

**Issue 160**

**January 2008**

**ISLE OF WIGHT PC USER  
GROUP**



# **HOT KEY**

**WINTER 2008**



Richard showing the Power of Genes program

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# The Isle of Wight Personal computer User Group

## The Isle of Wight PC User GROUP

Welcomes all owners and users of IBM compatible Personal Computers.

It is a group which seeks to exchange ideas and new information.

Our meetings are held on the first Wednesday of each month at **The Riverside Centre, Newport** from 7.30 to 9.30 pm

*Visitors are welcome. Membership is £6 per annum*

**A charge of £1 is made per meeting, which includes tea or coffee during the break.**

**If you would like to know more about us, you are most welcome to come along to one of our meetings, or you can contact one of our Committee Members listed on page 3.**

The Club Website address is **[www.iwpcug.org](http://www.iwpcug.org)**

We also have an e-group discussion area

Yahoo iwpcusers: **[iwpcusers@yahoo.com](mailto:iwpcusers@yahoo.com)**

See page 5 for how to join

## FORTHCOMING EVENTS

<u>Date</u>	<u>Subject</u>	<u>Speaker</u>
6 February	AGM; Open Street Map	David Groom
7 March	Linux	David Groom

See our Website for more information as it becomes available

## ISLE OF WIGHT PC USER GROUP COMMITTEE MEMBERS

**Chairman:** David Groom

**Vice-Chairman:** Cliff Maidment

**Treasurer:** Bob Groom

**Secretary:** Susanne Bone

**Membership & Database Secretary:** Ray Boote

**Committee Member:** David Broughton

**Committee Member:** Roger Skidmore

**HotKey Editor:** Bob Groom ( as above )

[Contact details removed prior to published on internet]

Suggestions for new events, topics or speakers for talks are always  
welcome.

Please contact any committee member with your ideas.

If necessary we may be able to find a speaker for your subject.

## **NOTICE OF AGM**

Notice is hereby given that the Annual General Meeting of the Isle of Wight PC User Group will be held on Wednesday 6 February 2008 at 7:30 PM at The Riverside Centre, Newport. Nominations are requested for the positions of: Chairperson, Treasurer, Secretary, Membership Secretary, and up to eight other committee members. Please send your nominations to the Secretary, Su Bone. Seconders are not necessary at this stage.

### **ISLE OF WIGHT PC USER GROUP ANNUAL GENERAL MEETING AGENDA**

1. Approve the minutes of the previous AGM, held on 7th February 2007, (copies available from <http://www.iwpcug.org/secure/agmmin07.htm>)
2. Matters arising from the minutes.
3. Receive reports:
  - 3.1 Chairman
  - 3.2 Treasurer, including approval of the Club Accounts
  - 3.3 Secretary
  - 3.4 Membership Secretary
  - 3.5 Other activities: Computability, HotKey, Library, Cover Disk, Website, Egroup, Marketing, Riverside Liaison
4. Elect a new Chairperson, Treasurer, Secretary, and Membership Secretary.
5. Elect other new Committee members (up to a maximum of eight persons).
6. Set the Annual Subscription.
7. Appoint an Independent Examiner
8. To consider, and if appropriate approve amendment to paragraph 7 of the Constitution (See note below).
9. Any Other Business

## **Note Regarding amendment to paragraph 7 of the Constitution.**

The current wording of paragraph 7 is:

7 The Committee should meet at least once each month. The quorum for a Committee meeting shall be four persons.

It is proposed this is changed to:

7 The Committee should meet at least once every two months. The quorum for a Committee meeting shall be four persons.

Reason for change:

With the increasing use of email it is not thought necessary for the committee to physically meet each month. Committee members also tend to see each other at the monthly members meetings. Currently however the committee are required to formally meet each month irrespective of whether there is a real need to do so.

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## **HOW TO JOIN THE E-GROUP**

Send a blank e-mail to: **[iwpcug-subscribe@yahoo.com](mailto:iwpcug-subscribe@yahoo.com)**

All members are encouraged to join this e-group (which costs nothing and is private to all club members) in order to keep in touch with events and join in with discussions.

You can also keep in touch by regularly visiting **[www.iwpcug.org](http://www.iwpcug.org)**.

## **FTP - File Transfer Protocol**

FTP is a commonly used protocol for exchanging files over any network that supports TCP / IP, regardless of which operating system is involved.

There are two computers involved in an ftp transfer, the server and the client. In order to connect to the server the client needs its address, and typically this will be in the form of ftp.mysite.com. Once connected the client can do a number of file manipulation operations such as uploading files to the server, downloading files from the server, renaming or deleting files on the server etc. In most cases the server is password protected so that only those with a specific username and password can perform these operations.

It is the main method used for uploading files from a local computer to the internet for later viewing over websites, and a number of web design packages such as Dreamweaver and NVU have their own ftp client built into them.

Assuming however that you don't have one of these packages what is your choice? Wikipedia lists 50 different ftp programs, many of which are free, and more of this later.

The majority of you however will already have an ftp client on your computer, admittedly however it is limited in use. The most basic ftp client is already built into Windows. Open up a command prompt window and type 'ftp' (without the quote marks) and the prompt will change to ftp> . You are now running the DOS ftp client! Type 'help' followed by carriage return and will see a list of commands available. Most of these I am afraid will be meaningless, so simply type 'quit' to exit the ftp client. I merely mention this method for two reasons, firstly to show you how basic ftp can be, and secondly just in case you ever need to ftp and it appears there isn't a client on the computer then your memory might be a jogged into remembering this article. (Should you wish more information about the commands available then see [http://www.techscribe.co.uk/ta/using\\_ftp.htm](http://www.techscribe.co.uk/ta/using_ftp.htm)).

A more user-friendly ftp client is built into Windows Explorer. If you open Windows Explorer and type an ftp address into the address bar it will attempt to connect to the server. If necessary you will be prompted for a user name and password, with the option of having these remembered so you don't have to type them in again. The ftp directory on a server appears in Windows Explorer as any other local directory, and you are re able to copy files between your local computer and the server, delete files, or rename them.

However I'd recommend a purpose built FTP client, and currently I like the look of Filezilla (<http://filezilla-project.org>), which is free. One reason why I particularly like this program is the ability to set up filters so that only certain classes of file get displayed in the client.

Those of you who use Firefox might be interested in downloading the FireFTP plugin, which causes an FTP client to appear in the main Firefox window. One nice feature of this piece of software is the toolbar option to compare the local and remote directories, which quickly allows you to identify files, which are not in sync.

David Groom

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## **CHAIRMAN'S REPORT**

A happy new year to you all. In February it is the club AGM, and I hope to see as many of you there as possible. As ever we are looking for new blood to come on to the committee and it would be nice to see one or two new members coming forward to join the long standing committee members.

I will be giving a Chairman's report at the AGM so will not dwell too much here on the past year other than to thank the committee for the time and effort they put in, and to thank our monthly speakers, without whom a full programme of events would not have been possible.

This month's cover disk continues to update the utilities and freely available programmes which have featured on previous discs. During the year I had wondered whether the provision of a cover disc fulfilled any useful purpose given the preponderance of broadband and the ability of people to download their own programmes. However just last week I found myself searching for a cover disc to install programs on a computer which was not connected to the internet, and I realised what a handy repository our CDs are. We do try and put something new on each issue, and welcome suggestions of software we can use.

I'm pleased say that we have speakers lined up for the first few months of the year and hope that this position will continue throughout 2008.

David Groom

Chairman

# THE POWER OF GENES

## Synopsis of the October 2007 Talk

Charles Darwin first realised that variation within a species leads to survival of the fittest and that this advantage would be inherited by the next generation, thus endowing offspring with their parents' physical benefits. We now know that genes are responsible for coding this information and it is held in a digital fashion. We also know that parents' genes are combined to produce a hybrid and that genes can mutate.

We can use these ideas to solve a variety of complex problems in computer models. These models are each constructed in a similar fashion, although the types of problems can be very different in scope. To begin with, a random population of genes of say 100 is generated, each describing a different solution to the given problem. Then each of those is given a score within the model detailing how well that gene performs the allotted task. Next, a large fraction of the genes are culled, leaving only those survivors that are fittest. These survivors can then be combined in various ways by swapping parts of their genes with others, as happens in the real world. At the same time, small mutations are introduced to give the possibility of new approaches to the task in hand. This is the next generation and enough such genes should be produced to replace all those culled. The entire process is then repeated until a suitable solution is reached.

The first example is the Travelling Salesman (TS) problem. The TS has to visit 100 cities by travelling to each one once and ending up back at the start. This problem cannot be tackled by analysing each possible route, as there are more than  $4 \times 10^{155}$  (4 followed by 155 zeros) and would take much longer than the age of the universe even on a Cray. The model demonstrated was written in C++ and DirectX, although any language would be suitable. The genes are simple – they consist of 100 integers describing the route to be taken (e.g. 50,33,2,5,...). The fitness test is also straightforward: simply calculate the distance travelled. The standard recipe is followed: create a random set of routes, find the best 5% (say), breed and mutate from those and repeat until nicely done. The model graphics quickly demonstrate that good looking solutions appear within a minute or several tens of thousands of generations, but it should be emphasised that the perfect solution is not guaranteed by this method. In the real world, this approach can be used to program a robot to drill and solder its way around a printed circuit board, where the component positions replace the cities. The model demonstrated graphically that the approach is easily adapted to cities whose positions are in 3D space.

The next example was also written in C++ and DirectX. It was set up to design a garden maze genetically on a square grid. Here, the genes are simple binary codes to express whether an area is covered by hedge or not. The fitness test (FT) is more complex as it has to calculate a variety of attributes which are required for a good looking maze. The FT has to calculate how many areas are inaccessible, where long stretches of straight corridors exist, facts about disconnected pieces of hedge and how far into the maze is the longest possible path. These sorts of factors can be modified to produce a maze which is more pleasing to the eye, by awarding various positive and negative weights to



each attribute and summing them all up for each gene. The Darwinian process is set in motion and nice twisty mazes which are very difficult to navigate arise. At this point, a walk-through can be shown in the model where the user travels the maze in a 3D environment. DirectX texture mapping was used to project JPEG images of the IWPCUG Committee onto the walls of the maze (see front page of HOTKEY). The speaker apologised in advance for any nightmares that might occur as a result. \*\*\*

An engineering case was demonstrated after coffee. Here the problem posed was to stretch a membrane or skin over two parallel circular hoops using the minimum amount of material. This model was written in Java 3D as an applet which makes it suitable for display on a web page. This time the FT is easy – calculate the surface area for a given gene. The gene itself is more complex as it has to describe many hundreds of (floating point) measurements, given as distances from a central spine. The model allows for a variety of resolutions so that smoother solutions can be reached at the expense of extra computing time. The model was then demonstrated with a assortment of loop shapes – squares, ellipses at various orientations. Mouse movements can manipulate the 3D model to show the object from any viewpoint. It is important to note that the same underlying Darwinian process is at work in all these computer models.

Lastly an illustration from game theory was shown, written as an applet in standard Java. This is the famous “Prisoner’s Dilemma” (The rules can easily be found on the internet). An iterated or repeated version is used to investigate the outcome over a large number of encounters. The prisoners are arranged in a grid where they pit their strategies against their neighbours. This time the gene describes a strategy, telling an individual exactly how to play the game in any given circumstance (surprisingly, only 18 bits per gene are needed). The FT applies the rules of the game to a pair of neighbours and the winner is decided. The winner overwrites his neighbour’s genes with his own in a very warlike manner, with the chance of a small random mutation. In this manner, strategies are tested against others, with the best ones spreading. The graphics show a pulsating scene of colour blocks as strategies battle it out, each colour representing one of 262,144 possible approaches. A lively debate ensued as members looked for parallels with the real world of humans hidden in this virtual world.

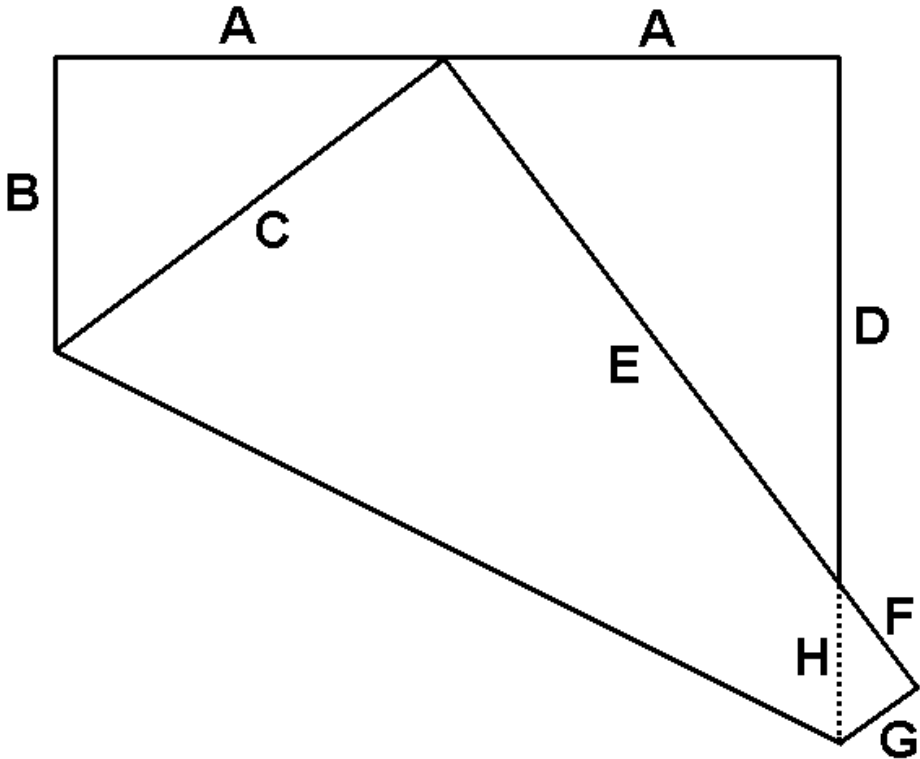
Hopefully, members will see that this genetic approach can be used to tackle a wide variety of problems where conventional methods might not be suitable. After all, it has worked in the natural world very successfully for billions of years here and probably all over the universe.

Richard Burkill

\*\*\* There is more about this MAZE program on page 14

And a positively awful coloured picture of your Editor on the back page !!

## DAVID'S PUZZLE



This Diagram shows a square piece of paper folded so that one corner touches the centre of an opposite side. The letters A B C D E F G H are the dimensions of the various edge parts and all are integers ( whole numbers ) in whatever units you care to use.

What is the smallest lengths for these eight dimensions ?

Please send your answer to me, David Broughton, ( see page 3 for address ) to arrive by 6th Feb 2008.

## DRIVERS

In the computability project we usually configure a newly donated computer by replacing its own hard disk with "one we prepared earlier" containing a working installed version of Windows 98 and a suite of shareware or freeware programs. What happens when we switch on is that the system boots (usually) and starts to load Windows. It then goes through a series of hardware checking procedures during which it appears to find drivers for the particular hardware which it is presented with. After several reboots we find ourselves with a working installed version of Windows but normally the video is in basic chunky VGA mode, the sound isn't working nor the modem - but everything else appears to be.

The hunt is then on either to find drivers for these three items, or replace the fitted cards with ones for which we do have drivers. Where the hardware is integral to the motherboard it is often possible to find the motherboard manufacturer's site and download the appropriate drivers, otherwise we find the best site is Driverguide ([www.driverguide.com](http://www.driverguide.com)).

The drivers come in the form of either an executable file which does all the work for you, or some other system file which you have to install from Windows' hardware manager. We don't always succeed, so some of our systems go out without sound enabled, and often fitted with new PCI modems - which can be bought for about a fiver. Video drivers seem to be more successful so all systems go out with basic SVGA video working.

To help with the mystery of hardware drivers, the following is taken from the Driverguide website:

What is a Device?

In computer terminology all the electronic devices like Mouse, Floppy Drive, CD-ROM, Monitors etc. that are attached to the CPU (Central Processing Unit) are called "Peripheral Devices" or Simply "Devices." Each of these devices has a special "Protocol" to interact with the Operating System. You can see the list of devices by right-clicking the

"My Computer" icon, selecting Properties, and clicking the Device Manager tab.

What is a Device Driver?

A device driver is a program that controls a device. Every device, a printer, disk drive, keyboard, etc. must have a driver program, to interact with the Operating System. The driver is a piece of software that lets the PC talk to peripherals, components, and other hardware. It interprets Operating System commands to the specific needs of the device.

How Does the Driver Work?

A driver acts like a translator between the device that it controls and programs that use the device. For example, a mouse driver translates the "actions" of the mouse to something more understandable by the Operating System. Each device has its own set of specialized commands that only its driver knows. The driver, therefore, accepts special commands from a program and then translates them into specialized commands for the device.

Roger Skidmore ( Computability Project )

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### **SPOT THE DIFFERENCE**

I had wondered for a while whether it is possible to use a computer to solve the spot the difference image puzzles which you get in magazines such as the Beacon.

In theory the answer should be yes, however as I detail below, in practice it is not necessarily so easy.

I used Adobe Photoshop, but I believe the same results can be obtained using Paint Shop Pro. To test the principle I created an image, selected all of the image and copied it to another layer. I then changed the blend mode for the layer from "normal" to "difference". As the two layers were exactly the same the result is a completely black image. I then made a slight alteration to one of the layers, applied the difference blend and noted that where there was a difference, this stood out like a sore thumb.

It was now time to try this on a real spot the difference competition. I scanned the page of the magazine which contained the two images (call them image A & B). I then drew and a selection window round A, copied that selection and pasted it as a new layer (call this C). I then moved C to superimpose it over B, and this is where my problems started. Either due to the way the two images were originally laid out on the page, or due to slight inaccuracies in the printing process, the dimensions of the two images were not exactly the same. Therefore when I tried to apply the difference blend to the two layers there was a mass of differences. I tried for a long while to rescale, rotate, and otherwise modify C so that it superimposed exactly over B, but had no luck.

I decided that maybe I was being too adventurous in trying to look at the whole image in one go. I therefore moved C as accurately as I could over B using the mouse. I then zoomed in to look at the top left quarter of the image - there were, as I expected, lots of places where the two images appeared different. However using the cursor keys I was able to move image C one pixel in any direction, and through trial and error using such small movements I was able to identify areas where it was impossible to remove a difference. These areas were in fact real differences between the two original images. All I had to do now was move to a different quarter of the image and repeat the process.

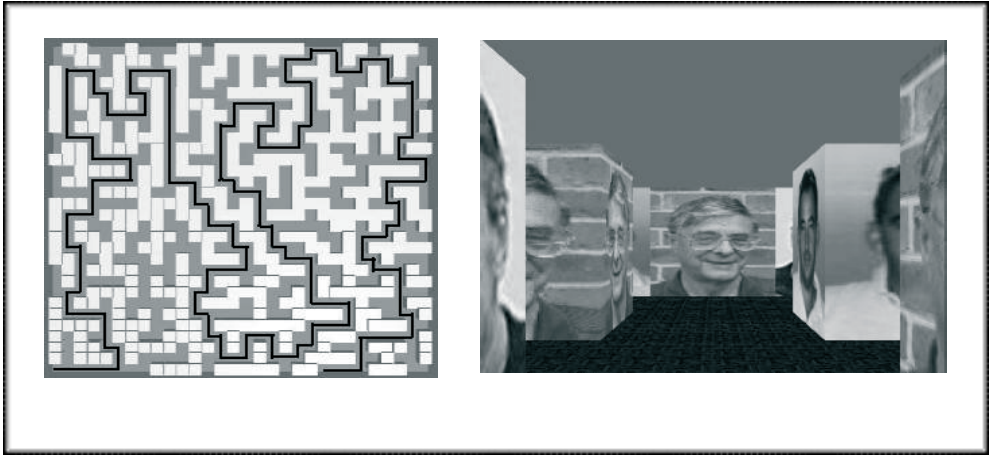
I'm not sure what the above proves, but it gave me half an hour of fun.

After I wrote the article above Su Bone suggested that copies of the competition might be available on the Beacon website. I had a look, and in fact complete pdf's of each edition are available for download. Having downloaded one of these I was able to copy the images and paste them into Photoshop. After performing the difference blend the six differences immediately leapt out. There was none of the distortion between the two images that I referred to earlier, and there was no need to manually locate one image above the other as they were an exact match.

I hope to include on the Cover Disk a video of me demonstrating the two methods.

David Groom

I would like to thank our new member Richard Burkill for his contribution to this edition. We really do need some more contributions. There must be some of you that have something interesting to tell us about what you use your computer for . Ed.



### The AMAZE program

The pictures above show two stills from the “Amaze” program, the first being an aerial shot, the second from within the bowels (no offence intended!) The configuration shown is quite unique and took less than a minute to calculate on a 1.5 Ghz processor after 10000 generations of a genetic algorithm.

The purpose of the program is to create a maze on a 30x30 grid composed of binary blocks – a block is either present or not on any particular square. Amaze is attempting to design a maze that has all the features that an interesting maze should have such as twisting paths and no areas that are inaccessible. It also weeds out mazes that have isolated blocks or too many long straight stretches. These are characteristics that can all have a value attached to them so that individual genes can be measured against each other. One of the most important features is that there should be a very long route within the maze, as above, where the path shown is the shortest available.

Genes are randomly set up at the start composed of 900 bits to represent each position. Each gene can then be measured to calculate how good a maze it produces. Initially, most genes are very poor at their assigned task and are mercilessly killed off whilst keeping their better scoring siblings. (Try not to think of these genes as living in the real world – this is just a computer model!) The best ones are kept, cross bred and randomly mutated in a blind attempt to produce a better result. Remember that each gene is an array of bits, so they are easily manipulated

The algorithm for finding a route around the maze is interesting. Only consider squares where there is no hedge and assign each a value of -1. Beginning at the bottom left, change the first square to 1. Consider each square of value -1 that touches it and change their values to 2. Then look at the squares of value -1 that touch these value 2 squares and give them a value of 3 and so on. In this way it is possible to find the most inaccessible part of the maze, which is the square with the greatest value.

The drawing is performed by DirectX, which simply has to draw a block where the gene specifies it to do so. Texture mapping is used to add the very attractive wallpaper.

Richard Burkill

## THE INTERNET AND WEB

Over the last few years with the World Wide Web and the Internet we have seen some absolutely incredible developments. From its original conception as a means of transferring information between US universities and government departments it has become a communications system that has had profound effects our society.

Now, email has almost taken over from letters and phone-calls. There are email “groups” for almost any conceivable subject, where members can exchange experiences and opinions.

We can trace old friends and our family history and ancestors back through many generations. Using “ News Groups” we can discover and exchange information, again on any subject under the sun !

Web-sites like blogs, facebook, youtube and personal web-pages have become a fantastic means of meeting thousands of other people ( Some that you would prefer not to have met ! ) Chat- rooms are now used by thousands of members. With the wide bandwidth now available remote controls are becoming commonplace. We can access our home alarm system, control and monitor security cameras and turn on or off our central heating system from anywhere in the world. Now, of course, this can frequently done via a mobile-phone !

As a Radio Amateur, I can access and control any of hundreds of sophisticated receivers which have been set up and made available by Amateurs all over the world, so I can tune in to stations in any particular location. If I were transmitting and wanted to know how my signal was being received in Madagasca, I'm sure there is a receiver there that I could access. ( often after waiting in the queue ! )

Internet shopping has really taken off with all major stores and hundreds of family businesses on line. Ebay handles practically any sort of product and has an enormous throughput of goods.

With the sort of high security now available Internet Banking is now fairly common and Income Tax returns are accepted by the Inland Revenue.

Most service companies ( gas ,water,electricity, insurance, telephone,Insurance etc. ) now seem to prefer payment via the net.

Highly complex games can be played with single or multiple opponents anywhere on the planet ( at least those games where the time-lag is not important ) Many thousands of computer programs ( many “freeware” )can be downloaded for almost any type of application.

There is a remarkable site now called ( I think ) SecondLife, where one can assume some other Identity and control what happens to one in a sort of 3 Dimensional “ other world ”. Fantastic realism seems to be available.





He could have chosen someone a bit more handsome !!

← From previous page

.Sound and Vision can be “streamed” and many local radio and television stations are available on the Net, some in “real-time” some recorded. In a radio magazine that I take monthly, a few issues ago it was suggested that “sound broadcasting” as we know it, will, except for local stations, eventually be abandoned in favour of Internet Radio. Depending on which estimate you believe, there are currently between 4000 and 8000 stations available. To receive these stations it is not necessary to have a computer, there are quite a few dedicated Internet Radios on the market from around £90 to £200. Unfortunately there is no standard coding used and names like “shout-cast”, OggVorbis (originally designed for Linux) WM3 MP3 Wav, and a few others are used and some of the cheaper radios can only receive a few of these. The BBC uses Real Audio, which is not supported by some of the cheaper sets.

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