start to predict when the rain will reach you!

Fascinating Stuff

This is fascinating stuff and a great way to make use of the APRS data. If you get bored with this, another area to try is plotting APRS icons on good quality maps, for which there



Roger Barker's Excellent *UI-View* for APRS.



UI-View Weather Information Screen.

are a number of third party software packages. From what I've found so far you can plot onto *Street Maps*, *MapPoint* and *Autoroute* to name just a few popular packages. Most of the software to do this can be found using links from the *UI-View* home page I mentioned earlier. I tried this with *MapPoint* but it was a bit slow and cumbersome, I hasten to add this is not a problem with *UI-View* but with Microsoft's *MapPoint*, which is not too good at plotting push-pins.

I haven't had a chance to try any other maps yet but if you have then please drop me a line to let me know how you get on. If you want to keep up-to-date with developments with *UI-View*, there's even a web newsgroup you can join. The newsgroup is hosted on Yahoo and you just follow this link to join: <http://groups.yahoo.com/group/ui-view/join> Overall this is a fascinating mode that will continue to grow with more new features being added.

Shack

Web

- **Jerry Glenwright** do SWM Editorial Offices, Broadstone
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Hello and welcome once again to ShackWeb, the bi-monthly round-up of the best the web has to offer fans of radio, old silicon, gadgets, home-brew projects and the like! Last time we had a look at websites devoted to your listening pleasure, but given that most of us still prefer to tune-in in the conventional sense, this time around I'd like to look at sites which are geared to other aspects of our hobby: home-brew and kit building.

Bits 'N' Pieces

Though Maplin www.maplin.co.uk continues as arguably the high street source of

rings up 11p at the till - groan...

All of which goes some way to explain why I decided to see if there were any on-line resources for buying components in the UK. Needless to say I was not disappointed. Perhaps the best-known of course, is RS, a stalwart of the constructors' scene and one which maintains an excellent web presence. Once registered, you can roam at will through the RS inventory, selecting items to buy and using a credit card to complete the transaction. Trouble is, there's a minimum cost for shipping which can run to more than the total of the parts you require. However, for comprehensive stock there are few better suppliers. See rswww.com



components in the UK (especially with the demise of the quirky but useful Tandy), the company's range of components for building projects seems to grow smaller every time I visit the shop. Once upon a time - say 10 years ago - the Maplin catalogue was an annual treat, packed with data sheets and so on which made it more like a reference work than a sales/mail-order catalogue.

I imagine that Maplin is feeling the weight of economics and devoting the available floor space in its shops to those items which sell quickly and at a comfortable profit rather than catering to the likes of you and I who might 'pop in' for a few capacitors and resistors and a DIL header plug or two!

Of course if you do visit a Maplin shop for components and find they're not in stock, Maplin will order them from a central depot and telephone you when they're available, but there's something very silly about being rung up and asked along to pick up a single 47kΩ SIL resistor pack that has been specially ordered. A smirking schoolboy hands over an outsized polythene packet as light as air containing one microscopic component at one end of the shop and you duly carry it to the other where another smirker with the appearance of someone yet to reach his teens

excellent shop in Hove and a good web presence at www.bullnet.co.uk Others that are well worth a visit include www.esr.co.uk and www.magenta2000.co.uk

RS and Maplin are perhaps the best-known of the conventional suppliers but Distel is surely one of the leading surplus outlets www.distel.co.uk An on-line Aladdin's cave of all things left over from previous applications, you can spend many a happy hour paging through the seemingly endless interesting bits and pieces at the Distel website (18 million items according to the company). A similarly well-equipped surplus supplier is the Sussex-based Bull Electrical with an excellent shop in Hove and a good web presence at www.bullnet.co.uk Others that are well worth a visit include www.esr.co.uk and www.magenta2000.co.uk

Meet Joyce

Ever heard of Joyce? Fans of old computers or those who were considering the purchase of a workhorse machine in the 1980s might well have. Joyce is the nickname of the PCW range of machines made by Amstrad (Joyce being the first name of Amstrad proprietor Alan Sugar's secretary).

Today, the Joyce can be picked up for a 'song' at boot sales, computer rallies and the like and still makes for an excellent tool in the shack. Bundled with competent word processing software (LocoScript) many were used simply as glorified typewriters at first. Lurking beneath the word processor however was a true computer able to run CP/M, a small systems OS from the real world with a wealth of serious software available. Consequently those who explored the capabilities of their Joyce were well rewarded...

One excellent project that I'm aware of dates from our very own SWM of a few years back and involved the computer being linked to the external keypad of a Lowe HF-225 to

provide a primitive, but effective form of computer control. Available radio-oriented software includes Morse tutors, propagation predictors, logging utilities and more all available for download from CP/M PD sources.

There are some excellent web support sites for both the Joyce and the CP/M operating system it runs. Several flavours of CP/M are available together with the source code should your desire be to customise it. There are many FTP sites for PD software, including what was once commercial, but is now in the public domain. Try typing PCW into any search engine.

The best by far Joyce-specific sites are John King's pages at www.pcwking.freemove.co.uk and Ron King's site at www.king27.freemove.co.uk Both are packed with hints and tips, detailed repair and upgrade guides, spare parts, pictures, software to download and much more. John offers advice via the telephone (details at his web pages) and undertakes repairs and upgrades for owners who'd prefer not to tinker themselves.

Roll Your Own

Nowadays the programmable microcontroller of choice is the PIC, an adaptable little device that can be put to many uses in all kinds of projects, but just a few years ago the Erasable Programmable Read-Only Memory (EPROM) chip reigned supreme. Commonly housed in 24-, 28- and 32-pin DIL packages, the EPROM could be easily programmed with your custom control software and then embedded in a project. Eight to 64K devices of the 27-series were most common: 2764, 27128, 27256 and so on.

EPROMs are programmed with a pulsed 12.5V (21.5V for some devices) and the code remains intact for a number of years though the charge will gradually leak away and must be reprogrammed. The device is erased using ultra-violet light, generally in the form of a small UV bulb in a protective housing. A number of programmers and erasers were marketed over the years, some intended for hobbyists, others aimed at the professional user.

All very well except that just about now, EPROMs coded in the 1980s are in danger of losing their software - not that the world will come to an end mind you, but you might find that a gadget in everyday operation no longer works. The solution? Read the code from the EPROM, back it up, erase the device and burn again - good for another 20 years. The difficulty? No affordable EPROM programmers! Yes, they are still available, but you'll find nothing under a hundred quid unless you turn up a hobbyist device second-hand and they're pretty thin on the ground.

The answer is to build your own using just a few pounds worth of parts and readily downloadable plans and software from Internet sites. One of the best designs can be found at www.zws.com/products/epromr2/ and with modifications, updates and Maplin product codes at www.mikeg2.freemove.co.uk/eprom this site also features plans for a cheap home-brew eraser too. Do it now while you still can...

Until next time, good surfing and, as always, good listening!

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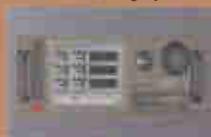
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Amateur

Bands

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In response to my coverage of the G5JJ antenna in *SWM* March, **Derek Ferguson** in Devon enquired about the importance of resonance and matching regarding antenna installation.

Hopefully, the following will throw a little light into that recess of antenna knowledge.

Energy Transfer

When trying to receive a signal the idea is to get as many of the electrons as possible in your antenna 'excited' by the signal you're trying to receive and then get that energy down to your receiver. Step one is to get an antenna that resonates at the desired frequency.

A straight wire that is half a wavelength long is good, but resonance can also be achieved with any appropriate combination of inductance and capacitance. Bending a wire antenna will alter its resonant frequency, so that the wire length will need to be altered from the theoretically correct length in order for the antenna to resonate at the desired frequency.

Different antennas have different characteristics. Some have greater gain in some directions, others can be compact and convenient to deploy. It depends on individual circumstance, which is the most important factor. You pay your money and makes your choice!

Step two is to get the r.f. energy from the antenna to the receiver. Assuming that the antenna isn't connected directly to the set, then the likely route is along coaxial cable. A typical receiver will have an input impedance of 50Ω. This means that its internal tuned circuitry is designed to respond most favourably to a given signal if it is presented by a source i.e. the antenna, that has 50Ω as its impedance.

As many of you will know, maximum energy is transferred from a source to a load if the impedance of both is the same. The trick with antennas is to connect the coaxial feeder to a point on the antenna where the impedance is 50Ω. The middle of a half-wave dipole is pretty close having a theoretical value of around 70Ω. If the coaxial cable is connected elsewhere along its length, the impedance at that point will be different so, the efficiency of the energy transfer will be reduced. This can be overcome by inserting a transformer at the connection point to match the impedance at that point to 50Ω.

The G5JJ antenna is an example where the impedance at the connection point on one end of the wire is much higher than 50Ω and a toroidal transformer is used to match the impedances.

Any antenna is only resonant at one frequency and some specific multiples of that frequency.

Using it at other frequencies reduces its effectiveness. The usual option then is to use an antenna tuner to best match the impedance the antenna system present at the frequency on which it is being used to that of the receiver.



Mix & Match

Sometimes a receiver will have two antenna inputs of different impedance and will label the 50Ω input 'Low Impedance' or shorter as 'Lo-Z'. The higher impedance or Hi-Z input is intended for direct connection of a long wire as the impedance at the end of a wire antenna is very high.

However, with the many compromises operators have to make regarding antenna installations causing unpredictable effects on impedances, using the 'wrong' connection might produce better results!

No More M0 Calls?

This month's *SWM* features a letter from **John Goodall G0SKR** of Christchurch Amateur Radio Society (CARS, *not to be confused with Chelmsford Amateur Radio Society*. Ed) bemoaning his club's inability to make the RSGB publish details of the Intermediate licence courses it runs. He is right to complain.

The CARS is very active, is a registered exam centre, and member of the RSGB. So, why is its good work kept a secret by the national society?

I wish I didn't have to keep writing about this, but there is a big problem with the take-up rate of Intermediate licences. It is pitiful. Bearing in mind that it is now necessary to obtain an Intermediate licence before going on to the Full licence, new holders of M0 calls are going to become very thin on the ground. It can't be good for the hobby not to encourage improving technical knowledge amongst its participants.

Surely more M3s want to move up the

licence ladder? Surely more than the current handful of clubs offer Intermediate licence courses? If you're a club that runs Intermediate courses, let me know and I'll include your details here in *SWM*. Of course, if the RSGB got a grip...

Not All Bad News

To add a note of encouragement for those who are certain of the imminent demise of the hobby, there are more amateur radio licences now than there were a year ago. Not many, it has to be said. But more is more.

In February this year there were just over 61,500 personal licences issued, up over 700 on the previous February. The biggest increase, as would be expected, was in the number of Foundation licences. Full licences were up by almost 60 and intermediates just over 20. Only Club licences were down in number, by 31 to 1025.

Calls to Listen Out For

Etienne Swart ZS6Y will operate **ZS10RSA** from the Republic of South Africa to celebrate the tenth anniversary of the country's first post-apartheid elections, which took place in late April 1994.

Further east out in the Indian Ocean on the island of Mauritius, **Walter Philar** will be using the call **3B8/DL3LBP** for three weeks from the first of the month. Listen out for him using RTTY, as well as s.s.b. and c.w. from 7 to 29MHz.

Much closer to home, **Jim Martin M0BQI** is planning to operate from the uninhabited island of Lunga, off the north west coast of Mull, for a long weekend from 30 April to 3 May. With an area of only 200 acres, the volcanic island lost its human population almost 150 years ago. Now owned and run by the Hebridean Trust, the island's abundance of plant life led to its designation as a Site of Special Scientific Interest.

Propagation

forecasts

- Jacques D'Avignon VE3V9A
- E-mail: Jacques@pwpublishing.ltd.uk

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.

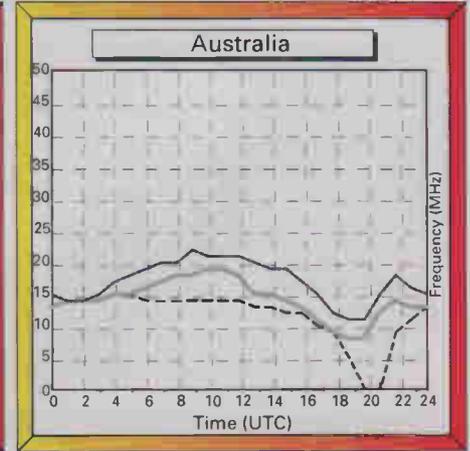
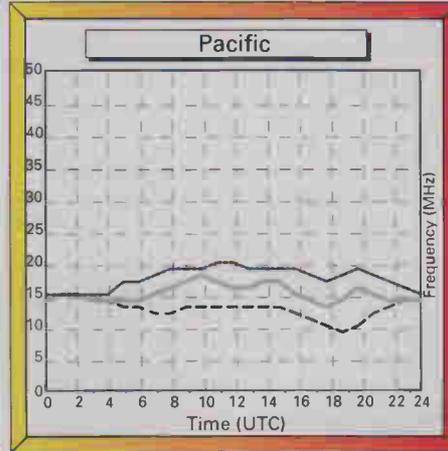
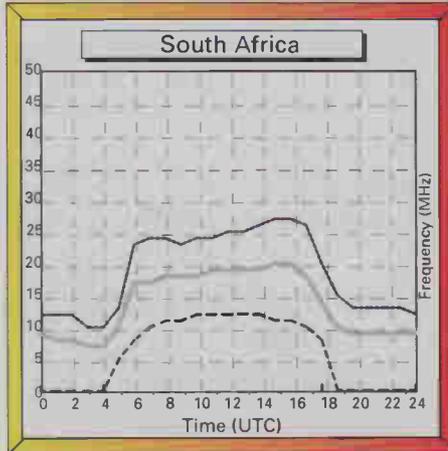
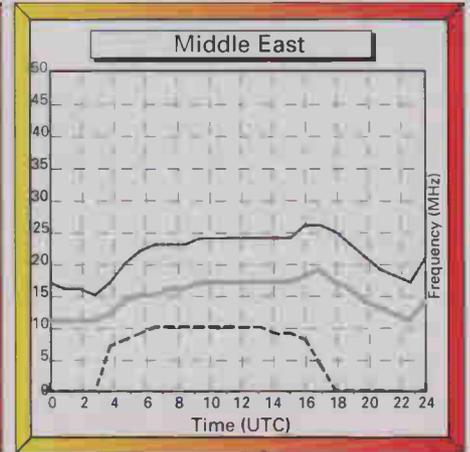
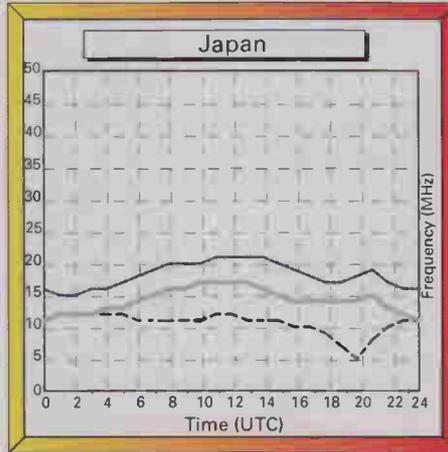
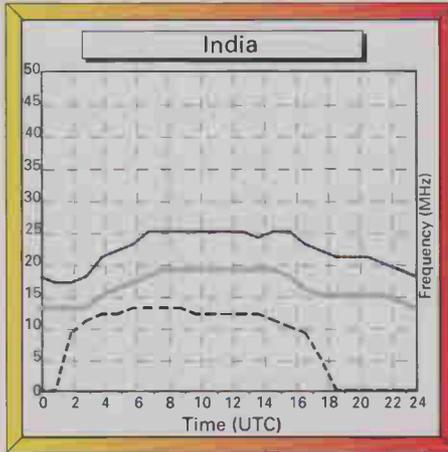
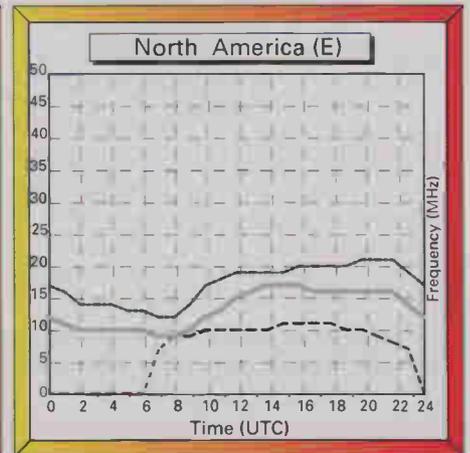
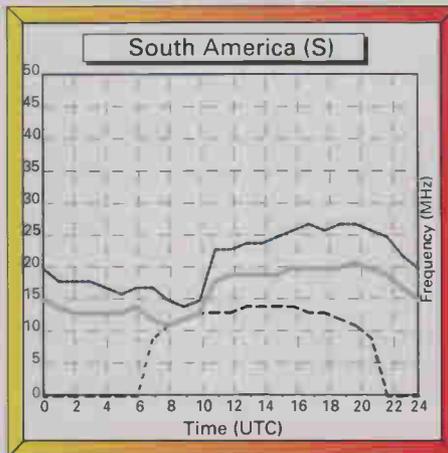
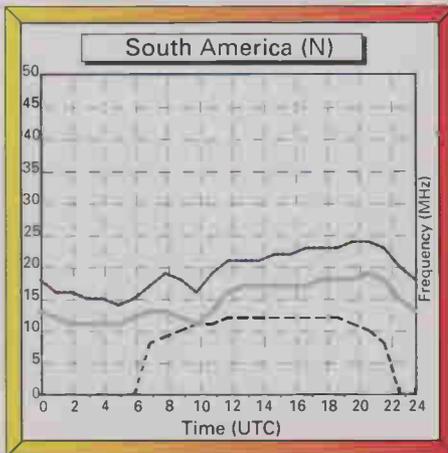
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

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.

May 2004
Circuits to London



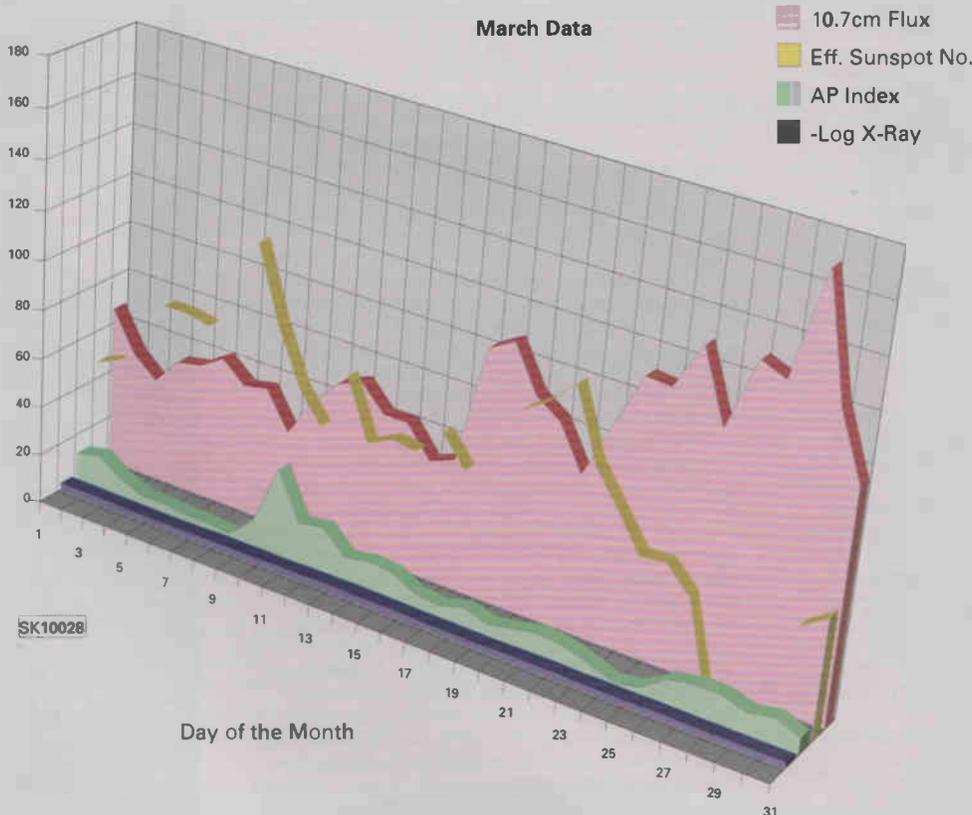
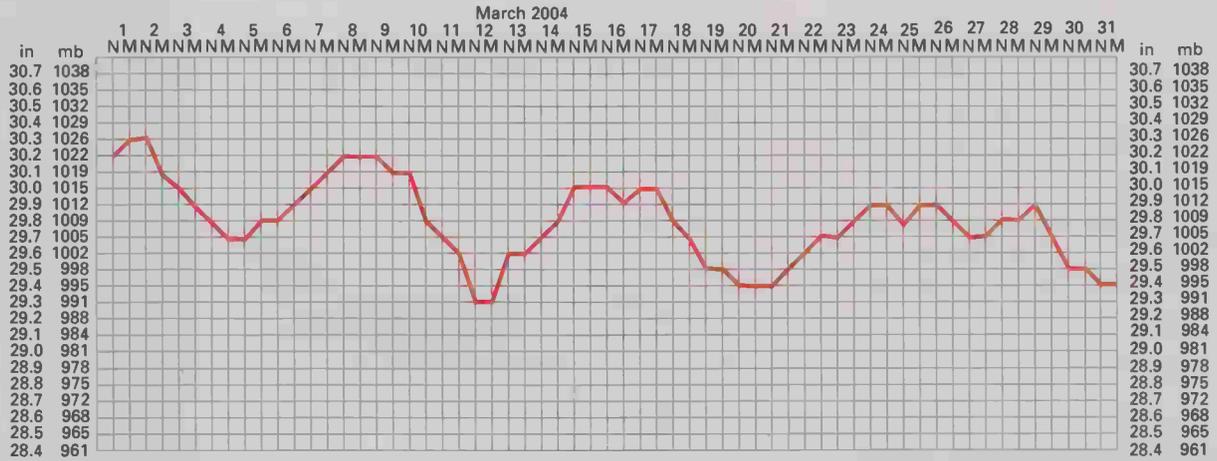
SK10027

Propagation

Extra

- **Kevin Nice** G7TZC, M3SWM,
SWM Editorial Offices, Broadstone
- **E-mail:** kevin.nice@pwwpublishing.ltd.uk

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, March 2004.



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.

Satellite

TV News

● Roger Bunney 35 Grayling Mead, Fishlake, Romsey, Hants SO51 7RU

March 8 saw a rocket attack take place on the USA military headquarters in Baghdad. Within minutes live pictures of the resulting fire and overhead helios were carried on several networks including Sky News. Two live feeds were noted - one on the APTN frequency - 10.972GHz-Vertical, (Symbol Rate 4167+ Forward Error Correction 5/6) via *Eutelsat W1*, 10°E and with a 2nd live feeder for CBS over on *Eutelsat W2*, 16°E @ 12.533GHz-Horizontal (SR5632 + FEC3/4). It's likely that ABC carried their own live feed via *Intelsat 707* @ 1°W. CBS carried their report and ended with the presenter reeling off many dozens of individual TV stations and networks in the USA which would be edited onto the respective station's news items. CBS followed with colour bars and ident 'CBS BAGHDAD MANSOUR HOTEL'.

The following evening CBS veteran Dan Rather appeared over 16°E with several 'lives' into the American networks from 2000 - 12.556GHz-H (5632+3/4) - from the Mansour Hotel. An interim constitution for the future Iraqi government of the country was signed in Baghdad this day which seems to have promoted the attack on the Rashid Hotel where delegates were staying. Dan Rather was heavily involved with the Gulf War and interviewed Saddam Hussein just prior to the last war. A couple of hours later on the 8th an extended sat transmission (again on 12.556GHz-H) featured Dan Rather interviewing the current American administrator in Baghdad in one of Saddam's former palaces, now used as a military centre. This involved a walk through the vast building featuring marble pillars and opulence. Dan, a true professional and 'on location' displays patience and understanding of the many technical problems that do occur.

Violence too has been present in the Caribbean, with a rebel uprising in Haiti leading to the fleeing of the President and the rebel forces taking control. The climax to the uprising occurred during the final days of February with live pictures out of Haiti being monitored on the 27th over *W1* - 10.961GHz-V (4167+5/6) - this being a European distribution frequency 2nd hop - these reports being updates on American and French folk leaving the country against a backdrop of Port au Prince. **Alan Richards** (Horncastle) also noted an APTN *AdHoc* feed at 12.728GHz-V (5632+3/4) this day over *W1*. Two days later and the rebels entered the city with pictures showing smoke rising, cars burning and retribution being handed out to many of the President Aristide supporters. Live pictures however were still being uplinked from the relative safety of higher ground around the Port au Prince outskirts. Two vision circuits were established over *NSS-7* @ 21.5°W - 'PACSAT-2' - 11.037GHz-H and 'PACSAT' - 11.051GHz-H (both 6109+3/4). Another satellite downlink was 'found' on a 'blind search' scan on *Intelsat 907* @ 27.5°W - 11.610GHz-H (6109+3/4) signing as 'SERVICE 1'. The 'PACSAT 2' circuit was frequently used by Sky News for inserts 'on the hour', a chance comment from the Sky News control room over the reverse talkback earpiece to the obviously over-hot reporter was that "It's snowing here in Osterley" resulted in the answer "We could sure do with some of that here!" Osterley is the London base for Sky TV.

There's considerable fear growing in the fishing villages in the Northern Fjords of Norway. Giant crabs between 600-900mm are moving southwards devouring all fish activity in their path. These giant crabs normally live their lives out in the Barents Sea, North of Murmansk, but are now on the move Southwards and have already reached the Norwegian Lofoten Islands. There's sufficient alarm for the TV2 network to set up a TV crew and sat uplink at the village. Concern of fishing folk was very real. The TV2 live feed was carried on the 28th over *W2*, 16°E @ 12.525GHz-H (5632+3/4) and service ident 'TV2 NORWAY E'.

Over 26 people died at a water park centre Valentines Day disaster on a freezing Moscow night. The weight of ice and snow on the glass roof brought the whole structure crashing down into the swimming pools and other leisure areas, exposing those beneath. Rescuers fought to clear debris from the trapped swimmers. Live pictures were fed into the European TV networks for their news services, the uplink was

fed out over *W2*, 16°E from the 'NTV RUS-2' sat truck, received @ 12.563GHz-H (5632+3/4).

Apart from the four Granada Media leased sat trucks that appear regularly over *Telecom 2D* @ 8°W with their early evening news magazine programme inserts, there is much other content to be viewed on this satellite. March 2 and a live football match Norwich City v. W Bromwich Albion was carried for Sky Sports (unscrambled!) @ 12.579GHz-H (11796+3/4). The BT truck 'BT TES 37 UKI-341' truck appeared for this sporting battle from about 1900 onwards. Interesting that the pictures prior to kick-off were in the standard 4:3 aspect ratio, cutting to 16:9 widescreen for the match, returning to 4:3 for the post match 'inquest', etc. *Telecom 2D* however, is more frequently used by the French TV services both for regional news offerings and sporting action.

There's not much life on Mars apparently though the NASA-TV press conferences are keeping folk up-to-date with the latest pictures from their rover vehicle, soil tests and other activities. *Atlantic Bird-1* @ 12.5° is the usual provider of the NASA press calls over the Globecast bouquet on 11.104GHz-H (20145+3/4) and the Mars press call of February 19 over the Channel 2 slot updated both the assembled press and TV folk with dramatic pictures and soil findings. The NASA briefings also accept 'phoned-in calls from viewers which are answered live from a panel of assembled space experts.

McDonalds is an American invention. Mid-February and a couple of USA PR management types arrived at the Garston, Leeds McDonalds restaurant. They were there to establish the differences in taste, staff presentation, customer reaction and perceptions - their findings were recorded and satellite linked back to the USA HQ via *Atlantic Bird-1* - 12.732GHz-H (5700+3/4) - courtesy 'UK1 903 GLOBECAST'. Garston staff aren't impressed with the antics of their American cousins despite one being the President of all USA outlets. **Roy Carman** (Dorking) watched proceedings unfold!

*Europe*Star-1* @ 45°E is a grossly under-utilised satellite and often a quick flick over the band reveals only the 'Teletrack' racing channel and the 12.679GHz encrypted 'SERVICE 1'. Late February and a signal at 11.672GHz-V (4996+3/4) obstinately refused to lock up - even the RSD eventually surrendered. Better luck on Sunday 22 with a corporate transmission from a South African bank at 1600. A long financial presentation with no exiting uplink identification, the service ident - 'GLOBECAST AFRICA' downlinked at 11.515GHz-V (5632+3/4). Just up the band at 11.524GHz-V (6109+3/4) at the same time a more interesting spectacle, that of a football match between Nigeria and Ghana. The sat truck company was 'TELEMEDIA TEL'. Commentary on these regional matches is often very slow/parochial, unlike the aggressive commentaries often heard with UK matches. The last couple of weeks has seen an upsurge in OBs from Portugal, 'TV1/POR 11' appeared over 10°E with a late evening pop concert - 10.980GHz-V (5632+3/4) and late February via *Hispasat*, 30°W carried 'TV1-POR 17 Enc2' at 12.614GHz-V (both feeds 5632+3/4) with a news item - heavy snow in a Portuguese park.

Pope Jean Paul recently appeared at a service for the disabled in Rome. During the service all the main lights went out whilst they sang *Ave Maria* in the light of many thousands of candles. Carried for European distribution over the UP4 downlink on *W1*, 10°E @ 10.971GHz-V (4167+5/6).

Edmund Spicer (Littlehampton) notes that the previously slotted Turkish channels TRT1,2 International that were transmitted as single carrier per channel (SCPC) on the *TurkSat-1C* 42°E European beam have now moved to a multi carrier per channel (MCPC) transmission at 11.096GHz-V (27500+3/4) and have included TRT-3 and other radio channels. When there is live football such as the recent England v. Turkey match, TRT-1 often carry the whole match in the clear and with few ads to break up the continuity of football action. With important football matches - England v. Turkey - the UK's 'Radio 5 Live' will normally carry commentary and so with the TurkSat pictures and Radio 5 commentary it's possible to enjoy sports programming in the clear.



Test card - Sudan TV - Arabsat @ 26°E.



TV2 Norway, the vertical white bar in the lower black rectangle cycles right to left! (16°E).



NASA-TV reports on Mars exploration - 12.5°W.



NASA TV logo.



More information from NASA TV.



This American ambulance kept on rolling - straight into the water! (21.5°W).



Roy Carman viewed on a very moving ceremony here's a wonderful picture of the Pope holding a flower.



Ronnie McDonalds PR guys get to work.

DX

Television

● **Keith Hamer & Garry Smith**

17 Collingham Gardens, Derby DE22 4FS

February was another disastrous month for Band I reception, being described as the worse month ever, the 'big zero' or, as one reader put it in terms of cricket, 'a duck'!

Reception Reports

Despite the bad conditions, **Peter Barber** (Coventry) did manage to spot an opening on channel R2 from 0826 on February 9 with colour bars, possibly from the Ukraine with programmes at 1006. The Ukrainian striped '1' logo was visible in the top-right until 1035.

Simon Hockenull (Bristol) reports a few Meteor-Shower pings on the scanner but they were too brief to even identify the Band I channel! Even 'tropo' was disappointing apart from a few very minor brief lifts to the main f.m. radio signals from Rowridge, Sutton Coldfield and North Hessary Tor. **Stephen Michie** (Bristol) also experienced slight lift conditions on the f.m. band on the 9, 10 and 14th, the most distant transmitters being Croydon and Crystal Palace.

Radio Reflection Detection

Andy Smith G7IZU (Plymouth) has a couple of receivers rigged up to constantly monitor 48.250MHz (Channel E2) and 55.250MHz (E3) in s.s.b. mode, listening for Meteor-Shower, Aurora and Sporadic-E signals. A simple dipole and pre-amplifier feeds the receivers, which are fed into a PC audio card. The PC is running two copies of **DL4YHF's Spectrum Lab**, which creates some 'live' FFT plots of the audio spectrum which are then uploaded every minute onto Andy's web pages.

On the main 'live' page you see an FFT plot of the previous ten minutes, plus a signal-level trace over the same period. Reflections of meteors, Sporadic-E and auroral events show up as lines or pings on the plot, only lagging real time by a minute or so. On another page there are plots created by the second FFT showing six-hour views from the past 24 hours. Anyone interested in a confirmation of Band I activity should view the website at:

www.tvcomm.pwp.blueyonder.co.uk/G7IZU_Radio_Pages/Radio

The site also has various archive capture and analysis pages.

Sporadic-E Prediction

During daylight hours, **Simon Hockenull** (Bristol) monitors the h.f. (short-wave) signals from the external service transmitters of Norway, Sweden Germany, France, Spain and Portugal on the 15,17,18 21 and 26MHz bands. Normally these signals are received via F2 backscatter mode i.e. they are weak and very

fluttery. If there is any Sporadic-E around, these signals will suddenly increase in strength to sometimes local levels with normal Sporadic-E fading characteristics.

Signals can last sometimes for many hours and favour particular directions which can vary in a similar manner to what we experience in v.h.f. Bands I and II. Simon uses this same method to great effect during the main Sporadic-E season, which acts as a good early warning system and indicates accurately which direction the openings in Bands I and II will favour.

End Of The World

BBC West recently showed an item featuring its mechanical Globe Symbol dating back to 1985. The mechanical Globe used by BBC-1 Network made a final appearance at 1735 on 18 February 1985 and was replaced by a digitally-generated Globe until 16 February 1991, when a hi-tec laser-generated version was introduced. This, in turn, was followed by a series of hot-air balloon sequences featuring a Globe which began on 4 October 1997 and ran until 29 March 2002.

Service Information

Germany: Gösta van der Linden (Netherlands) has supplied details of the digital terrestrial (DVB-T) roll-out in Germany during the course of 2004. All analogue transmitters will be taken out of service when DVB-T comes on the air. There will be no duplication period which means that analogue reception from Germany will soon be just a happy memory! Here are the depression details:-

Digital services commencing 24 May 2004:-

Region: Köln/Bonn

Starting with 16 programmes, the digital multiplex signals are on the following channels: E26, E29, E36, E43, E49, E65 and E66. Eight additional programmes will follow on 8 November 2004. Transmitters are Köln-Colonius and Bonn-Venusberg; The senders e.r.p.s are not known at the moment.

Region: Hannover/Braunschweig

Starting with 16 programmes, the channels are: E8, E23, E24, E28, E31, E36, E44 and E60. Eight additional programmes will also follow on 8 November 2004. The transmitters are Hannover (20kW), H. Henningen (5kW), Braunschweig (5kW) and BS-Kraftwerk (2kW).

Region: Bremen/Unterweser

Starting with 16 programmes, the channels are: E22, E29, E32, E42, E49 and E55. Eight additional programmes will follow on 8 November 2004. The transmitters are: Bremen (20kW), Steinkimmen (5kW) and Schiffdorf (5kW).

Digital services commencing 8 November 2004:-

Region: Düsseldorf/Ruhrgebiet

Starting with eight programmes, the channels are: E9, E25, E29, E35, E39, E48, E52, E53, E55, E59, E64 and E66. 16 additional channels will follow on 4 April 2005. Transmitters and e.r.p.s are not known at the moment.

Region: Hamburg/Lübeck

Starting with 24 programmes, the channels are: E9, E23, E28, E30, E33, E40, E46, E52, E53, E56 and E59. Transmitters are: Hamburg-1 (50kW), Hamburg-2 (10kW), Berkenthin (20kW) and Lübeck (10kW).

Region: Kiel

Starting with 16 programmes, the channels are: E21, E24, E26, E35, E45, E50 and E55. Alternative channels are: E5, E36 and E39. Eight additional programmes will follow on 8 May 2005. There is only one transmitter: Kiel (20kW).

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 discs and good-quality video recordings.

Our DXTV and Archive TV website can be visited at www.test-cards.fsnet.co.uk via the Internet.



● The last mechanical BBC-1 West Globe Symbol.



● The digitally-generated Globe first appeared at 1900 on 18 February 1985.



● The laser-generated BBC-1 Globe was transmitted from 16 February 1991.

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 and good-quality video recordings.

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February snow in Britain, America and Greece, March Sahara dust over the Atlantic and Indian ocean cyclones have all featured in images received from the satellites. Although I confess to having appreciated a few long, clear dark nights in February that allowed me to test my new telescope system, trampling through light snow in the garden at 0200 is not pleasant. The fascinating part was seeing snow and frost covered Britain under clear skies.

heavy I was struggling to see to the end of my garden. Yet through all this my signal quality did not appear to fall below 78%, with no segment loss (usually 93% - 99% on clear conditions). I was very impressed just how well the system stood up to these conditions, which I am very unlikely to see again in these parts".

George Newport and **Kevin Hughes** both contributed daylight images from *NOAA-17*. George commented on the improved daylight

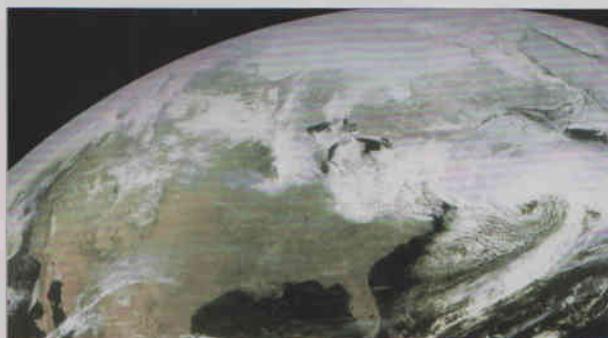


Fig. 1: *GOES-12* 8 March 1800 the snowy wastes via *METEOSAT-8* © EUMETSAT 2004.

Reports of heavy snowfall came from North America and some weather satellite (WXSAT) monitors posted pictures of the snow near the west coast. While looking at the British landscape as imaged by *METEOSAT-8*, I remembered that the Foreign Satellite Data relay was also available and included pictures from *GOES-12*. From its position over the equator above the American east coast, *GOES-12* still has a commanding view of high latitudes. **Figure 1** shows an early evening visible-light image from *GOES-12*.

The region between the coast of north-eastern America and Greenland used to be seen on most days from the old Russian WXSAT *METEOR 3-5* because its higher orbit allowed a greater range for monitoring. Since its demise, I have no longer been able to view this region from a polar WXSAT - but *METEOSAT-8* (through *HotBird-6*) has given us both *GOES* WXSATs.

Late February brought more snow to Britain. **Ian Deans** commented "Here in Monifieth, (10km north of Dundee for our foreign friends down south), we had some of the heaviest snow I have seen in my 18 years living here. At one point my LNB (low noise block) was completely covered in snow, including the feedhorn - the snow was so

illumination that helps the signal processing software (see my notes about *WXtoImg*) to produce enhanced coloured images - see **Fig. 3**. Kevin's images show the frozen lands of Scandinavia and approaching weather systems - see **Fig. 4** (and also **Fig. 11**).

METEOSAT-8 also showed a huge amount of sand being blown off the Sahara desert into the Atlantic during early March. Once offshore it seemed to get caught up in

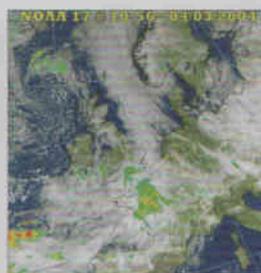


Fig. 3: *NOAA-17* 4 March from **George Newport**.



Fig. 2: *NOAA-16* 1339 1 March high resolution image showing snow fields in Scotland and Wales.

an Atlantic wind stream and was carried northwards, still off the coast of Spain.

The false-colour composite image, **Fig. 6**, from *METEOSAT-5* was acquired 6 March at 1230 by **David Taylor**. It shows tropical cyclone *Gafilo* approaching Madagascar. David used his *GeoSatSignal* program for image enhancement. To see this cyclone in perspective, and the whole-disc scan produced by *METEOSAT-5*, I am including **Fig. 7**.

Peter Schoen of Germany pointed out an unusual event that occurred during February in the Aegean Sea. Ice and snow hit Greece and the adjacent islands. He recorded an image showing snow-covered regions around the capital of Athens. It was later reported that snowfall had reached the Middle East.

Meteorologist's Experiment

The reception of high resolution picture telemetry (h.r.p.t.) images from the NOAA WXSATs remains at the top end of satellite imaging. Unlike reception of *METEOSAT-7* Primary Data, recently superseded by *METEOSAT-8* HRIT (high rate information transmission), the equipment for h.r.p.t., whilst still expensive, is at least physically manageable. Equipment variations are mostly limited to dish size.

Patrick Prokop is a meteorologist with WTOC-TV in America and he sent me some notes about dish size comparisons that he made using his Timestep h.r.p.t. reception system. Although h.r.p.t. remains a minority interest because of its cost, I am sure readers would be interested to know about his tests. Patrick was experimenting with two different sizes of perforated parabolic dishes - and the result: bigger is definitely better.

Patrick started with the Timestep 0.9m dish and 20m of the supplied coax cable, their LNA (low noise amplifier), receiver, interface and *WinHRPT* software. Located at his home, the initial results were poor reception, due in large part to the many trees near his house. Patrick then moved the entire system to the TV station where he works and which has a much better field of view.

As could be anticipated, station management wanted to change to the 'Professional' system, so he upgraded to the 1.5m dish and heavy duty dish rotator, Emotator 800. The coaxial cable had to be increased to 40m. The result was somewhat better reception, data was received when the stronger signals were about 10° elevation above the horizon. The station has a tall, steel relay tower and their own 70m Doppler radar tower was nearby, always causing dropouts.

Patrick was aware that many users with 0.9m dishes enjoyed better reception than his results with the 1.5m dish, so he removed the larger dish and re-installed his smaller 0.9m dish, but this time added the Timestep line amplifier obtained from Spectrum International, at the LNA. With this addition, 0.9m dish reception was as good, if not better than the 1.5m dish without the line amplifier. "With this configuration, I was able to receive the data signal when the stronger satellites were around 12° to 15° above the horizon.

(Keep in mind, I do have several trees a few hundred metres away in all directions and a horizon reception is really not feasible at my location. I was happy with 12°).

A month later, Patrick's station engineer took off the 0.9m dish and re-installed the 1.5m dish. Patrick re-positioned the line amplifier and found that the result was much better. Reception now starts at about 3° elevation and there is an improvement around the tall towers, resulting in a very clean signal. Patrick comments "I am a meteorologist looking for high resolution imagery of the weather around me and have found it". Visit www.savannah-weather.com



Fig. 4: NOAA-17 8 March 1103 from Kevin Hughes.

Encryption Delayed

My EUMETSAT Key Unit (otherwise known as the dongle) arrived in late February. The instructions for installation were easy to follow and reminded me that I had not installed the new software issued a few weeks earlier. After much searching amongst my CD-ROMs, I eventually found it still in its package, between some weather satellite magazines! The process of software and dongle installation was completed within about 30 minutes (so who is in a hurry?) and everything worked fine. The CD also contains essential software for using the dongle.

With no obvious problems, I wondered whether the data stream was actually going through the dongle, so I posted a query about this. Arne van Belle kindly contacted me to explain how this could be checked. He has also written a document about dongle installation and this is available via the (rig-l) WXSAT newsgroup.

After installing the dongle (and the new software) I have experienced a considerable improvement in image quality - with no more lost segments. These regularly spoiled many of the images - my efforts to locate the cause did not find any specific reason.

Meanwhile, because of delays in issuing software and dongles to all those registered with EUMETSAT, a decision was taken to delay encryption: "On 2 March 2004, EUMETSAT had intended to introduce full

EUMETCast Key Unit (EKU) encryption for licensed SEVIRI data (15, 30, 60 and 180 minute repeat cycles). However, due to the considerable number of Users who have been licensed to receive services but have yet to receive their EKU, we have decided to postpone the introduction of full EKU encryption until mid-April 2004.

We strongly encourage all those Users who have received their data access licence, but have yet to return a signed copy to their Licensing Agent to do so as quickly as possible. Failure to do so could result in the loss of data in mid April 2004. Likewise, those Users who have still to pay for their

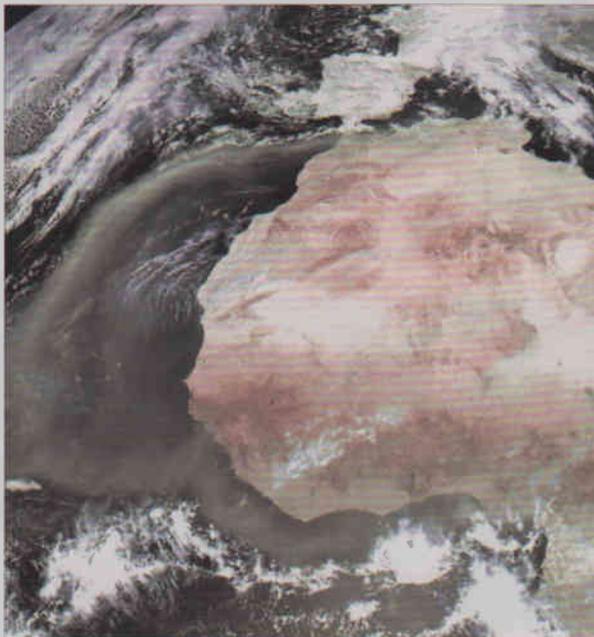


Fig. 5: Sahara dust over the Atlantic on 6 March 1200 from METEOSAT-8 © EUMETSAT 2004.

EKU are encouraged to do so to avoid unnecessary loss of data when the EKU encryption is introduced".

We have been grateful to EUMETSAT for this delay, it has enabled many users to avoid missing any data.

Using WXtoimg

About ten years ago the idea of decoding recorded sound files from the WXSATs was introduced. The novel idea was that sound files - usually in 'wav' format - could be produced by recording the 'tick-tock' (demodulated) audio output from a WXSAT receiver using a soundcard. This eliminated the cost of buying a hardware decoder, whilst adding the possibility of extra signal processing facilities.

As soundcards became cheaper, this method of WXSAT decoding gained in

popularity, I regularly receive such images from correspondents. As far as I recall, the first program available to record the 2.4kHz audio signal from WXSATs was *wxsat*, a program that recorded the signal and would then process it at the end of the pass.

Two much-enhanced programs were written - *SatSignal* by David Taylor of Edinburgh and *WXtoimg* by Craig Anderson of Abstract Technologies, New Zealand. Following several suggestions from readers, this short review looks at Craig's program. I had planned an earlier look, but another contributor published his notes first! I still plan to write a full review.



Fig. 6: Tropical cyclone Gafilo from David Taylor - METEOSAT-5 data © Eumetsat 2004.

WXtoimg Basics

The software version that I am using is v2.5.9 and is a fully automated WXSAT recording, decoding, editing and viewing program. I am currently using it at a basic (unregistered) level for automatic recording and decoding because this is probably the manner in which most users will try it first, before considering registering. The program can be downloaded from www.wxtoimg.com

Installation of the software is simple: you can be up and running within a few minutes. I do recommend a careful study of the extensive help file because *WXtoimg* can do so much more when it has been set-up and configured correctly. Before that, though, you can easily leave it to record several passes automatically and watch it decode in realtime - giving you live images during reception.

WXtoimg supports both a.p.t. (from polar orbiting satellites) and WEFAX from geostationary satellites, though with WEFAX rapidly losing market share (due to METEOSAT-8), I have only used it for monitoring NOAA WXSATs. *WXtoimg* has a built in set of image processing

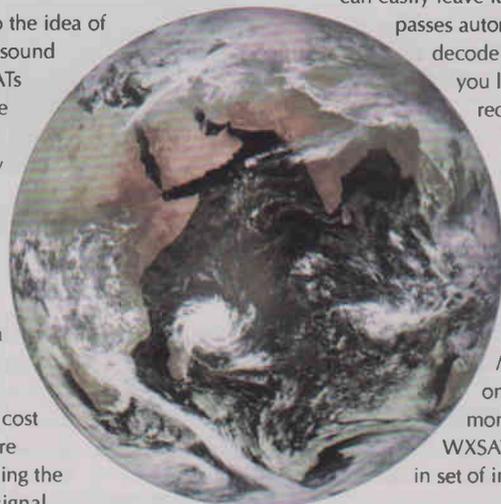


Fig. 7: METEOSAT-5 image showing Gafilo and countries at 0900 on 6 March © EUMETSAT 2004.



Fig. 8: NOAA-12 15 February showing Greek islands under snow - from Peter Schoen.

facilities, but can output raw images for further processing in JPEG and all the main formats.

WXtoImg supports map overlays, advanced colour enhancements, 3-D images, animations, multi-pass images, projection transformation (such as Mercator), text overlays, automated webpage creation, temperature display and control for many weather satellite and communications receivers and scanners. Most non-WXSAT receivers have bandwidths that are too narrow for proper signal decoding but the software attempts to produce reasonable images anyway, although there are limitations to its effectiveness.

The program uses the data on NOAA a.p.t. signals for accurate calibration and corrects for non-linearities in signal strength, as well as making adjustments for gain changes during the pass. The telemetry data is also used for instrument calibration to provide accurate temperature readings, including temperature calibration on infra-red images.

On other satellites, the greyscale and black and white bars are used to adjust the gain. *WXtoImg* uses a PLL (phase-lock loop) technique to correct for Doppler shift and ensure straight images on NOAA satellites even in the presence of high noise levels or poor signal quality. My first pass produced a slanted image, so I followed the instructions (takes one minute) and every subsequent pass has been perfectly synchronised.

Several types of image can be produced from each pass, this is because of the ability to customise data from the visible and infra-red channels. The multi-spectral analysis (msa) format uses the NOAA channel 2 - 4 images and determines which regions are most likely to be cloud, land, or sea, based on its analysis of these images. A vivid false-coloured image is produced by this analysis. The options menu provides choices to adjust the colouring of these images.

One variation enables the colouring of high, cold cloud tops to give an indication of the probability and intensity of precipitation. A further option in the upgraded version produces a 3-dimensional image that is viewed with blue-green glasses.

The above notes include only a small sample of the facilities offered by the



Fig. 9: NOAA-16 10 March from Patrick Prokop, showing snow in north America.

program. I have been using it to decode NOAA a.p.t. for a few weeks and have been impressed with several of its features. The easy update of Kepler elements direct from the Internet is very good - one click to download from the Celestrak site. We have come a long way since those early days of sound-file decoding!

Finally, Fig. 11 shows the frozen lakes



Fig. 10: NOAA-17 13 March 1051 a.p.t. image processed by *WXtoImg* in m.s.a. format.

and rivers of Scandinavia in March - imaged by NOAA-16.

Credits: All METEOSAT images are © EUMETSAT. All NOAA images are courtesy NOAA (USA National Oceanic and Atmospheric Administration).

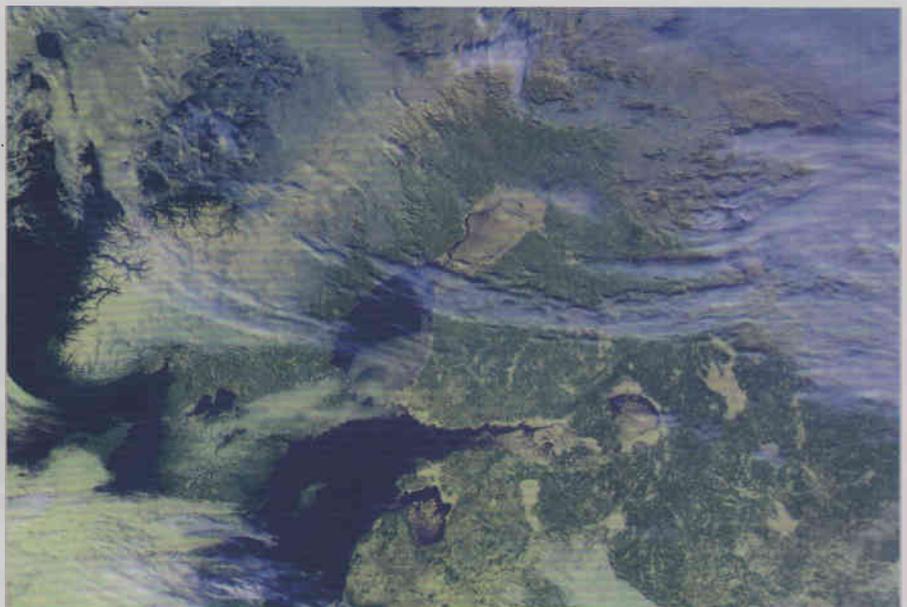


Fig. 11: NOAA-16 1157 on 10 March high resolution image.

Frequencies

a.p.t.

NOAA-12 and NOAA-15 transmit a.p.t. on 137.50MHz.

NOAA-17 transmit a.p.t. on 137.62MHz.

During overlap periods, NOAA-12 or NOAA-15 may be switched off.

h.r.p.t.

NOAA-12 and NOAA-16 transmit h.r.p.t. on 1698.0MHz.

NOAA-14 and NOAA-17 transmit on 1707MHz.

NOAA-15 transmits on 1702.5MHz.

FENGYUN-1C and -1D transmit on 1700.5MHz.

WEFAX: METEOSAT-7 (geostationary) transmits WEFAX on 1691 and 1694.5MHz and Primary Data on 1691.0MHz.

HRIT-LRIT and FSD (from METEOSAT-8) are transmitted by *HotBird-6* on 11.096GHz.

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Several times a year the north west coast of Scotland is host to an event known as the Joint Maritime Course (JMC). Involving the armed forces of NATO and other supposedly 'friendly' countries the event generally runs for two weeks.

The first seven days encompass the 'run up' with the last week providing more interesting monitoring. Although much of the traffic between aircraft and vessels is encountered on v.h.f. and u.h.f., the h.f. bands certainly provide interesting transmissions for those listeners not near enough to the action to monitor the higher frequencies.

The forces involved stress that this is a 'course' and not an exercise. For example, a submarine engaged on exercise may attempt to remain undetected in order to complete its task. On the course the submarine will be locatable in order to afford all assets involved in the opportunity to practice operational integration.

Surface vessels can be heard communicating with air assets and the E-3A AWACS aircraft (callsign MAGIC). The AWACS act as airborne control aircraft.

I recently managed a pint with Nick from Derbyshire who explained some callsign theory to me. Some of it is obscure, for instance the callsign MAGIC is so named because the E-3A AWACS possesses a large dish on the top reminiscent of a mushroom...q.e.d. MAGIC Mushroom.

The Course generally involves two opposing forces identified as CYAN and MUSTARDIAN. Conversational sparring on u.h.f. between the two is sometimes carried out in affected European type accents. The h.f. comms tend to be more staid but for the avid listener, no less interesting.

The JMCs always follow the same format with onshore briefings over the first weekend followed by a five day 'working up' phase. The middle weekend is a period of increasing tension between the CYAN and MUSTARDIAN forces. The four day combat phase starts at dawn on the second Monday until the Thursday evening as the fleet makes its way south from the north west of Scotland. Things start to get quieter by Wednesday evening, especially if the weather isn't too good. The second Friday is debriefing day and then the fleet have a run ashore in Garelochhead and Helensborough.

This year's remaining courses are JMC 042 from 21 June to 1 July and JMC 043 from 25 October until 4 November. Listen on the following frequencies and you will hear some JMC traffic.

2.657, 3.394, 4.0905, 4.484, 4.706, 4.718, 4.724, 4.745, 4.782, 4.844, 5.092, 5.178, 5.180, 5.270, 5.2725, 5.310, 5.336, 5.417, 5.420, 5.693, 5.702, 6.694, 6.715, 6.830 and 9.031MHz.

Further North

The arctic regions have long been a source of fascination for many people. Adventurers, prospectors, miners and trappers have traditionally travelled these regions and since World War II the frozen north has become home to many military units.

There are still many who are drawn to the remote region and generally these people are not technically competent, neither are they interested in digital communications. They need to talk to their neighbour, base camp, office or home and they don't need to mess around with computers.

In any case the cold weather is a particularly hostile environment to operate sophisticated equipment. Single side-band h.f.



radio is still the preferred mode of communication for many people operating in the Canadian and American northlands.

Many US marketed h.f. sets have the State of Alaska Emergency channel installed as standard. One of the foremost manufacturers of portable h.f. radio equipment specifically designed and manufactured for this harsh environment is **ParaComm Technologies Inc., Winfield, British Columbia, Canada**. They offer two basic h.f. radios and carry systems specifically designed for the purpose. Both sets operate between 2-8MHz and have six pre-programmed channels available and fulfils the needs of the majority of users in the Northlands.

The PCX-250 and the PCX-250EX are designed to withstand high levels of physical and electronic abuse and will operate at temperatures as low as -40°C (or -40°F, both measurement systems coincide at this temperature), as well as at high temperatures and humidity levels. Both units are supplied with an extended temperature microphone and a ballistic high visibility nylon carry pack.

The PCX-250 is capable of 20W output and the PCX-250EX will run 10W. These radios are designed to work with low height/poor antennas

and the 250EX is especially configured in this regard. They run on D-cells and industrial alkaline batteries are recommended. Power consumption on receive typically is only 30-35mA and battery life is measured in hundreds of hours.

These sets are the ultimate rugged portables designed for civilian and military use. The PCX-250EX can also be configured to give up to 750mW of audio from the built-in speaker but at a slight cost in power consumption.

The Canadian military are good customers of ParaComm. Forestry and Fish and Wildlife Officers also utilise the PCX-250 series sets, as do Inuit communities in the far north who still pursue a traditional lifestyle of trapping and hunting. Most of the PCX-250 radios are sold to First Nations Canadians.

Research and frequencies used by travellers' frequencies in Northern Canada/Baffin Island include: 4.5540, 4.54725 and 4.4410MHz. The

Alaska State Emergency frequency (monitored by Police agencies and other official bodies) is 5.1675MHz.

Other Canadian north and Alaskan bush frequencies in use are 3.201, 4.025, 5.1645, 6.948, 5.1345 and 5.2075MHz. Two Alaska marine comms channels are 6218.6 and

4125kHz (the most widely used marine channel in the state). All communications on these frequencies are generally u.s.b. A general search between 4.400 and 4.550MHz and from 5.200 to 5.225MHz will reveal the other users in the Canadian Arctic. Thanks to **John Roberts** of ParaComm Technologies for information on the PCX-250 series.

UK 5MHz Operation

In the UK holders of full (or general) class amateur licences can apply for permission to operate on five selected frequencies in the 5MHz area, where they are permitted to contact military stations. Comprehensive log keeping and signal reporting is required and logs must be submitted to the RSGB for collation. It's notable though that communications must be in u.s.b. mode.

Much military h.f. equipment may not be easily configured to operate in I.s.b., which is conventionally used by amateur operators at frequencies below 10MHz. The whole exercise is being carried out to evaluate the feasibility and effectiveness of h.f. communications throughout the UK should a major terrorist incident, or disaster, occur. In this event it's possible that, as in the frozen north, the NVIS effect could be a particularly useful tool.

The frequencies in use are 5.2585, 5.2785, 5.2885, 5.3985 and 5.4035MHz. Activity is generally high on Sundays and Thursday afternoons when schools that have Combined Cadet Force (CCF) signal sections come on air. The CCF stations are allocated some frequencies slightly lower than those listed above.

The channels are given the following designators FA, FB, FC, FE and FM respectively. The military stations use callsigns such as Five Charlie or similar and are not supposed to state their location.

● **Peter Bond** 110 Editorial Offices
Broadstone

● **E-mail** skyhigh@pwpublishing.ltd.uk

The past two years and especially the past year has seen the most comprehensive series of Airspace changes in the UK for many years. The most recent changes on the

18 March were no exception with the AIRAC, the document, which amends the UK Air Pilot running to some 253 pages. (I'm glad that it wasn't my job to sit in an operations office and do the AIP page amendments). The UK Airways and Reporting Point structure is now almost unrecognisable from that of two years ago. Many of the long standing Airways have been renamed with many Reporting Points becoming supposedly meaningless five letter names rather than recognisable places.

Following on from my column of the past two months here are some further information on the airspace changes. As previously reported the only frequency change prior to the 18 March was to London TC, (Terminal Control), with 123.9 having replaced 121.225 for Lambourne arrivals and departures. On the 18 March 121.225 re-appeared along with 121.025 were both introduced on the revised Clacton Sector as what I interpret as TC/REDFA/LOGAN. The published information also lists the frequencies 124.925 and 129.6 as being introduced as part of the March changes, but as far as I am aware they have been in use with London TC for some time.

It is interesting to note that although the major junction on TACAN ROUTE 1 was moved north from Mildenhall to Marham (MAM), last Autumn, aircraft continued to use the Mildenhall TACAN as a reporting point. This changed on the 1 February when the route via MAM was brought into operation. Prior to this, some aircraft had been asking for direct routes between reporting points to cut corners rather than stick to the TACAN route, but this practice seems to have ceased as soon as the new airway UP155 became operational.

Warton/Coningsby

I am grateful to **Matt** who lives in Blackpool, he recently came up with the following information after a trip to Warton to watch the Typhoons fly. He says, "You don't see many reports from Warton, so I thought I would drop you a line. During my visit I was fortunate to see three Typhoons fly, they were using the callsigns, MONKEY 1/2/3. Whilst I was there I confirmed the following

two operations frequencies in use, 342.2 BOFFIN Ops Stud 5 and 344.5 Operations Stud 7. It appeared that 344.5 was also used as an Air-to-Air frequency as well as an Air/Ground Operations frequency. I also noted what I believe to be a new frequency, which was 242.1, it appeared to be used primarily as a 17 OEU Squadron Air-to-Air but they also called an AWACS on this frequency". Thanks Matt, I can confirm that MONKEY is a new callsign that has been used by 17 OEU Squadron, first noted in late January 2004.

A second report on the same flight from an anonymous reader indicates that the MONKEY flight operated with an AWACS, callsign MAGIC 68 on an AWACS primary frequency 263.45/TAD 501. The report also mentions that information on the status of the MONKEY flight was passed to NATO 18 on the London Military frequency 275.475. This is the first report I have seen of the Typhoons engaging in tactical operations with the AWACS and indicates that they are now well into their evaluation training. I am assuming that they were Coningsby crews flying out of Warton with the Operational Evaluation Unit (OEU), so hopefully we will at last see the Typhoon fully operational at Coningsby in the not too distant future.

Following on from this, **Brian L** asks, 'With the imminent arrival of aircraft from 17 OEU Squadron this year, do any of your readers have an up-to-date stud list for the frequencies at Coningsby, (that include any changes made since the departure of 56(R) Squadron to Leuchars)? I did a quick search on the Internet for up-to-date information but with no luck - any offers anyone?'

Fairford

The 100th ARW are now resident at Fairford with regular missions being flown. Air/Ground operations are being conducted on frequency 249.75, (Fairford Ops). This was originally the C-130 Bravo Rotation operations frequency at Mildenhall, when the Bravo rotations ceased it appears to have been used as an ACC standby frequency, with KC-135s occasionally being heard to call it as Bravo Ops. It was used by both Mildenhall and Fairford during Operation Iraqi Freedom last year and it appears to be available for use at both airfields. Since their arrival at Fairford, also reported in use on several occasions has also been the 100th ARW 'BULLPEN' air-to-air frequency

379.075.

On the 27 February, I picked up QUID 52 descending into Fairford. He called Fairford Ops on 249.75 and reported that after air-to-air re-fuelling his boom would not lock up in place. He asked for a 'phone patch to 'RED BARON' to discuss his hydraulic problem. By the time they had sorted out the 'phone patch he had unfortunately descended too far for me to pick up a legible conversation. (I am 225km from Fairford). Did anyone hear the outcome of the incident, I am intrigued to find out?

RIAT 2004

A subject that has appeared prominently in my postbox in the past two years has been the Royal International Air Tattoo at RAF Fairford - sadly, not always for the right reasons. The problems with traffic queues, access, car parking, security, etc., since September 11 have been well documented and that was without the moans about aircraft participation.

The first arrivals day being moved to Tuesday last year appears to have been a bit of a flop with numbers in Park and View being very sparse compared with previous years. As someone commented, £15 to watch around 20 current military aircraft arrive is a bit steep. (It's back to Wednesday for the first arrivals day this year).

The 2003 theme of 100 years of flight, whilst providing some interesting items, did cause concern amongst many enthusiasts as it was 80 plus parking spaces, which would normally be taken up by modern military rather than vintage aircraft. This is a fair comment as it is meant to be the world's leading military airshow.

With these points in mind, it was therefore interesting to get two similar letters during early March as most of my RIAT post usually arrives after the event. **Don** writes, "Living in northern Scotland it is a very long trek for me to get to the RIAT, nevertheless a friend and I made the 1000km drive to Fairford in 2003 only to be rather disappointed". (Don then goes on at length to detail the problems I mentioned above, especially the military aircraft participation).

Don also points out that last year including FRIAT membership, Bed & Breakfast, petrol, food, etc, the seven days away from home cost him well over £300. His closing comment is, "Very simply, I want to ask your advice. As a military enthusiast is it really worth me making the long and expensive journey to RIAT 2004?".



As we have mentioned the RIAT - this month's picture is from a classic year and a year of almost unbroken sunshine, 1989. Seen landing on the Wednesday is a very smart Royal New Zealand Air Force P-3 Orion.

Well, a leading question Don and to be honest, one that only you can answer. Despite the problems of recent years it would still be fair to say that an average RIAT is still much better than most other Air Shows. Whilst many have moaned about recent shows, (including me), it can't be easy to organise such a large event whilst considering the security and other implications. The important thing is that we don't start cancelling airshows because of the possibility of something happening, otherwise the extremists will have won.

At this early stage there is already good support from the USA for RIAT 2004, so that bodes well for the future. The themes this year such as Fighter 04, 50 years of the Hercules and 30 years of the Hawk look as though they will get the military movements flowing in. The March 12 participants listing, already lists some interesting items such as five Finnish Hawks, a Swiss F/A-18 and - interestingly - four US Navy F-18s from VFA-106 at Oceana. (Unusual for the RIAT to confirm something like USN aircraft so early in the day). There are also a couple of participants from Eastern Europe and a

smattering of interesting C-130s for the 50th anniversary so hopefully as we get nearer to the show the overall list will blossom suitably.

So my answer is Don, early indications are that it should develop into a good show, so if I was you I would make the effort to go. Have a regular look at www.airtattoo.com/AirTattoo for further aircraft participation information but don't forget the list can change due to operational requirements. *Don't miss the opportunity to try and win a pair of tickets in our RIAT 2004 competition on page 28. - Ed.*

Alpha Status

An E-mail from a new reader who lives near Cambridge, asks if I know what is the literal meaning of the maintenance codes used by USAF aircraft inbound to Mildenhall, when they call up on the Operations frequencies. I am sure many readers will have heard aircraft calling in their Alpha status plus a number of 'write-ups', i.e. any problems with the aircraft's serviceability.

After speaking to a few people, I believe

that the break down is as follows: ALPHA 1 The aircraft is full mission capable, ALPHA 2 The aircraft has some minor problems, (listed as write-ups), but is still mission capable, ALPHA 3 The aircraft is non mission capable, no further flights until repair work is completed.

The same reader also asks about the codes used for on board VIPs also by aircraft into Mildenhall, DV (Distinguished Visitor), Code 3, Code 6, etc. The official listing for each code is quite extensive and much too detailed to list here but includes both Civil and Military VIPs from all the armed forces.

To give you an idea here are some examples: DV Code 1 is the US President and Foreign Heads of State, Code 2 is the Vice President or the Secretary of the Air Force. Code 3 is Commander in Chief of major commands, such as Air Combat Command or 4 star generals. Code 4 is a 3 star Vice Admiral. Code 5 is Major Generals or Senior Rear Admirals, Code 6 is Brigadier Generals, Code 7 is Naval Captains or USAF Colonels and Code 8 is Senior enlisted personnel. Thanks to **Simon** and **John P.**

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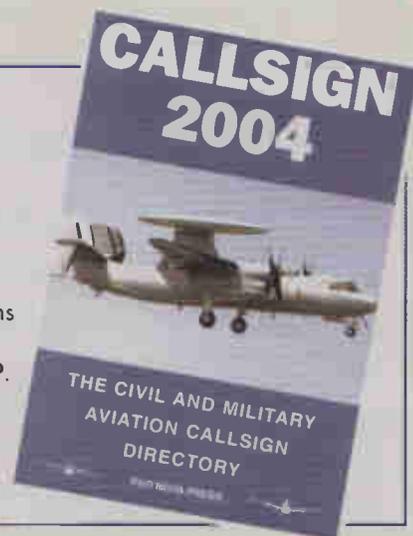
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HALTON RADIO CLUB, MOBZ. Meets at the Play Centre, Norton Hall, Windmill Hill, Runcorn. Details from Alan Parker 2E1DSF. Tel: (01928) 790228.

MACCLESFIELD WIRELESS SOCIETY, G4MWS. Meets at the Pack Horse Bowling Club, Abbey Road, Macclesfield. Details from Mrs Hazel Parrott.

MID CHESHIRE ARS, G3ZTT. Meets at the Cotebrook Village Hall, Cotebrook Nr. Tarporley, Cheshire. Details from Niall Reilly G0VOK.

NORTH CHESHIRE RC, G0BAA. Meets at the Morley Green Club, Moberley Road, Wilmslow, Cheshire. Details from Jill Gourley G0OZJ. Tel: 0161-485 5036.

RADIO OFFICERS ARS, MOROA. Details from Mr J. Bell G0CMM.

UKFM GROUP WESTERN, G83MP. Meets at the Morley Green Club, Moberley Road, Wilmslow, Cheshire. Details from Gordon Adams G3LEQ. Tel: (01565) 652652, FAX: (01565) 634560.

WARRINGTON & DARS, G0WRs. Meets at the Grappenhall Community Centre, Bellhouse Lane, Grappenhall, Warrington, Cheshire. Details from John Riley G0RPG. Tel: (01925) 762722.

WIDNES & RUNCORN ARC, G0FWR. Meets at the Scout Hut, Castle Road, Halton Castle, Runcorn, Cheshire. Details from Martin Trust G4LUQ. Tel: (01928) 714843.

CUMBERIA

EDEN VALLEY RS, G0ANT. Meets at the BBC Club, Penrith. Details from John Rowe G0VMP. Tel: (01931) 716421.

FURNES ARS, G4ARF. Meets at the Farmers Arms Hotel, Newton-in-Furness. Details from Mr K. Moore M1BWA. Tel: (01229) 466691.

WHITEHAVEN ARC, MOBEE. Details from Mr N. Williams M0CRM.

GREATER MANCHESTER

BURY RS, G3BRs. Meets at the Mosses Centre, Cecil Street, Bury, Lancs BL9 0SB. Details from Steve Gilbert G30AG. Tel: 0161-881 1850.

DOUGLAS VALLEY ARS, G3BPX. Meets at the Wigan Sea Cadet HQ, Training Ship Sceptre, Brookhouse Terrace, off Warrington Lane, Wigan. Details from Mr D. Snape G4WVG. Tel: (01942) 211397.

ECCLES & DARS, G3GX. Meets at the Eccles Liberal Club, Wellington Road, Eccles, Manchester. Details from Chns Harrison G8KRG. Tel: 0161-773 7899.

THE MANCHESTER WIRELESS SOCIETY, G5MS. Meets at the Simpson Memorial Community Hall, Moston Lane, Moston, Manchester. Details from Ian MOIPR. Tel: 0161-288 730 or visit www.g5ms.com

OLDHAM ARC, G4ORC, G1ORC. Meets at the Royston Air Training Corps, Park Lane, Royston, Oldham. Details from Michael Crossley M1CVL. Tel: (01706) 367454.

OULDER HILLS ARS, G0UQA. Meets at the Oulder Community School, Hudsons Walk, Oulder Hill, Rochdale. Details from Carolyn Hope G7WFF. Tel: (01706) 522687.

ROCHDALE & DARS (RADARS), G0RDC. Meets at the Barnfield & Fieldhouse, Cricket Club, Barnfield Village. Details from John Cannell G70AJ. Tel: (01706) 376204.

SOUTH MANCHESTER RAD & COMP CL, G3FVA. Meets at the Sale Cricket Club, Dove Road, Sale, Cheshire. Details from Chns Ward G4HON. Tel: 0161-483 5174.

STOCKPORT RS, G6UQ, G8SRs. Meets at the T.S. Hawkins, Stockport Sea Cadets HQ, Pearnill Ind. Est., Stockport Road, West Heath, Lower Breckbury, Stockport. Details from David Simcock M1JANT. Tel: 0161-456 7832.

TRAFFORD ARC, G0TRC, G1TRC. Meets at the Watch House, Cruising Club, Canal Bank, Stretford, Manchester M32 8WE. Details from Roger May G4YLQ. Tel: (01457) 866657.

TRAFFORD RADIO GROUP, G0TRG. Meets at 17th Stretford Scouts HQ, Barton Road, Stretford, Manchester. Details from Jon Mossman G7MJK. Tel: 0161-865 5609.

WEST MANCHESTER RC, G4MWC. Meets at the Astley & Tyldesley Miners Welfare Club, Measny Road, Astley, Tyldesley, Manchester. Details from Jeffrey Moran M0BGU. Tel: (01204) 497694.

WIGAN & DARC, G0HRW. Details from Mr D.H. Barkley G0DPI. Tel: (01942) 237162.

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ISLE OF MAN ARS, G03PLH. Meets in the Sea Cadets Hall, Tromode Road, Tromode, Douglas. Details from Dave Walton M0DBX. Tel: (01624) 816308.

LANCASHIRE

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MORECAMBE BAY ARS, G4VBS. Meets at the Trimpell Sports & Social Club, Outrims Lane, Morecambe, Lancs. Details from Brian Watson G0RDH. Tel: (01524) 424522.

PRESTON ARS, G3KUE. Meets at the Lonsdale Club, Fulwood Hall Lane, Fulwood, Preston. Details from Enc Eastwood G1WCQ. Tel: (01772) 696708.

ROLLS-ROYCE ARC, G3RR. Meets at the Club Room, Rolls-Royce Sports Ground, Barnoldswick. Details from Mr J.A. York G3KJY.

ROSSENDALE ARS, G1RRS. Meets at the Old Fire Station, Moxborough Road, Rawtenstall, Rossendale, Lancs BB4 8EW. Details from Ken Slaughter. Tel: (01706) 830306.

THORNTON CLEVELYS ARS, G4ATH. Meets at the Frank Townsend Centre, Beach Road, Thornton Clevelys, Lancs. Details from Mr J.E. Duddington G4BFH. Tel: (01253) 853554.

MERSEYSIDE

LIVERPOOL & DARS, G3AHD. Meets at the Churchill Conservative Club, Church Road, Wavertree, Liverpool L15. Details from David G. Parr G8DEY.

SOUTH WIRRAL CONTEST GROUP, G3CSA. Details from Mr T.B. Saggerson G4WSE. Tel: 0151-339 0842.

T.B. SAGGERSON & DARC, G20A. Meets at St. Marks Church Hall, Scarsbrick, Lancs. Details from Don Atkins M1BUL.

***WIRRAL & DARC, G4MGR.** Meets at the Ivy Cricket Club, Mill Hill Road, Wirral. Details from Tom G4BKF. E-mail: secretary@wedarc.com Tel: (07050) 291850.

WIRRAL ARS, G3NWR, MX1ARC. Meets at the Club Room, Ivy Farm, Armore Park Road, Wirral L49 5LW. Details from Alan Upton G3UZU. Tel: 0151-677 3266.

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EAST CLEVELAND ARC, G4CRD. Meets at the Committee Room of The New, New Marske Institute Club, Gurney Street, Cleveland TS11 8EG. Details from Malcolm Brass G4YMB. Tel: (01287) 638119.

STOCKTON & DARG, G4XXG. Meets at the Billingham Community Centre, Billingham, Cleveland. Details from David J. London G0VGB. Tel: (01642) 896395.

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DERWENTSIDE ARC, G4PFG. Meets at the Steel Club, 36 Medomsley Road, Consett, Co. Durham. Details from Mr G. Darby G7GIU. Tel: 0191-370 2032.

GREAT LUMLEY AR & ES, G4EUZ. Meets at the Community Centre, Great Lumley, Chester-le-Street. Co. Durham. Details from Nancy Bone G7UUR. Tel: 0191-477 0036, mobile (07990) 760920.

PETERLEE RADIO CLUB, G0KJV. Details from Andrew Pennell G0NSK.

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GOOLE R & ES, G0OLE. Meets at the West Park Pavilion, Goole, South Humberside.

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STH DERBYS & ASHBY W ARC, G0SRC. Meets at the Moira Replian Centre, 17 Ashby Road, Moira, Swadincote, Derbyshire DE12 6DJ. Details from Mrs B. Walley. Tel: (01283) 760822.

STH NORMANTON, ALFRETON & DARC, G0CPO. Meets at the New St. Community Centre, New Street, South Normanton, Derbyshire. Details from Peter Gething M0CQL. Tel: 0115-955 7566.

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WHITE NOISE LISTENING G0WNL. Details from Adrian Deane G7KGC.

HEREFORD & WORCESTER

BROMSGROVE & DARC, G3VGC. Meets at the Avoncroft Arts Centre, Bromsgrove, Worcs. Details from Mr J.F. Burford G4OAZ.

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HEREFORD ARS, G3YDD. Meets at the Civil Defence HQ, Magistrates Court, Gao Street, Hereford. Details from Tim Bridgand-Taylor G0WJW. Tel: (01432) 279435.

KIDDERMINSTER & DARS, G0KRC. Meets at the Sutton Arms, Sutton Park Road, Kidderminster, Worcs. Details from Mr A.W. Saunders G0OZB. Tel: (01299) 400172.

MALVERN HILLS ARC, G4MHC. Meets on the second Tuesday of the month at the Town Club, Great Malvern. Details from Mike G3TGD. Tel: (01905) 830752. E-mail: mike@alensons.fsnet.co.uk

REDDITCH RC, G4ACZ. Meets at the WRFV Centre, Ludlow Road, Redditch, Worcs. Details from Mr R.J. Mutton G3EVT. Tel: (01789) 762041.

VALE OF EVESHAM RAC, G0ERA. Meets at the BBC Club, High Street, Evesham, Worcs. Details from Mr A.C. Lindsay G4NRD. Tel: (01386) 41508.

LIcestershire

1F ATC, G7MCD. Details from Sqn. Cmdr. Adrian Utting G1WZQ.

BEAUMONOR ARC, G3BMR

DEMONTFORT UNIVERSITY, G3SDC. Open to past & present students. Details from Mr R.G. Titterton. Tel: 0116-257 7059.

HINCKLEY AR & ES, G3VLG. Meets at the United Services Club, St. Mary's Road, Hinckley. Details from Mr R.A. Bennett G8BFF. Tel: (01455) 846493.

LICESTER RS, G3LRS. Meets at Gilroes Cottage, Groby Road, Leicester LE3 9QJ. Details from Mr S.P. Hay G3CST. Tel: 0116-224 2598.

LOUGHBOROUGH & DARC, G3RAL. Meets at Hind Leys College, Shephed, Loughborough, Leics. Details from Chns Walker G1ETZ. Tel: (01509) 504319.

MELTON MOWBRAY ARS, G4FOX. Meets at the St. John Ambulance Hall, Astorby Hill, Melton Mowbray, Leics. Details from Mr R. Winters G3NVK. Tel: (01664) 63369.

NATIONAL SPACE CENTRE ARS, M1NSC. Details from Mr J. Heath G7HIA.

TAMWORTH ARS, G8TRS. Details from Mr A.I. Dyson G0WJU. Tel: (01827) 830437.

WELLAND VALLEY ARS, G4WVR. Meets at The Village Hall, The Green, Great Bowden, Leics. Details from The Secretary.

LINCOLNSHIRE

FIVE BELLS GROUP, G4SIV. Details from Mr B.K. Tatrall G40DA.

GRANTHAM RC, G0GRC. Meets at the Kontak Social

SPALDING & DARS, G4DSP. Meets at The Old Fire Station, Spalding, Lincs. Details from Raymond Pearson G8ELV. Tel: (01775) 711953. Web: www.sdars.org.uk

SPILSBY ARS, RS91468. Details from Clive Ironmonger G6HYF. Tel: (01790) 752712.

NORTHANTS

KETTERING & DARS, G5KN. Meets at The Lilacs Public House, 39 Church Street, Isham, Kettering, Northants NN14 1HD. Details from Fay Barwell G6AKS. Tel: (01536) 390954.

MID NORTHANTS AR EXP, GOING. Details from Lionel Parker G5LP.

NORTHAMPTON RC, G3GWB. Meets at the British Timken, Social & Athletic Club, Cotswold Avenue, Duston, Northampton. Details from Norman Miller G0GBZ. Tel: (01327) 349188.

NORTHAMPTON SCOUT AR, G6NDS. Meets at Overstone Scout Activity Centre, Northampton. Details from Ian Rivet G8WPU.

PARALLEL LINES CG, G4LUP. Details from Mr P.S. Lidsay G4CLA.

NOTTINGHAMSHIRE

ARC OF NOTTINGHAM, G3EKW. Meets at the Haywood Road Community Association, Haywood Road, Mapperley Road, Nottingham NG3 6AD. Details from Ron Hague G4XOU. Tel: 0115-919 9177.

DUKIERIES ARS, G4XTL. Meets at Ambleside Community Centre, Ambleside, New Olerton, Notts. Details from Colin Foster G7DEX.

HUCKNALL ROLLS ROYCE ARC, G5RR. Meets at the Hucknall Rolls Royce Sports & Social Club, Watnall Road, Hucknall, Nottingham. Details from Mr P. Hart G4JSM.

MANSFIELD ARS, G3GQC. Meets at the Debdale Park Sports & Recreation Club, Debdale Lane, Mansfield Woodhouse, Notts. Details from David Peat GORDP. Tel: (01623) 631931.

NORTH NOTTS DATA GROUP, GOWNN. Details from Tony Jenkins G8TBF.

SIEMENS ARC, G8ZK, G8GQ. Meets at the GPT Sports Ground, Beeston, Nottinghamshire. Details from Chns Archer G4VFK. Tel: 0115-943 3387.

SOUTH NOTTS ARC, G0OAU. Meets at the Fairham Community College, Farnborough Road, Clifton, Nottingham NG11 9AE. Details from Gary Bishop GOWUG. Tel: (01509) 672846.

WORKSOP ARS, G3RCW. Meets at the Club House, 59-61 West Street, Worksop, Nottingham S80 1JP. Details from Terry Calvert G4GBS. Tel: (01302) 743130.

SHROPSHIRE

OSWESTRY & DARC, G4TTO, G10RA. Meets at the Swesney Hall Hotel, Swesney, Oswestry. Details from Ant Astley GWOAJA. Tel: (01691) 860545.

SALOP ARS, G3SFT, M1AXW. Meets at the Telepost Club, Railway Lane, Abbey Forge, Shrewsbury. Details from John Burnford GOGTN. Tel: (01743) 249943. E-mail: john.burnford@virgin.net

TELFORD & DARS, G3ZME. Meets at the Dawley Bank Community Centre, Dawley, Telford, Shropshire. Details from Mr M. Vincent G3UKV. Tel: (01952) 255416.

STAFFORDSHIRE

BURTON-ON-TRENT & DARS, G3NFC. Meets at the Staphell Institute, Main Street, Staphell, Burton-on-Trent, Staffs. Details from Mr M.W. Cotton G4HBY.

CANNOCK CHASE ARS, G6SW. Meets at the Four Crosses Inn, Watling Street, Hatherton, Cannock. Details from Arnold Matthews G3FZW. Tel: (01543) 262495.

CHAD RC, G4CAR. Meets at the Swinfen Office Club, Swinfen, Lichfield, Staffs. Details from Bernard Jayne G8BFL. Tel: (01543) 268569.

LICHFIELD ARS, G3WAS. Meets at the Queens Head, Sandford Street, Lichfield. Details from Roger Smethers G3NLY. Tel: (01543) 672762.

MOORLANDS & DARS, G4NHT, G1MAD. Meets at the Creta Works, Blythe Bridge, Stoke-on-Trent, Staffs ST11 9LJ. Details from Mr B.J. Butcher G4HGK. Tel: (01782) 395793.

NEWCASTLE-U-LYME SCOUT AR COM GR, G7UQG

STOKE-ON-TRENT ARS, G3GBU. Meets at the '45' Club, 92 Lancaster Road, Newcastle-under-Lyme, Staffs. Details from Albert Allen G4DH0. Tel: (01782) 638801.

SUTTON COLDFIELD RS, G3RSC. Meets at the Rugby Club, Walmley Road, Sutton Coldfield, West Midlands. Details from Paul G. Turner G7MWD. Tel: 0121-350 4263.

WARWICKSHIRE

AVON VALLEY AR, MORAD. Details from Mr Peter Bradham GOWJU. Tel: (01905) 724531.

MID WARWICKSHIRE ARS, G3UDN. Meets at the St. John Ambulance HQ, 61 Emmsote Road, Warwick. Details from Bernard Pittaway. Tel: (01926) 420913.

RUGBY ATS, G4APO. Details from Tony Humphries G0OLS. Tel: (01455) 552683.

STRATFORD-UPON-AVON & DRS, G0SOA. Meets at the Home Guard Club, Tiddington, Stratford-upon-Avon, Warwicks. Details from Ron Horsley G0MRH. Tel: (07970) 148204.

WEST MIDLANDS

ALDRIDGE & BARR BEACON ARC, G0NEQ. Meets at the Aldridge Central Hall Community Centre, Middlemore Lane, Aldridge WS9 8AN. Details from Mr C.J. Baker G0NOL. Tel: (01922) 636162.

COVENTRY ARS, G2ASF. Meets at the Binley Church Hall, Brinklow Road, Coventry. Details from John Beech G8SEQ. Tel: (01203) 673999.

DUDLEY ARC, G4DAR. Meets at the Community Centre, Sedgley, Central Library, St. James Road, Dudley. Details from Tony Lucas G4LVA. Tel: (01384) 277925.

HILLCREST ARS, G0SPM. Meets at The College, Simms Lane, Netherpton, Dudley, West Midlands. Details from Stuart Viney. Tel: (01384) 232457.

KYNOCH R & TVS, G3HPP. Meets at the Club Workshop, IMI Ltd., Sportsfield, Perry Barr, Birmingham. Details from

Mr G. Nicholls. Tel: (01922) 635376.

MIDLAND ARS, G3MAR. Meets at Unit 22, 60 Regent Place, Hockley, Birmingham (jewelry dealer). Details from John A. Crane G0LAL. Tel: 0121-628 7632.

SANDWELL AMATEUR RADIO CLUB, G0CWC. Meets at Sandwell ARC, Broadway, Oldbury, Walsley, West Midlands B68 9DP. Details from Stuart Collins M06TO. Tel: 0121-561 4663.

SIERRA HOTEL ARCC, G0OBS. Details from Warwick M. Hall G4WVH.

SOLIHULL ARS, G3GEI. Meets at The Shirley Centre, 274 Stratford Road, Shirley, Solihull, West Midlands. Details from Paul Gaskin G8AYY. Tel: 0121-783 2996.

SOUTH BIRMINGHAM RS, G30HM. Meets at Hampstead House, Fairfax Road, West Heath, Birmingham. Details from The SBRS Secretary.

STOURBRIDGE & DRS, G6OI, G6SRS. Meets at the Old Swinford Hospital/School, Stourbridge, West Midlands. Details from Tom Edwards.

WEST BROMWICH CENTRAL RC, G4WBC. Meets at The Sandwell Public House, High Street, West Bromwich, West Midlands. Details from Ian Letch G0PAI. Tel: 0121-561 2884.

WEST MIDLANDS POLICE ARC, G0OOP, G1WVMP. Details from Steven Jones G6LRL.

WILLENHALL & DARS, G4ETW. Meets at The Liberal Club, Villiers Street, Willenhall, West Midlands. Details from Dave Bradbury. Tel: (01902) 411252.

WOLVERHAMPTON ARS, G8TA. Meets at the Electricity Board Sports Club, St. Marks Road, Capel Ash, Wolverhampton. Details from Mrs J. Smith. Tel: (01902) 751936.

WORSLEY RC, G4WRA. Meets at the Brick Maker's Arms, Mount Pleasant, Brierley Hill, West Midlands. Details from Andy Evans G1PKZ.

LONDON & CENTRAL

BERKSHIRE

ARBORFIELD ARC, G3HHH. Details from Mrs E.W. Harding 2E1AUQ.

BRACKNELL AEC, G4BRA. Meets at the Coopers Hill Community Centre, Bagshot Road, Bracknell, Berks. Details from John Ellerton G3NCC.

BURNHAM BEECHES RC, G3WR. Meets at the Farnham Common Village Hall, Victoria Road, Farnham Common, Bucks. Details from Mrs Eileen Chislett G6EIL. Tel: (01628) 625720.

MAIDENHEAD & DARC, G3WFX. Meets at the Red Cross Hall, The Crescent, Maidenhead, Berkshire. Details from Neil Savn G0SVN. Tel: (01628) 626210.

***NEWBURY & DARS, G5W.** Meets at the Rugby Club, Monk's Lane, Newbury. Details from Max Maxwell G7DXC. Tel: (01635) 253233.

READING ARC, G3ULT. Meets at the Woodley Pavilion, Woodford Park, Haddon Drive, Woodley, Reading. Details from Marnoch Standen G0JMS. Tel: 0118-972 3504.

BUCKINGHAMSHIRE

AYLESBURY VALE RS, G4VRS. Meets at the Harwick Lodge Hall, Aylesbury, Bucks. Details from Mr L.I. Croyple G0DPC.

CHESHAM & DARS, G3MDG, G1MDG. Meets at the White Hill Centre, Chesham, Bucks. Details from Mr J.J. Thirwell G0VFW. Tel: (01442) 832169.

CHILTERN ARC, G3CAR. Details from Roy Page G4YAN. Tel: (01494) 534216.

MILTON KEYNES ARS, G3HIU. Meets at Bletchley Park Museum (The Green Room, B Block Annex), Wilton Avenue, Bletchley, Milton Keynes. Details from Mrs J. Battersby M1EPL (Secretary) on (01908) 565636 or Frank Collins M0RPM (Chairman) on (01234) 713148.

MILTON KEYNES SCOUT ARS, G0SMK. Meets at The Quarries, M.K. Scout Campsite, Cosgrove. Details from Mr P.A. Orchard G0RYZ. Tel: (01908) 648186.

GREATER LONDON

ADDISCOMBE ARC, G4ALE. Meets at the Lion Inn, Pawns Road, Croydon. Details from Mr Q.G. Collier G3WRP. Tel: 0208-653 6948.

BARKING R & ES, G3XBF. Meets at the Parkside Community Centre. Details from Bill Chewer G0JQK. Tel: (01708) 474443.

BROMLEY & DARS, RS89030. Meets at the Victory Social Club, Kechill Gardens, Hayes, Bromley. Details from Alan G. Messenger G0TLJ.

CLIFTON ARS, G3GHN. Meets at the Kidbrooke House, Community Centre, 90 Myones Road, London SE3 7SE. Details from Mr J. Veaney G7B9H.

CRYSTAL PALACE & DRC, G3VCP. Meets at the All Saints Church, Parish Rooms, Beulah Hill, London. Details from Bob Burns G300U. Tel: (01737) 552170.

DARENTH VALLEY RADIO, G0K0V. Meets at the Crockenhill Village Hall, Swanley, Kent. Details from Mr K.W. Halls G8VJG. Tel: (01322) 663022.

ECHFORD ARS, G3UES. Meets at The Community Centre, St. Martin's Court, Kingston Crescent, Ashford, Middlesex. Details from Robin Hewes G3TDR. Tel: (01784) 456513.

EDGWARE & DRS, G3ASR. Meets at the Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware, Middlesex. Details from Stephen Stair G0PQB. Tel: 0208-953 2164.

HAVERING & DARS, G4HRC. Meets at the Fairytiles Arts Centre, 51 Billet Lane, Hornchurch, Essex.

RS OF HARROW, G3EFX. Meets at the Harrow Arts Centre, Uxbridge Road, Hatch End, Middlesex. Details from Mr C. Fiel G4AUF. Tel: (01895) 621310.

SILVERTHORNE RC, G3SRA, G2HR, G8CSA. Meets at the Chingford Adult Education and Community Centre, Friday Hill House, Simmons Lane, Chingford, London E4 6JH. Details from Dave Christy G0KHC. Tel: 0208-504 2831.

MITCHAM & DISTRICT ARS. Meets at the ACT Hut, Commonsedge West, Mitcham, Surrey CR4 4HB. Details from Mr M. Knott G0WCR.

SOUTHGATE RC, G3SFG. Meets at the Winchmore Hill Cricket Club, Firs Lane, London N21 3ER. Details from Mr D.F. Berry G4DFB.

ST. DUNSTONS COLLEGE ARS, G4SCD. Details from Sam Kennard G40HX. Tel: 0181-690 1274.

SURREY RADIO CONTACT CLUB, G3SRC. Meets at the T.S. Terra Nova, 34 The Waldrons, Croydon, Surrey. Details from Maurice Fagg G4DDY. Tel: 0208-669 1480.

WEST LONDON ARS, RS95599. Details from Robin Clay G0VJ.

WHITTON ARG, G0MIN. Meets at the Whitton Community Centre, Percy Road, Whitton. Details from Ian Clobon G0OFN. Tel: 0208-894 9131.

HERTFORDSHIRE

BISHOPS STORTFORD ARS, G5ZG. Meets at the Royal British Legion Club, Windhill, Bishop's Stortford, Herts. Details from Tony Judge G0PQF. Tel: (01279) 506933.

DACORUM ARTS, G7RIH, G0WIH. Meets at the Guide Meeting Rooms (next to the Royal British Legion), Queensway, Hemel Hempstead. Details from Ian Hamilton G0TCD. Tel: (01442) 211925.

HODDESDON RADIO CLUB, G0TSN. Meets at the Rye Park Conservative Club, Rye Road, Hoddesdon, Herts. Details from Don Platt G3JNJ. Tel: 0208-292 3678.

MIMRAM CONTEST GP, M0ABC. Details from Alan Holdsworth G800. Tel: (01707) 392950.

RADIO SCOUTING TEAM, G62RST. Meets at Tolmers Scout Camp, Tolmers Road, Cuffley, Herts EN6 4JS. Details from Mill Livens G20VB. Tel: (01992) 558493.

STEVENAGE & DARS, G3SAD. Meets at the Stevenage Day Centre, Chells Way, Stevenage, Herts SG2 0LT. Details from Peter Bel 2E1CRK. Tel: (01462) 674505.

VERULAM ARC, G3VER, C8VER. Meets at the RAF Association HQ, New Kent Road, St. Albans, Herts. Details from Walter Crane G3PMF. Tel: (01923) 262180.

WELWYN & HATFIELD ARC, G3WGC. Meets at the Royal Naval Association, Black Fan Road, Welwyn Garden City, Herts. Details from Dean Jackson G7PKF. Tel: (07973) 560649.

SURREY

BENTLEY ARC, G0VZS. Details from Derek Gilbert G0NFA.

CATERHAM RG, G0SCR. Details from Mr P.N. Lewis G4APL.

COULSDON AMATEUR TRANS. SOC., G4FJR. Meets at St. Swifuns Church Hall, Crowlands Road, Purley, Surrey. Details from Andy Bners G0KZT. Tel: (01737) 552139.

ORKING & DRS, G3CZU, G7DOR. Details from John Greenwell G3AEZ. Tel: (01306) 631236.

FARNBOROUGH & DRS, G4FRS. Meets at the Community Centre, Meadon Avenue, Farnborough, Hants. Details from Mr M. Hearsey G8ATK. Tel: (01252) 715765.

GUILDFORD & DRS, G6GS. Meets at the Guildford Model Engineers HQ, Stoke Park, Guildford, Surrey. Details from Stella Whitbourn G0SWE.

KINGSTON & DARS, G3KIN. Details from Mrs Mary Ashdown G0BQV.

REBGATE ATS, G5LJK, G7RAT. Details from Mr A.C. Embling G1LNT. Tel: (01883) 344723.

SUTTON & CHEAM RS, G2XP, G7SAC. Meets at the Sutton United Football Club, Borough Sports Ground, Gander Green Lane, Sutton, Surrey. Details from John Puttock G0BWV. Tel: 0208-644 9945.

THAMES VALLEY ARTS, G3TVS. Meets at the Thames Ditton Library, Watts Road, Gigg's Hill, Thames Ditton, Surrey. Details from Cdr. J. Pegler G3ENI. Tel: (01483) 284279.

WIMBLEDON & DARS, G3WIM. Meets at St. Andrews Church Hall, Herbert Road, Wimbeldon, London. Details from Mr Reg Blackwell M1EJK. Tel: 0208-696 9857.

SOUTH & SOUTH EAST

EAST SUSSEX

BRIGHTON RADIO CLUB, G4GQR. Meets at Vallance Community Centre, Sackville Road, junction of Connaught Road, Hove. Details from Hon. Sec G0RNS. Tel: (01273) 699104.

CROWBOROUGH DARS, G0CWR. Meets at the Plough & Horses, Walsley Road, Janes Brook. Details from Mrs M. Clark. Tel: (01892) 863666.

EAST SUSSEX AMATEUR TV GROUP, RS178475. Meets at G3VXV. Details from Keith Ellis G8HGM. Tel: (01323) 720220.

SOUTHDOWN ARS, G3WQK. Details from Jim Harris G4DRV. Tel: (01323) 728479.

THE QRZ ARG OF SUSSEX, G3BVX. Meets at the Coach Station, Watling Road, Eastbourne. Details from Stuart Constable M0CHW. Tel: (01435) 863020.

HAMPSHIRE

ANDOVER RAC, G0ARC. Meets at the Village Hall, Withern, Andover, Hants. Details from Mr R.S. Coleman G0WYD.

BASINGSTOKE ARC, G3TCR, G8JYN. Meets at the GEMS Social Club, Lister Road, Basingstoke, Hants. Details from Bob Brown M0DJJ.

FAREHAM & DARC, G3VEE. Meets at the Portchester Community Centre, Westlands Grove, Portchester, Hants. Details from Andrew Sinclair G0AMS. Tel: (01329) 235397.

HIGHFIELD PARK RC, G4WID. Meets at Highfield Park RC, National Air Traffic Service, Highfield Park, Heckfield, Hants RG27 0LD. Tel: (01734) 225019.

HORNDEN & DARC, G4FBS. Meets at Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. Details from Stuart Swan G0PFR. Tel: (01705) 472846.

ITCHEM VALLEY ARC, G0IVR. Meets at the Scout Hut, Brockfield Lane, Chandlers Ford, Eastleigh, Hants. Details from Sheila Williams G0VNI. Tel: (01703) 813827.

SONY BROADCAST ARC, G4SZC. Accredited G&G RAE centre. Meets at Sony Sports & Social Club, Priestley Road, Basingstoke. Details from Stephen Harding G4JGS.

Tel: (01256) 55011.

SOUTH HAMPSHIRE INT. TELE SOC., G3DIT. Meets at G3ZV's QTH, space is limited. Details from Rev. T.R. Mortimer G3JZV. Tel: (02392) 649324.

SUBMARINE ARC, G3BZU. Meets at HMS Collingwood, Newgate Lane, Fareham, Hants P014 1AS. Details from Mr W.S. Blyth G0PPH. Tel: (01329) 232386.

THREE COUNTRIES ARC, G4WWR. Meets at the Bramshott Pansh Inn & Club, Headley Road, Liphook, Hants. Details from Damian Kamm G7RVF. Tel: (01428) 724456.

WATERSIDE ARS, G4JYN. Meets at the Applemore Scout HQ, Applemore, Hythe, Southampton. Details from Tony Horton G0LGS. Tel: (01703) 841794.

ISLE OF WIGHT

BRICKFIELDS ARS, G0BAR. Meets at Brickfields Horse Country Cent, Newnham Road, Binstead, Isle of Wight. Details from Mr Pebody.

ISLE OF WIGHT RS, G3SKY. Meets at The Old Cafe, Whitecalf Bay, Holiday Park, Bembridge. Details from Alan Reeves G4ZFX. Tel: (01983) 294309.

OXFORDSHIRE

BANBURY ARS, G0BRA. Meets at St. John's Church Social Club, South Bar, Banbury, Oxon. Details from Mr R.S. Marsden G1YSY. Tel/FAX: (01235) 255050.

HARWELL ARS, G3PIA. Meets at the Social Club, Harwell Laboratory, Didcot, Oxon. Tel: (01235) 232350.

OXFORD & DARS, G5LO. Meets at the Grove House Club, George Street, Summertown, Oxford. Details from Mr D. Walker G3BLS. Tel: (01865) 247311.

VALE OF WHITE HORSE ARS, G5RP, G4WVH, G6VWH. Meets at The Fox, Stevenage. Details from Ian White G3SEK. Tel: (01235) 531559.

WEST SUSSEX

CHICHESTER ARC, G2NM. Meets at the St. Pancras Hall, Chichester. Details from Graham Swann G0WSD.

CRAWLEY ARS, G3WSC. Meets at the Tilgate Forest Rec. Centre, Hut 1B, Tilgate Forest, Crawley, West Sussex. Details from Mr J.S. Spence G0PPI.

HORSHAM ARC, G4HRS. Meets at the Guide Hall, Denne Road, Horsham, West Sussex. Details from Alistair Watt G3ZBU. Tel: (01403) 253432.

MID SUSSEX ARS, G3ZMS. Meets at Marie Place, Leylands Road, Burgess Hill, West Sussex. Details from Mr C. Childs 2E1DCP. Tel: (01444) 244689.

T.S. VINDICATRIX ASN, G0WVB. Details from Don Still G00DC.

WORTHING & DARC, G3WOR. Meets at the Lancing Parish Hall, South Street, Lancing, West Sussex.

WORTHING & DISTRICT VIDEO RG, G3BVR. Details from the Treasurer. Tel: (01903) 211919 (w).

WILTSHIRE

CHIPPENHAM & DARS, G3VRE. Meets at the Sea Cadet HQ, Chippenhams, Details from Jon Ainge G4LZG. Tel: (01249) 462610.

SWINDON & DARC, G3FCE. Meets at the Eastcott Community Centre, Savenack St., Swindon. Details from Den Forrest M0ADM.

TROWBRIDGE & DARC, G2BQY. Meets at the Southwick Village Hall, Southwick, Trowbridge, Wilts. Details from Ian Carter G0GRI. Tel: (01225) 864698.

SOUTH WEST & CHANNEL ISLANDS

AVON

BRISTOL ARC, G3TAD. Meets at the Lodgeside Club, Lodge Road, Kingswood, Bristol. Details from Dave Brendry G7BYN.

GORDANO ARG, G6GRG. Meets at The Ship, Redcliffe Bay, Portishead, Avon. Details from Mr R.T. White G8SPC. Tel: (01275) B74001.

NORTH BRISTOL ARC, G4GCT. Meets at the Self Help Enterprise, 7 Braemar Close, Northville, Bristol. Details from David Coxon G0GHM. Tel: (01275) 790448.

SEVERNSIDING TV GROUP, G3ZZZ. Meets at NBARC, Filton, Bristol. Details from Paul Stevenson G8YMM. Tel: 0117-965 5386.

SHIREHAMPTON ARC, G4AHC. Meets at the TS Enterprise Sea Cadet Unit, Station Road, Shirehampton. Details from Mr R.G. Ford G4GTD. Tel: 0117-985 6253.

SOUTH BRISTOL ARC

DARTMOOR RADIO CLUB, G1RCD, G0DRC. Meets at the Yelverton War Memorial Village Hall, Meavy Lane, Yelverton, Devon. Details from Ron Middleton G7LLG. Tel: (01822) 852586

EXETER ARS, G4AFR. Meets at the Moose Centre, Spinning Path Lane, Blackboy Road, Exeter. Details from Ray Dolno G3YBK

EXMOUTH ARC, G0RRC. Meets at The Scout Hut, Marpool Hill, Exmouth.

NORMAN LOCKYER OBSERVATORY ARG, G000C. Meets at the Norman Lockyer Observatory, Salcombe Hill, Sidmouth. Details from Ron Hanson G0H0C Tel: 01395 515349.

NTE (PAIGNTON) ARS, G00SH. Meets at Paignton Community College, Upper School, Waterfeet Road, Paignton. Details from Rod Maude G0S Tel: 01395 521066.

TORBAY ARS, G3NUA. Meets at the Harwood Family & Social Club, Highweek, Newton Abbott, Devon. Details from John Gwyn G3NMA. Tel: (01802)

UNIVERSITY OF PLYMOUTH ARS, G0000. Details from Alan Santillo G0XAW.

DORSET

BLUNDELL VALE ARS, G0000. Meets at Shaftesbury Club for Young People, Coplice Street, Shaftesbury, Dorset SP7 8PF. Details from Alan Gwyn G0GL. Tel: (01258) 860741.

BOURNEMOUTH PS, G0000. Meets at the Kinson Community Centre, Kinson, Bournemouth, Dorset. Details from Chris R. Ellis G0000. Details from The Close, St. Leonards, Bournemouth, Dorset BH1 1JH. Tel: (01202) 893126.

CHRISTCHURCH ARS, G0000. Meets at the Siemens Plessey Sports & Social Club, Orange Road, Somerford, Christchurch, Dorset. Details from Alan Gwyn G7WSN. Tel: (01202) 464992.

FLIGHT REFUELLING ARS, G0000. Meets at the Flight Refuelling Social Club, Merton, Bournemouth, Dorset. Details from Martin Avon G2FLG. Tel: (01202) 993334.

POOLE ARS, G4PPE. Meets at the Bourneham & Poole CFE, Constitution Hill Ste. Poole, Dorset. Details from Paul Mayer G0KML. Tel: (01202) 860741.

PORTLAND ARC, G0000. Meets at Clifton Hotel, Grove Road, Portland. Details from Alan Gwyn G1WIK. Tel: (01305) 789224.

SOUTH DORSET ARS, G0000. Meets at the Church Hall, Chickwell, Weymouth, Dorset. Details from John Rose M0B30. Tel: (01305) 789224.

SWANAGE & PURBEORNE ARS, G0000. Meets at Kings Arms, Langton Matravers, Dorset. Details from Peter Vassell G1MVC. Tel: (01305) 624423.

WESSEX AMATEUR RADIO CLUB, G0000. Details from Alan Gwyn G1131. Tel: (01202) 860741.

JERSEY

JERSEY ARS, G3JDE. Meets at the German Signal Station, Rue Baal, La Moie, St. Helier, Jersey. Details from Mrs Anne Mourant M0B30. Tel: (01534) 744444.

SOMERSET

BRANTREE DISTRICT AMATEUR RADIO SOCIETY, G0000. Details from George Woods G4LPT. Tel: (01473) 642595.

TAUNTON & DAPS, G0000. Meets at The Memorial Hall, Trull, Taunton. Details from Paul Whiting G4YQC. Tel: (01473) 642595.

WEST SOMERSET ARC, G0000. Meets at the Fleet Somerset Community Centre, Midsomer Norton. Details from Alan Gwyn G1131. Tel: (01202) 860741.

WINCANTON ARC, G0000. Meets at King Arms Community School, West Hill, Wincanton. Details from G.A. Pinnock G0EM. Tel: (01454) 830000.

YEovil D.P.C. G3CJM, G0000. Meets at the Brush Red Cross HQ, 72 Grove Avenue, Yeovil, Somerset. Details from George Davis G3CJO. Tel: (01306) 860741.

ESSEX

BRANTREE DISTRICT AMATEUR RADIO SOCIETY, G0000. Meets at the Brantree Hockey Club, Church Street, Brantree, Baintree. Details from John M5UD. Tel: (01473) 642595.

CHELSEA D.P.C. G3CJM, G0000. Meets at the Marconi Social Club, Beehive Lane, Chelmsford, Essex. Details from Alan Gwyn G1131. Tel: (01245) 602838. E-mail: alan.gwyn@bt.com

CLACTON RADIO CLUB, G3CRC. Details from Mr D. Fitzpatrick M0CFL. Tel: (01473) 642595.

COLCHESTER ARS, G1VCO. Meets at the Colchester Institute, Sheepen Road, Colchester. Details from Frank R. Home G3. Tel: (0206) 951189.

DECEMBER ARS, G0000. Meets at the Mark Hall Barn, First Avenue, Harlow, Essex. Details from Len Braehstone G7UFF. Tel: (0206) 951189. Tel: (01279) 864973.

HARLOW ARS, G0000. Meets at the Park Pavilion, Barkack Lane, Harlow. Details from Len Braehstone G7UFF. Tel: (01279) 864973.

LOUGHTON & BURNHURST ARS, G0000. Details from Alan Gwyn G1131. Tel: (01202) 860741.

SOUTH ESSEX ARS, G0000. Meets at the P. docks, Long Road, Canvey Island, Essex. Details from Alan Gwyn G1131. Tel: (01202) 860741.

SOUTHEND & D.P.C. G3CJM, G0000. Meets at the Newmarket Yacht Club, Clifton Parade, Southend-on-Sea. Details from Alan Gwyn G1131. Tel: (01202) 860741.

STANFORD LE MOPEL & BICYCLE CLUB, G0000. Meets at the Joseph Parish Rooms, S. Essex. Details from Alan Gwyn G1131. Tel: (01202) 860741.

VANGE ARS, G3VNC. Meets at the Vange Community Centre, Basildon, Essex. Details from Alan Gwyn G1131. Tel: (01268) 552605.

KENT BREDHURST RX & TX SOC, G0000. Meets at Bredhurst, Kent. Details from Alan Gwyn G1131. Tel: (01686) 552605.

Avenue Working Mans Club, Rock Avenue, Gillingham, Kent. Details from Mr T.M. Wheeler G7MIM.

GRIN HILLET ARS, G3RNC, G1RCV. Meets at the Progress Hall, Admiral Seymour Road, Etham, North SE9. Details from Richard Peggina G81TB. Tel: (01689) 602948.

DOVER RADIO CLUB, G3YMD. Meets at the Dover Grammar School for Boys, Astor Avenue, Dover. Jim Cams M1BK. Tel: (01304) 852773.

EAST KENT RADIO SOCIETY, G0EKR. Meets at St. Bartholomew's Church Hall, Heme Bay. Details from Paul Nicholson G3VJF. Tel: (01227) 743070, FAX: (01227) 742288.

HASTINGS ELFC. & RC, G6HH, G1HHH, G5LL. Meets at Hastings, Sussex. Details from Mr J. Boothroyd G0MTJ. Tel: (01223) 732656.

HILDERSTONE ARS, G0HRS. Meets at Hilderstone A.E.C., Broadstairs, Kent. Details from Mr G. Shaw M0AQA. Tel: (01664) 721574.

HOME COUNTIES ATV GRP, G6CHI. Meets at the Binfield Club, Binfield (near M4/J10). Details from Mr A. Bradler G4JGZ.

MAIDSTONE YMCA ARS, G3TRF. Meets at YMCA Sports Centre, Melrose Close, Maidstone, Kent. Details from Colin G0VAR. Tel: (01622) 736636.

MEDWAY ARTS, G5MIA, G6IWA. Meets at Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham. Details from Mr J. Hale G3FTH.

NORTH KENT ARS, G4CWC. Meets at The Pop-in-Parlour, Graham Road, Bexleyheath, Kent. Details from Mr A.V. Fittbens G8MLQ. Tel: (01474) 365694.

SWALE ARK, G4SRC, G6SRC. Meets at the Ivy Leaf Club, Dover Street, Stington, Kent. Details from Gordon Pinnock M0AQA. Tel: (01795) 665559.

THE MDRSE CLUB, G400E. Meets at The Five Wents Memorial Hall, Swanley/Hextable Road. Details from Ken M3CZA. Tel: 0208-306 3544.

WEST KENT ARS, G3WKS. Meets at the St. Marks School Hall, Tunbridge Wells, Kent. Details from Malcolm Sheppard G4FWG. Tel: (01892) 652272.

NORFOLK

ANGIA TELEVISION ARS, G0TXV. Meets at Anglia TV, Norwich NR1 3JG. Details from Jim Bacon G3VLA. Tel: (01603) 615151.

GREAT YARMOUTH RS, G3YRC. Meets at the Bradwell Community Centre, Bradwell, Great Yarmouth, Norfolk. Details from Mr A.D. Bedford G3NHU.

GRESHAM'S SCHOOL ARC, G3P3O. Details from Rev. R.N. Myrland G3P3O.

KINGS LYNN ARC, G3KYZ. Details from Derek Franklin G0WDL.

NORFOLK ARS, G0000. Meets at Norwich Aviation Centre, Norwich Airport. Details from Janis Weoman G0VZD. Tel: (01953) 604769.

NORTH NORFOLK ARG, G82MC. Details from Tony Smith G4FAI. E-mail: g4faia@comcast.net

SUFFOLK BURY ST EDMONDS ARS, G2TO. Meets at the Culford School Outfod, Bury St. Edmunds, Suffolk. Details from George Woods G4LPT.

FELTSTOWE & DARS, G4ZFR. Meets at the Orwell Park School, Nacton, Near Ipswich. Details from Paul Whiting G4YQC. Tel: (01473) 642595.

FRAMLINGHAM COLLEGE ARC, N00BB. Tel: (01278) 727232.

IPSWICH RADIO CLUB, G4IRC. Meets at the Golden Hind, Nacton Road (3rd Wednesdays at The Hollies, Bucksham Straight Road), Ipswich. Details from Keith Gaunt G7CY. Tel: (01394) 420226.

LEISTON ARC, G0TUQ. Meets at Leiston Town Athletic Assn., Victory Road, Leiston, Suffolk. Details from Paul O'Brien M3MVG. Tel: (01728) 746044.

LOWESTOFT DRS, G3JRM. Meets at The George Barrow Hotel, Lowestoft, Suffolk. Details from Phil Holden G0JSG. Tel: (01502) 585448.

MARTLESHAM RS, G4MRS. Meets at the BT Laboratories, Martlesham Heath, Ipswich, Suffolk. Details from Darren Hill. Tel: (01473) 644475.

WELLS HALL DRA, G0SPL, G1SPH. Meets at the Old School, Wells Hall Road, Great Cornard, Sudbury, Suffolk. Details from Bryan Penlon G1TVI.

SITTINGBOURNE GROUP, G8TMM. Details from Peter Pinnock G0EM. Tel: (01473) 631313.

NORTH WALES

CLWYD

CLWYD HILL ARC, G4W6TM. Meets at the Studio, Penrhos Road, Colwyn Bay, Clwyd. Details from Mr R.W. Evans G0PIC. Tel: (01745) 855068.

HALKIN & DARS, G3HRG. Details from Mr D. Austin G4XHG.

NORTH WALES PS, G4W4R. Meets at the Old YMCA, Queen's Drive, Colwyn Bay, Clwyd. Details from T. S. S. G0JDSJ. Tel: (01745) 336939.

WREHAM ARS, G4W4M. Meets at the Community Centre, Maesgwyn Road, Wrexham. Details from Mr P. Moran G00ER.

GWYNEDD

MEIRION ARS, G4W4ZP. Meets at the Royal Ship Hotel, Dolgellau, Gwynedd. Details from Gervase Griesse G4URJ. Tel: (01341) 421028.

PORTHMADOG & DARS, G4W4V. Meets at The Yacht Club, The Harbour, Porthmadog, Gwynedd. Details from Mr J. Gwynedd M10FN.

THE DRAGON ARC, G4W4TA. Meets at the Ebenezer Church Hall, Lon Foel Craig, Llanfaiwl, Isle of Anglesey. Details from Alan Gwyn G1131. Tel: (01248)

POWYS

POWYS ARS, G4W4V. Meets at the ATC HQ, Park Lane, Newtown, Powys. Details from Mrs Jean Brown 2W1CEZ.

Tel: (01686) 640814.

SOUTH WALES

DYFED

ABERPOWTH YMCA, G4W4SZV. Meets at the Hut B17, The Airfield, Aberporth. Details from Mr G. Carruther G4W4HU. Tel: (01239) 811205.

ABERSYSTWYTH & DARS, G4W4ARA. Meets at the Scout Hut, Plasgyn Avenue, Aberystwyth. Details from John Woodward G4W4DK. Tel: (01970) 890857.

CARMARTHEN ARS, G4W4YOT. Meets at The Aelwyd Care Home, Carmarthenshire County Council, Tregynwr Road, Llangunor, Carmarthen SA31 3BS. Details from Mr W.D. Hughes G4W4ZL. Tel: (01267) 231359.

CLEDDAU ARS, G4W4SYG. Details from Trevor Pery G4W4XK. Tel: (01646) 600725.

LLANELLI ARS, G4W4OZQ. Meets in the Furnace Community Hall, Furnace Square, Llanelli. Details from Roy Jones G4W4JZK. Tel: (01554) 820207.

PENBROESHOPE ARS, G4W4EJE. Meets at Furzy Park Community Centre, Furzy Park, Haverfordwest, Pembrokeshire. Details from Ian H. Jones M10CAB. Tel: (01437) 363028.

GWENT

ABERDARE ARS, G4W4GFL. Meets at The Hill Residential College, Pen-y-Pound, Aberdare, Gwent. Details from Glyn Hughes G4W4DQY. Tel: (01633) 483186.

BLACKWOOD & DARS, G4W4GWH. Meets at the Oakdale Comprehensive School, Oakdale, Blackwood, Gwent. Details from John Evans G4W4TI. Tel: (01495) 225178.

EBBVALE COLLEGE ARS, G4W4OIM. Meets at the Gwent Tertiary College, Ebbw Vale Campus, College Road, Ebbw Vale, Gwent. Details from Mr T. Hayman G4W4OHCN. Tel: (01495) 305192.

NEWPORT ARS, G4W4CWN. Meets at the Brynglas Community Centre, Brynglas Road, Newport, Gwent. Details from Paul Nicholas.

PONTYPOOL ARS, G4W4R3NH. Meets at the Settlement, Rockhill Road, Pontypool, Gwent. Details from Gramam Smit G4W4OOL.

MID-GLAMORGAN

RYDFORD & DARS, G4W4GFL. Meets at the Club Brynmryn, Brynmryn, Btdgend. Details from Alan Hurrell. Tel: (01656) 721574.

HOOPER HEATH, PC, G3P3OB. Meets at the Hoover Sports Pavilion, Hoover Hill, Pentrebach, Merthyr Tydfil, Mid Glamorgan. Details from Robert Cummings G4W4ORV.

MID GLAMORGAN ARG, M4W4OON. Meets at Aberkenfig Sports & Social Club, Details from Mervyn Carey G4W4VSE. Tel: (01656) 734668.

SOUTH GLAMORGAN

BAILEY HILL, G4W4CC. Meets at Sully Sports & Leisure Club, South Road, Sully, S. Glamorgan. Details from Rhys Jones G4W4SJJ. Tel: (01446) 738756.

HIGHFIELDS ARC, G4W4LFO. Meets at the Highfields Physically Handicapped Centre, Allensbank Road, Cardiff. Tel: (01222) 561542.

WEST GLAMORGAN

BRISTOL & DARS, G4W4CC. Meets at the British Steel PLC Sports & Social Club, Margam, Port Talbot, West Glamorgan. Details from Mr J. Cinnah M10AGE.

SWANSEA ARS, G4W4CC. Meets at the Applied Sciences Building, Swansea University. Details from Frank Burrow G4W4BME. Tel: (01792) 390233.

SCOTLAND WEST & WESTERN ISLES

CENTRAL REGION

FALLEN & DARS, G0E0FR. Meets in the 62nd Forth Valley Scouts Hall, Denny Road, Larbert, Nr. Falkirk. Details from Brian J. Widdow G4W4XQJ. QTHR or E-mail: g4w4xqj@btinternet.com

STIRLING & DARS, G0VNR. Meets at Bandeath Industrial Estate, Throsk, Nr. Stirling. Details from John Sherry G4W4OAZ. Tel: (01324) 824709.

DUMFRIES & GALLOWAY

STRANRAER ARS, G4W4OAZ. Meets at the Aird Unit, Stranraer Academy, Stranraer, (entrance from Cairnport Road). Details from Neil Macdonald G4W4LQS.

STRATHCLYDE

AYR ARC, G4W4YR. Meets at the University of Paisley, University Campus, Beech Grove, Ayr KA8 0HN. Details from John Sheehy M10JAS. Tel: (01292) 445599.

CENTRAL SCOTLAND FM GROUP, RS3872B. Details from Thomas Sialler G4W7TU. Tel: (01698) 816793.

DALRY ARG, M4W4DAR. Meets at The Turf, In Dalry Court, Hill Street, Dalry. Details from Alex McKersman M10DAB. Tel: (01294) 823295.

DUNOON & DARS, G4W4OCD. Meets at the Edward Street Community Centre, Edward Street, Dunoon. Details from A.B. Horton G4W4OBL. Tel: (01369) 840217.

HELENSBURGH ARC, G4W4HELL. Details from G. Caplan G4W4OAF. Tel: (01436) 675922.

INVERCLYDE ARC, G4W4OJK. Meets at the Cardwell Bar, Cardwell Road, Gourcock, Strathclyde. Details from Andrew Giers G4W4YOR. Tel: (01475) 638226.

HILMARNOCK & LOUDOUN ARC, G4W4DAX. Meets at the Hilmarnock Community Centre, Cessnock Road, Hurlford. Details from Steve Campbell G4W4OSS. Tel: (01560) 483800.

LARGS & DARS, G4W4OVB. Details from Mr J. Clouston G4W4OVD. Tel: (01475) 565854.

LORN ARS, G4W4LRA. Details from T. O'Brien G4W4OEW. Tel: (01866) 2580.

MID LANARK ARS, G4W4PKM. Meets at the Newarthill Community Ed. Cent., High Street, Newarthill, Motherwell, Lanarkshire ML1 5GU. Details from John Neary G4W4XFK. Tel: (01698) 822860.

MILTON OF CAMPSIE ARS, G4W4MDC. Meets at The Red Cross Hall, Kirkintilloch. Details from John MacKinnon G4W4OJU. Tel: (01360) 312951.

PAISLEY ARC, G4W4PYM. Meets at the Paisley YMCA Hall, 5 New Street, Paisley PA1 1XU. Details from John G. G4W4OQA. Tel: 0141 889 6860

SCOTTISH DIGITAL COMMS, G6P, G4W4YSR. Details from Stuart Clark G4W4VBE. Tel: (01698) 884803.

WEST OF SCOTLAND ARS, GS44GG. Meets at the Multi Cultural Centre, 21, 23 Rose Street, Glasgow. Details from Hon. Sec.

SCOTLAND EAST & HIGHLANDS

BORDERS

BURGH ARS, G00BR. Meets at the St. John Ambulance Hall, Benwick-upon-Tweed. Details from A.M. McChesney G4W4OBY. Tel: (018907) 504929.

GALASHIELS & DARS, G4W4YEQ. Meets at the Focus Centre, Galashiels. Details from Jim Keddie G4W4TLN.

KELSO ARS, G4W4MHS. Meets at the Abbey Row Community Centre, Kelso. Details from Margaret Chalmers G4W4ALX. Tel: (01573) 226372.

FIFE

G4W4OPTHES & DARC, G4W4GRC. Meets at the Football Pavilion, Station Road, Thornton, Fife. Details from Alexander Adam G4W4OVD. Tel: (01592) 874374.

GRAMPIAN

PERTH ARS, G4W4BSO. Meets at the Red Cross HQ, 22 Queens Road, Aberdeen. Details from Robert Duncan. Tel: (01224) 896142.

BANFF & DARS, G4W4CPT. Meets at the Princess Royal Park Football Ground, Conference Room (Deveronvale F.C.), Banff. Details from Steve Roberts G4W4HVS. Tel: (01888) 551377.

MORAY FIRTH ARS, G4W4TIV. Meets at the Grant Arms Hotel, Fochabers. Details from Geoff Crowley G4W4TJC. Tel: (01542) 882818.

HIGHLAND REGION

GLASGOW ARS, G4W4GZP. Details from R. Johnston G4W4TAL. Tel: (01397) 702016.

INVERNESS ARC, G4W4TFE. Meets at the Emergency Operations Centre, Inverness (except July and August). Details from R.F. Goodall G4W4OOGZ. Tel: (01463) 811701.

LOTHIAN

COCKENZIE & PORT SETON ARC, RS177035. Meets at the Thorntree Inn, Lounge Bar, Old Cockenzie High Street, Cockenzie, E. Lothian. Details from Mr Bob Glasgow G4W4YVZ. Tel: (01675) 811723.

LOTHIANS RS, G4W4HAM. Meets at the Orwell Lodge Hotel, Polwarth Terrace, Edinburgh EH11 1NH. Details from Thomas G. Main, Sec.

ORKNEY

ORKNEY ARS, RS14179. Details from Mrs Terry Pennie. Tel: (01836) 741233.

SHETLAND ISLANDS

LEIFUR ARS, G4W4ZET. Meets at the Islesburgh Community Centre, King Herald Street, Lerwick, Shetland. Details from Ian C. Millar G4W4RWD. Tel: (01950) 460306.

TAYSIDE REGION

DUNDEE ARS, G4W4OAZ. Meets at the Dundee College, Graham Street Annex, Dundee. Details from Mike Hayes M10DUN. Co Dundee ARC. 60 Duns Crescent, Dundee. Tel: 01482 0020.

PERTH & DARS, G4W4EAF. Meets at the Perth Sports & Social Club, 2B Leonard Street, Perth. Details from Ron Holmes G4H3H. Tel: (01738) 643435.

STRATHMORE & DARC, G4W4GBZ. Meets at 2231 Sqdn ATC, 1 Lochside Road, Forfar. Details from Graham Scatford G4W4OBSX. Tel: (01307) 468824.

N. IRELAND

CO. ANTRIM

ANTRIM & DARS. Meets at the Clotworthy Arts Centre in the Castle Grounds in Antrim. Details from David Hutchinson G4W4LRL or e-mail: g4w4lrl@bt.com

BALLYMENA ARC, G4W4TIV. Meets at 70 Nursery Road, Grasshill, Ballymena, Co. Antrim. Details from Jeffrey Globe G4H4C. Tel: (01266) 659769.

CARRICKFERGUS ARC,

International Radio Clubs

AMSAT-UK (G0AUK)

Information from Jim Heck G3WGM, Badgers, Letton Close, Blandford, Dorset BH11 7SS. E-mail: g3wgm@amsat.org or visit www.uk.amsat.org

British Amateur Radio Teledata Group (BARTG - G4ATG, GB2ATG)

Contact Membership Secretary Andrew Thomas G8GNI, M5AEX, Dame School House, 103 High Street, Stony Stratford, Buckinghamshire MK11 1AT, E-mail: members@bartg.demon.co.uk or visit www.bartg.demon.co.uk

British Amateur Television Club (BATC - RS38114)

Enquiries to Dave Lawton G0ANO, 'Grenehurst', Pinewood Road, High Wymcombe, Bucks HP12 4DD. Tel: (01494) 528899. E-mail: memsec@batc.org.uk or visit www.batc.org.uk

British DX Club (BDXC-UK)

Enquiries to Club Secretary Colin Wright, 126 Bargery Road, London SE6 2LR. E-mail: secretary@bdxc.org.uk or visit www.bdxc.org.uk

Danish Shortwave Club

Information from Treasurer Bent Nielsen, Egekrogen 14, DK-3500 Vaerloese, Denmark or visit www.dswci.org

International Listeners' Association (RS88763)

Details from Trevor Morgan GW4OXB, 1 Jersey Street, Hafod, Swansea SA1 2HF. E-mail: gw4oxb@net.nfl.com

International Short Wave League (ISWL - G4BJC)

Information from Honorary Secretary Bill Mackie, G9137/G4AIE, 23 College Park, Horncastle, Lincs LN9 6RE. E-mail: bill.mackie@zetnet.co.uk or visit www.iswl.org.uk



Military Wireless Amateur Radio Society (G0PTZ)

Further details from John Taylor-Cram, 7 Hart Plain Avenue, Cowplain, Waterlooville, Hampshire PO8 8RP. Tel: 0239-225 0463.

Radio Amateurs Invalid and Blind Club (RAIBC - G4IBC, G0IBC, GB1IBC)

Enquiries to Honorary Treasurer/Membership Secretary Mrs Shelagh Chambers, 78 Durlay Avenue, Pinner, Middlesex HA5 1JH. Tel: 0208-868 2516.

Radio Amateur Old Timers' Association

Enquiries to Membership Secretary Ted Rule, G3FEW, 15 Norwich Road, Lenwade, Norwich NR9 5SH. Tel: (01603) 872309, E-mail: edit@raota.fsnet.co.uk or visit www.raota.supanet.com/

Remote Imaging Group (RS88803)

Further details from the Membership Secretary John Din, 59 Woodend Road, Coalpit Heath, Bristol BS36 2LH. FAX: (01454) 887880. E-mail: membership@rig.org.uk

Royal Air Force Amateur Radio Society (RAFARS - G8FC, G8RAF)

Details from the Administrator, HQ RAFARS, RAF Cosford, Wolverhampton WV7 3EX. Tel: (01902) 372722, E-mail: administrator@rafars.org

Royal Navy Amateur Radio Society (RNARS - GB3RN, G3CRS, G1BZU)

Enquiries to Secretary Philip Manning G1LKJ/M3LKJ, 1 Waverley Gardens, Ash Vale, Surrey GU12 5JP. Tel: (01252) 334929, E-mail: g1lkj@amsat.org or visit www.rnars.org.uk



Royal Signals Amateur Radio Society (RSARS - G4RS)

More information from General Secretary, HQ RSARS, Cole Block, Blandford Camp, Dorset DT1 8RH. Tel: (01258) 482814, E-mail: gensec@rsars.org.uk or visit www.rsars.org.uk



The Medium Wave Circle

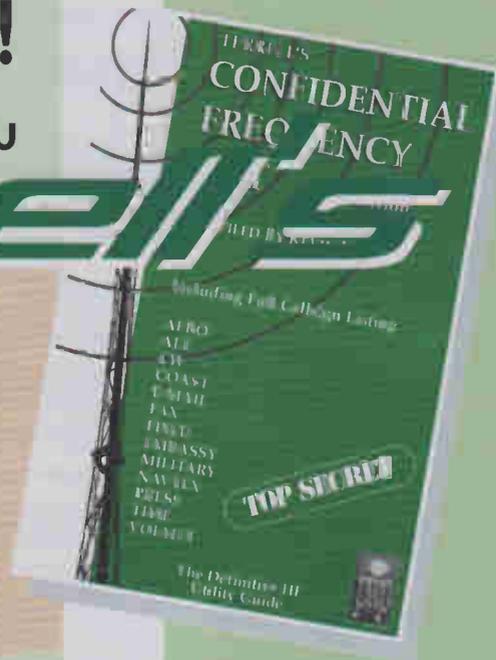
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Scanning Scene

- **Dave Roberts** *do SWM Editorial Offices, Broadstone*
- **E-mail** scanning@pwpublishing.ltd.uk

Isn't it amazing what turns up on the second-hand market these days? Amateur radio rallies and gatherings are always worth a mooch just to see the second-hand 'junk' on sale.

I recently attended a rally in Cambridge and came across some Pye/Philips PFX type radios. For those of you unfamiliar with these units they are hand portables, usually grey in colour with 99 channels. The sets in question were on u.h.f./f.m. and featured encryption. Now that fact alone always makes them interesting. Further investigation found them to be channelled as follows:

Channel	TX (MHz)	RX (MHz)
1	449.675	443.575
2	449.925	443.675
3	443.525	443.525
4	443.575	443.575
5	443.675	443.675
6	448.025	442.225
7	448.625	442.475
8	442.625	442.625
9	442.475	442.475
10	442.925	442.925

Channels 1 and 2 have been used in the past by the Ministry of Defence (MOD) Police and obviously Channels 4 and 5 are the simplex versions of the first two. The MOD police used to have a plethora of hand-held radios made by Cleartone so these may not have originated from this source. In any case the MOD Police frequency used by nuclear convoys does not appear to be included.

The ambulance services use 442.225MHz but I don't have information to hand on the other frequencies loaded in the radios, which are now converted to the 70cm amateur band, but could they still be in use somewhere? If these radios have come from an official source one can only ponder the wisdom of allowing them to hit the amateur market without having had their eeproms wiped first.

There doesn't appear to be a mass of information about specific users of the 448 and 449MHz bands. If you happen to reside in a built-up area, these frequencies may be worth a search.

Also at the same rally some Racal h.f. sets were on sale. I don't have further details on them but they were allegedly 100W radios, without encryption. The rumour around the rally was that they had come from 'Nuclear Trains'. I don't know anything about nuclear trains at all - I lost interest when they stopped

running 'em on coal and water!

More equipment goes on the market everyday. I've noticed some German military SEM52 portable v.h.f. sets. These radios run on AA pen cells and those that I've seen for sale have the following channels fitted: 47.950, 48.950, 54.950, 55.100, 47.800 and 55.500MHz.

The SEM52s are f.m. sets. Now someone, somewhere in the UK is going to be using them. Who'll be the first to hear them on air? I wish I could afford to offer a prize...!

Glass Mount Antenna

My experience with the glass mount antenna that fell off my car (*SWM* March 2004 'Scanning Scene') prompted **Peter Longhurst** to drop me a note. Peter has a fair bit of experience with antennas, as he is the proprietor of **Garex** and **AKD**. In a past life he was an industrial chemist. All-in-all he's just the chap to know about this sort of thing.

Peter writes: "The cleaning fluid sachet issued with the antenna is usually based on iso-propyl alcohol. The window contaminants are likely to be oil, plus wax and silicone from polish, as well as assorted dirt. Not much of which is soluble in alcohol. I always recommended using a powder based household cleaner. JIF was the favourite and we used it by the gallon to clean up old radios, JIF has been reformulated and renamed 'CIF' and does not seem as suited to this purpose as its predecessor. Another problem is that the adhesive in the pads needs curing time to reach full strength, up to 72 hours at moderate temperatures and much longer in the winter. A sunny day or a warm garage would help. The vehicle should not be driven during this time (or at least detach the whip). The pads also have a finite shelf life. The other thing to watch for is slight curvature of the glass as you don't get 100% contact".

Thanks for that Peter, your advice could save people experiencing the 'drop out' that I suffered.



GCHQ Scanner

A couple of months ago I mentioned Her Majesty's Government's own scanner also known as GCHQ. Since 1952 the staff working there had been housed in two separate sites on either side of Cheltenham.

Long overdue for some decent office accommodation they have finally moved into their new premises at Cheltenham. Costing £330m it's a large circular building with a hole in the middle that provides garden space. Not surprisingly the building is known as 'The Doughnut'. Staff now enjoy vastly improved working conditions over the old sites. The ground floor consists mainly of computer suites with office accommodation above. The whole place is designed to promote a feeling of community within the workforce and to encourage the staff to talk with one another in order to share ideas and information.

Following the example of similar facilities in the USA, The Doughnut has a 'main street' with shops and a 600 seater restaurant. Specially designed to withstand a terrorist attack and with its own electricity generators the new premises provide the staff with a fine working environment and the UK with a first class intelligence facility.

So, what's this got to do with scanning? Oh yes, they have an MPT1327 trunked system on site, working on 453MHz. You won't hear any secrets on it but any building of this size needs maintenance staff to be instantly deployable and that's why they need two-way radios.

As you may be aware, there is a moratorium on the licensing of new repeaters and packet nodes on the amateur 70cm bands. I thought that was a place where they held concerts but it means they are stopping the issue of licences. The rumour is that this is due to the deployment of US forces in the UK during the latest war on Iraq. It seems that the B52 support crews may have been using radio equipment that suffered interference from 70cm amateur transmissions while they were deployed at Fairford.

American ground crew and maintenance staff used to use frequencies in the 400MHz area. More specifically, 410.600, 410.900, 411.150, 413.075, 413.125, 413.175 and 414.150MHz (all n.b.f.m.), were operating from the now defunct Upper Heyford base. Could these or similar frequencies be in use at Fairford when the radio equipment together with the technicians, is flown in?

In the January issue I wrote about growing interest in 'Warring' or 'War Driving'. This is the practice of scanning for Wireless Local Area Networks (WLANs) and then using them. In some areas the antennas used for distributing the signals are discrete and in other places they are rather easy to spot.

Martin Briscoe kindly sent me the picture shown here of a WLAN antenna. Even if you are not interested in this activity, being able to identify such antennas can be useful to those of us who are generally interested in radio.

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