Olinda


Select
Tuning
Most listened
All stations

Olinda is a prototype DAB radio that shares listening with friends, is customisable with modular hardware, and aims to provoke discussion on the future and design of radios for the home.

Olinda is by BBC Audio & Music, with Schulze & Webb.

Welcome to Olinda. This prototype has been created to provoke discussion on the future and design of radios for the home.

There are certain avenues it explores: using social features to enable station and programme discoverability and spark conversations is one; to ease retuning so that a form of 'mixed programming' arises is another. Yet another is modularity. All have been successfully explored on the Web: Web users have enormously varied, social experiences online, and websites build on and incorporate one another.

It's time to see whether these same features can work in consumer electronics (Olinda's usage is outlined on the next spread, followed by design notes which discuss functionality in more depth).

In particular, the radio responds to certain trends, including the Generation C urge to have social connections in their products, which themselves can be modified and extended. Confronted with the growth of this newly design-literate audience, used to MySpace and the amateur creation of goods and media, how can we demonstrate to them the value of broadcast radio? There is more about Generation C in the 'Background' section at the back of this book.

Olinda also limits itself: the radio receives DAB broadcasts only. There is capability to receive streaming internet radio; we feel the form of navigation and discoverability required to deal with many thousands of stations is sufficiently different from exploring DAB broadcasts to deserve its own, separate work.

Further, Olinda has an assumed context: this DAB prototype is intended to sit alongside the television, games console and stereo as a piece of living room entertainment. It is positioned for the Generation C audience, and secondarily for the non-core radio audience—it has a simplified interface which should appeal.

To achieve these aims, two key technologies are introduced:

- Networking: the sharing module of Olinda includes a wifi card, to make use of any wireless internet connection present.

- Modularity: there is large connector on the side of the radio, a 'hardware API' to allow functionality to be added as further modules.

While these technologies are used minimally in Olinda, they have much potential. The bulk of this book is devoted to design concepts arising from each.

At a higher level, Olinda has multiple aims:

- We aim to treat radio owners not as listeners but *hearers*. A hearer is an active participant in a broadcast, discussing and reacting to the radio with other hearers, more like an engaged audience sitting together, instead of isolated listeners all consuming radio independently from one another.
- Olinda aims to start conversations: the radio should make a person's friend ask about it when they enter the room. It should prompt a listener to deepen friendships by giving opportunities to listen to the same programming.
- And the radio, we hope, will trigger conversations among those reading this book, on what's right, and what's wrong, and what could be done differently to this device, Olinda, and in the DAB industry as a whole. (See the Licensing section for some more implications of this.)

To that end this book makes an effort to identify relevant trends, drivers and influences, and include commentary on the design decisions in Olinda and its surrounding, supporting infrastructure.

We hope this project provokes as many thoughts for you as it has done for us.

Friends

The best recommendations come from friends. And media itself is the start of many conversations, either because people experience it together and feel closer, or because they use it as an prompt to start an interaction.

Knowing this, and the success of social features on the Web, Olinda furthers the capability to share listening with your close friends and family. Really it's just a background awareness that a friend is listening to the radio… but look closer and you can see the station, and maybe retune to join them. The next day, when you see them, you have a little more in common.

Modularity

On the side of Olinda is a studded, magnetic connector that allows extra modules to respond to what the radio does, or control it in new ways via instructions sent over this hardware interface. The social listening module, included, is created in this very way.

While Olinda has no clock and no presets, the door is left open for a third party to make those modules. Perhaps it'll be a hobbyist who creates one of those modules, one of the new generation of consumers who expects products to connect to one another, and to participate in their design.

Experience & design

Olinda is primarily aimed at young, design-literate opinion-formers. Secondarily, the simplified interface appeals to the non-core radio audience.

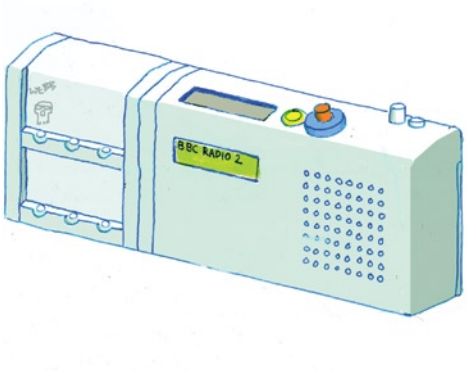
Instead of presets, which require choices, Olinda presents the most listened–to stations within the standard list in an integrated tuning dial.

Drawing from observations of the physical experience, where a listener can see the front of a radio when across the room, but only the top when tuning it, Olinda has two screens.

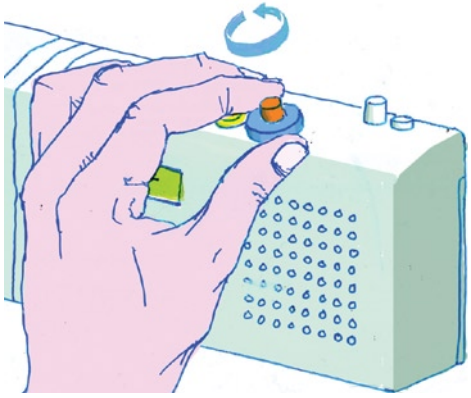
In such ways, the design is based not on the features list of the radio, but on the motivations and experience of the people using it.

Example usage

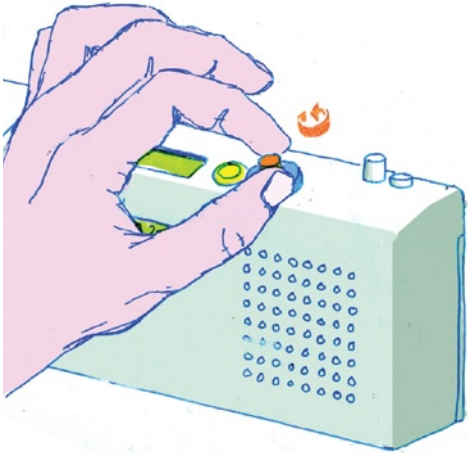
Olinda in its customary pose: the radio is on and tuned in, with the station currently playing on the front screen, displayed to the room. While it sits there, the radio monitors what it is tuned into and remembers the most popular stations. Otherwise it's like any other DAB radio.



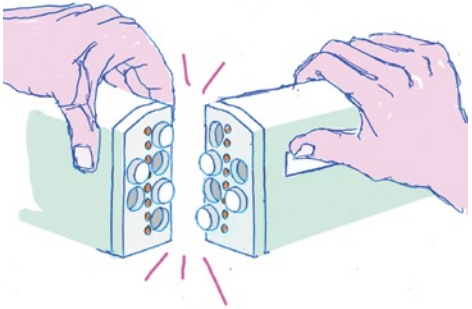
To see the available stations in alphabetic order, our listener scrolls through the list by turning the outer ring of the tuning dial, which clicks frequently as it turns. These stations are shown on the interface screen, facing up.



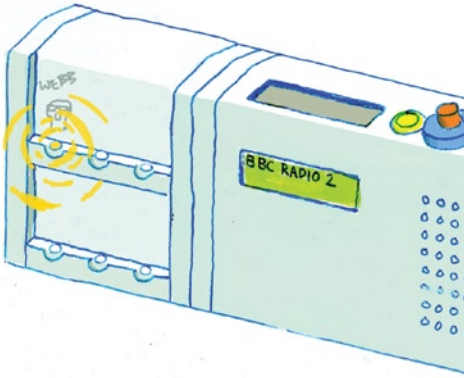
The tuning dial has a smaller, inner section too. Turning the inner dial doesn't show every station, only the ones most listened to. The clicks as it turns are less urgent. To tune to a station, our listener taps the 'retune' button.



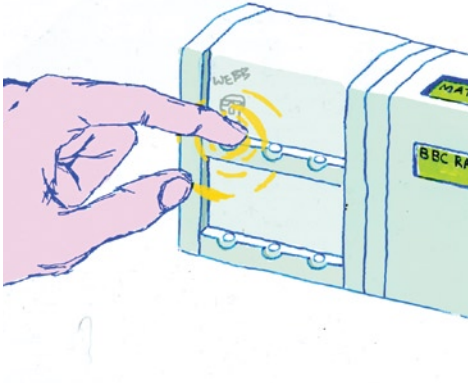
On the side of Olinda is the ‘hardware API’: seven bumps with sprung connectors carrying power, audio and control codes. New modules fit on with a clunk, and are held by embedded magnets. They also pass on the hardware API so modules can be daisy-chained together.



This module shares listening with up to six friends, using a central website, and our listener has written on the white-board-like surface to note which friend corresponds with which light. The friend has turned on their Olinda, and their light turns on!



Our listener pushes the light on the sharing module—the light is embedded in a button. Just as when tuning, the station their friend is listening to shows up on the interface screen. It looks like an interesting station, so with a tap of the retune button, it begins to play.



Design notes

1 Display (main screen): The display screen faces into the room, and always shows the station now playing. When interacting, the listener looks down at the interface screen, which shows options.

2 Tuning (outer dial and retune button): The tuning knob has inner and outer dials, which have fine and coarse stepped tactile feedback. The outer dial scrolls through stations alphabetically.

3 Most listened (inner dial): Turning the inner dial shows the most listened to stations on the interface screen; the 'retune' button is pressed to select one.

Technically...

4 Hardware API: The large bumps have smoothed edges for guiding a module into place, and embedded magnets to hold it. Sprung copper pins in the small holes make the electrical connections.

5 Sharing module: The sharing module sends 'now playing' information over wifi to the BBC's social listening Web service every few minutes, and retrieves information about friends too.

6 Friend indicator (light, button and adjacent surface): The light shows that a friend's radio is on. It can also be pressed to show the station on the interface screen. The module's surface is like a white board, for names and annotations.

Sharing module: Inside the sharing module is a wifi card, which can join a local wireless internet connection. To avoid using the radio to configure the wifi, it offers just one commmand: reset. This makes the wifi card start a new network and run its own configuration website. The listener can visit this website to configure the card to join their home wifi network.

Similarly, the listener uses the BBC's social listening website to choose which six of their friends occupy which slot on the social module (a friend will always appear in the same slot, to allow for familiarity and annotation).

The social website protocol is simple, to allow for input from many sources such as online radio players and other devices.

Hardware API: Carried over the hardware API are: the power supply; audio; an on/off signal; and the communications connection itself. Once a module is hooked into the communications connection(which runs on a protocol called I^2C), it may query the radio's base unit for data, such as what's playing right now, and push messages onto the interface screen.

A module connects to the base unit on one side and offers out the hardware API on its other; modules may therefore be daisy-chained together.

The sharing module makes use of a command on the DAB chip called 'offer for tuning', which takes a unique station ID and shows the name of that station on the screen. The listener may then push the retune button to tune in.

Network

Here we show early design concepts for what can be created when consumer electronics can take internet access for granted.

A number of trends point towards network connections becoming commonplace in products:

- **Generation C:** A new generation of consumers demand a different relationship with their products. They want to modify them (and make products themselves); they want products that are social and fit into their communities; they want their products to connect to one another. This isn't necessarily the concept of 'convergence'—just that data shouldn't be locked into a single plastic shell, and electronics in the home should at least be able to work together and with other devices over the internet.
- **Ubiquity**: While wifi is not yet ubiquitous, for a certain type of home it can be assumed to exist. Its popularity will grow. And as the use of wide and local wireless networks (the internet over wifi, and Bluetooth respectively) grows, so the cost will fall, making it cheaper to include a network connection for increasingly incidental features.
- **Smartness**: Coupling a device with features hosted on the internet means that the sophistication of the features can evolve over time, without having to consider the constraints of the device itself. A network connection means that information can be live, or come from a much larger, richer dataset, or imbue the device with smarts that need more computation power than that present in a radio. Moreover, the service offered can exist beyond the device itself, moving to the most applicable platform for any given interaction: the technology doesn't make the product harder to use, but offers new simplicities.

As more products take up a connection, products that don't make use of one will appear mute.

What could a wireless network connection be used for?

- Drawing on live information.
- Comparing a user's behaviour with their friends or a large group of people, in order to offer recommendations or a social connection.
- By using a local connection to a mobile phone perhaps, identifying the user as one among many in a household.
- Connecting with other local devices.
- Offering a different or more powerful interface on a computer or anywhere on the Web.

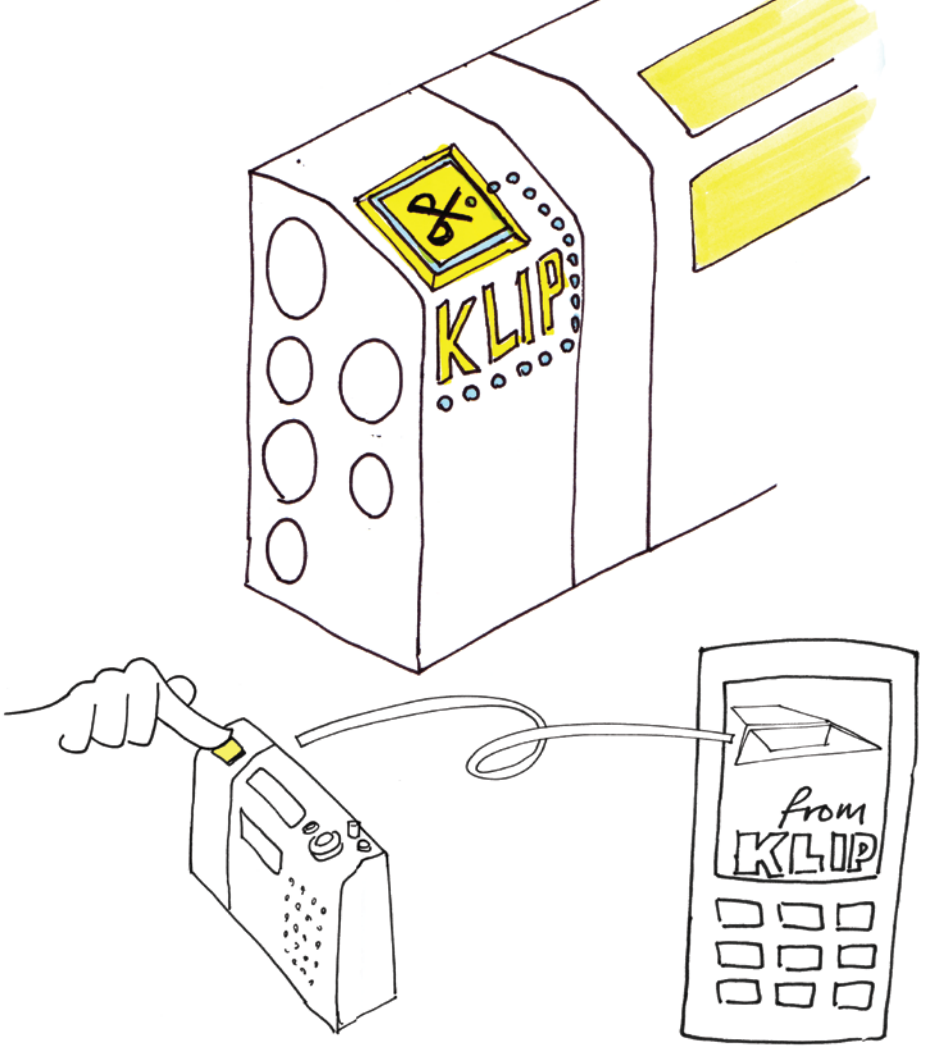
So far, the network has been discussed only in relation to consumer electronics in general; the applications to radio add an axis to the range of programming and interaction possible.

Olinda uses the network connection to aid discovery—drawing on the success of social software on the Web in discovery, recommendations and sharing—but where do we get to when we can start treating programme makers and advertisers as part of the community surrounding a listener's radio experience?

A few possibilities follow:

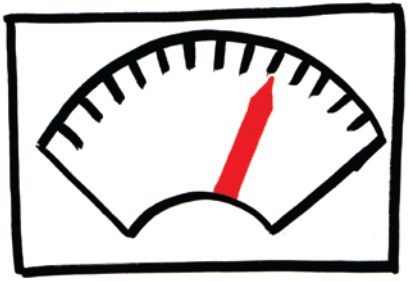
Klippit

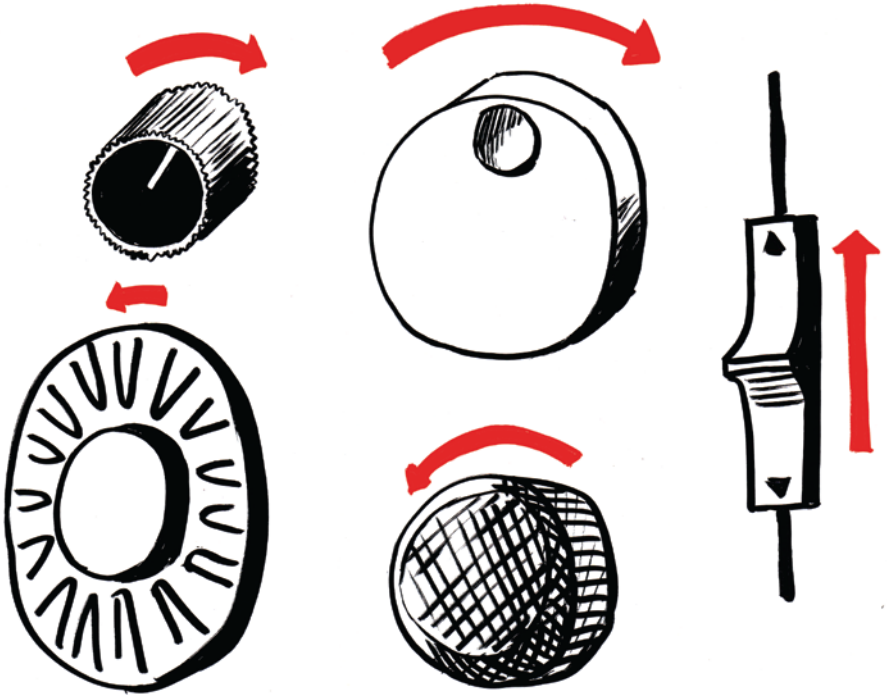
Our listener's ears prick up: she hits the Klippit button to note this moment for later. All the radio needs to do is send the station ID and the time to the online Klippit service, and the service figures out the best action to take. If she 'klipps' a song, it adds it to her Facebook profile, favourites it at Last.fm, and offers her purchase links. For a talk show, Klippit could save for later a couple of minutes of audio either side of the button press. And if the listener has added her email address to the Klippit account, a press could grab a fact sheet for a documentary, recipes for a cooking programme, or a follow-up for an ad to be sent to her phone.



Volume Voting

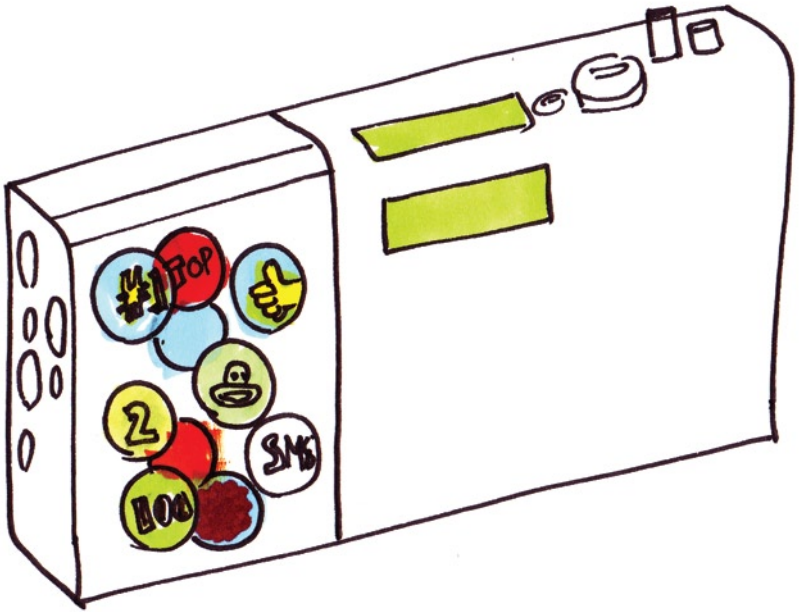
The DJ has a meter that looks a little like a speedometer in his studio. He extends an interview segment when he sees the meter level rise… but of what is it the level? The meter shows the average volume (anonymously aggregated) of every connected, tuned-in radio in the country. This ‘attention barometer’ is live feedback from the audience to the programme, a way in which each listener can vote with their ears. Primarily it’s a passive channel—listeners don’t have to deliberately choose to vote, so Volume Voting complements SMS and email nicely—but DJs could encourage collective action, perhaps making a Volume Chart, with which listeners would participate by telling their friends to *turn it up*.





Achievement badges

Our listener tunes in to jazz on three different stations, diligently catching shows every week. So the radio identifies her habits as rare amongst the audience, and rewards her with a ‘jazz fan’ badge, shown on the screen. Her relationship with the programming is improved, *and* she gets to show off to her friends. Bonus.

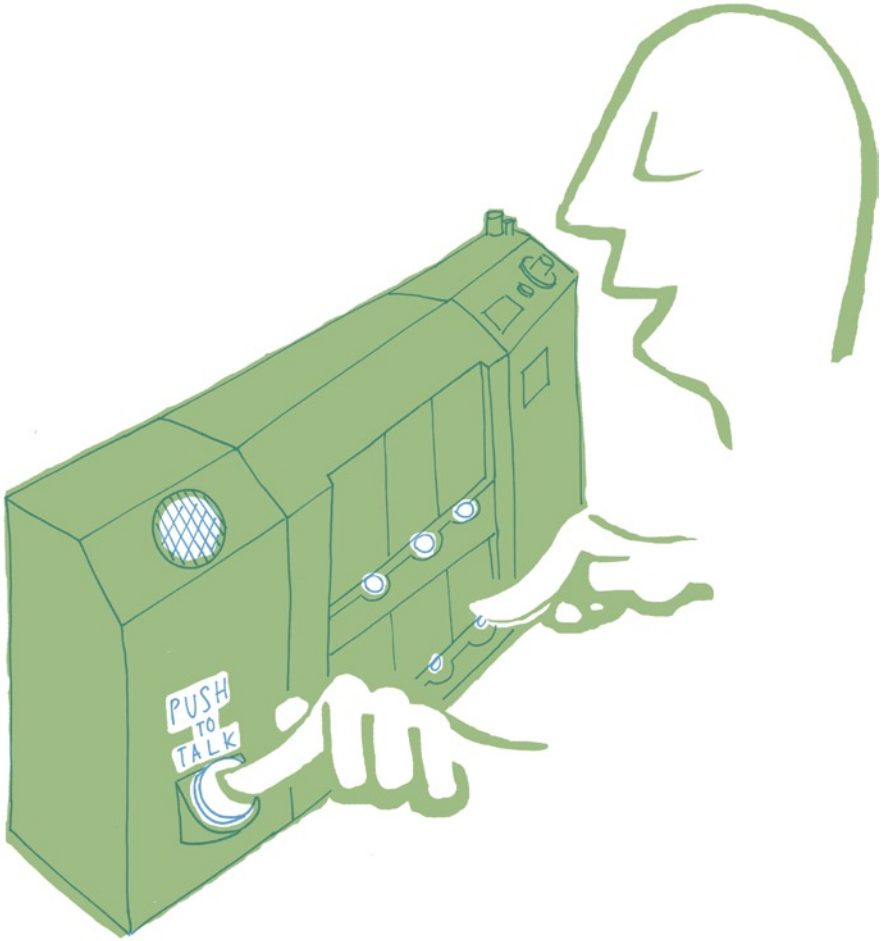


Whatson

The ‘miles per gallon’ reading in a hybrid car helps a driver improve her efficiency; measuring pace helps your running. Reflecting a person’s history and behaviour back at them means they can reinforce habits they like. Whatson, like the electricity monitor ‘Wattson’, tracks listening right on the radio, helping you achieve a healthy balance of news, classical, talk and pop.

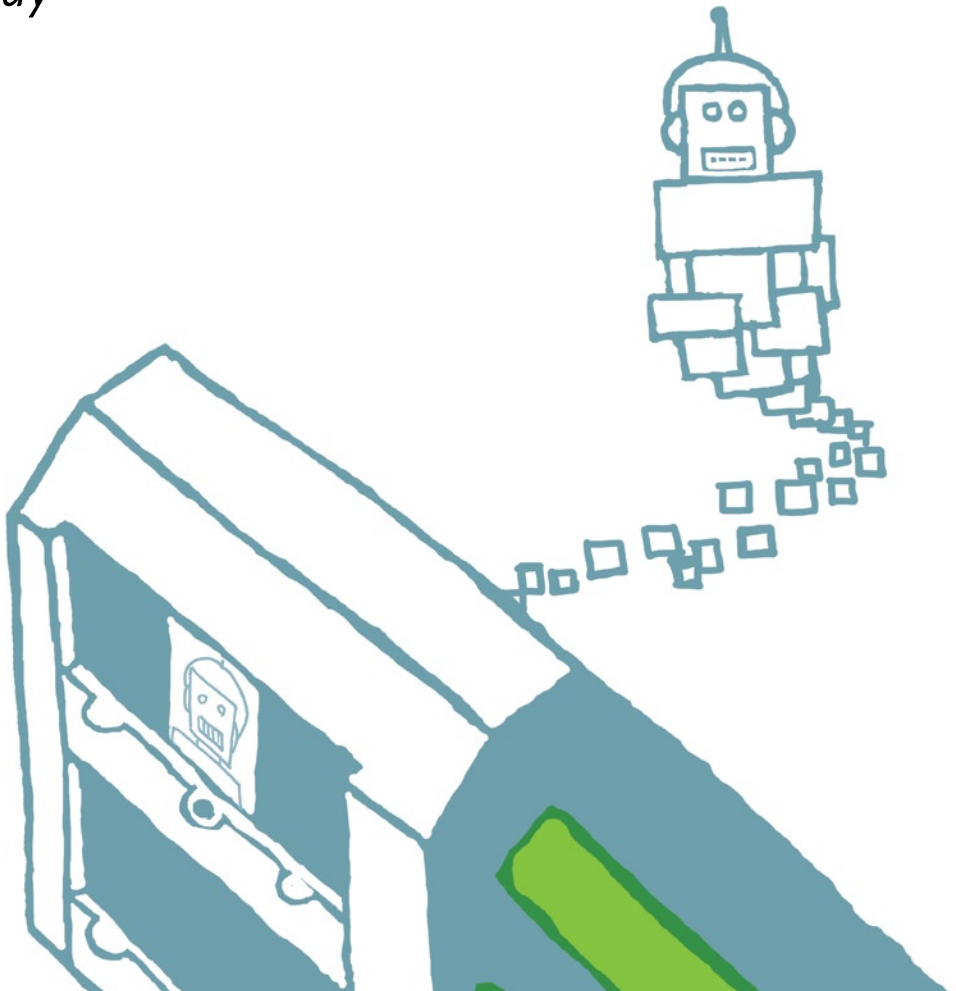
Push to talk

While we have many friends, there's but a small number for whom we'd put our necks on the line. Olinda invites sharing listening with these folks—who else would you let into your house whenever they wanted? Marrying this quiet intimacy with voice-over-internet leads to push to talk for the radio. Imagine holding down a button on Olinda, and having your voice carried into your friend's front room. You'd use it only carefully—but it'd bring you closer. For this, Olinda is a better platform than a mobile phone: when the listening light comes on, your friend is not caught up in meetings or stuck on the train, but hanging out at home and maybe ready for a chat.



Recommendations Buddy

Our listener has all six slots on Olinda full, telling her when and to what they're tuned in. But one slot is a robot! This robot friend appears to know everything that's on, whatever the station, and when a programme comes on that our listener would like—based on her history and Volume Voting—bing, the light comes on and that helpful robot makes his suggestion. By monitoring behaviour, online services can find more programmes like the ones our listener enjoys—good, new listening among abundant radio output. This can be presented as a 'virtual station' in the EPG, alongside the official ones, or as a robot: Recommendations Buddy makes introductions to new listening just like the radio itself, casual and personal.



Commentary: Central Data Store

The potential of the network for a radio doesn't stop with the ideas already identified: improving the listener experience, connecting the audience with the studio, and making listening part of our social lives. There are a thousand innovations, large and small, which can carry radio forward, but they rely on letting attention data be a platform for invention.

But what is attention data, and why is it so important?

Attention data is the constant stream of listener behaviour that comes out of the radio. In the form of volume level and 'now listening', it's the foundation on which many of these ideas are based.

But the ideas in this pamphlet—and other innovations we can imagine—also rely on hard number-crunching for recommendations, or comparing the attention data to the listener's neighbours in their social network. These are tasks best performed not on the radio device itself, but on some other machine on the internet.

So attention data must flow from the radio to some other service, where it can be aggregated and worked on. What are the characteristics of this other service?

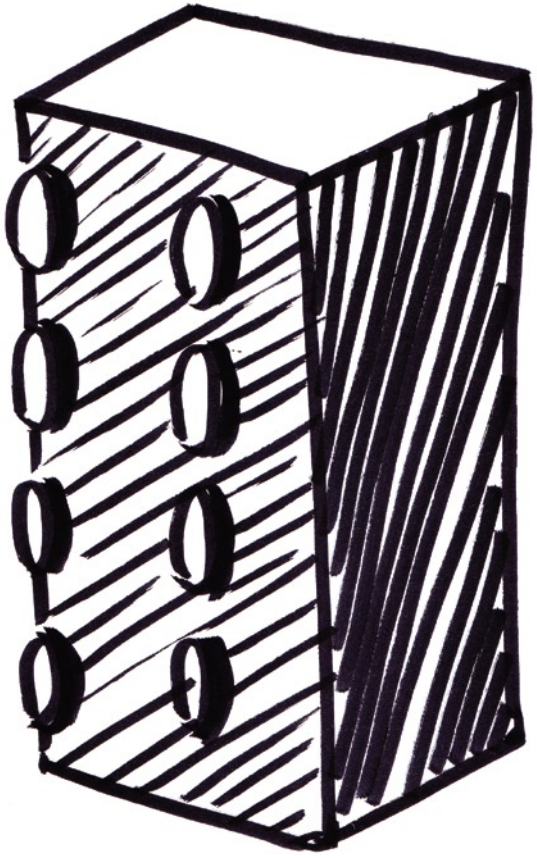
- It must be trusted, and have privacy controls—people own their attention data.
- It must allow other services to take streams of the attention data—we've learned from the internet that innovation comes from places we don't expect, so it's important to let parties large and small get involved.
- It must work hard to provide value, because the value of the network is being able to compare lots of attention streams in one place.
- But it must be humble and let people switch to an alternative in case they lose trust—and this means the attention stream must be based on open standards.

These characteristics imply that the attention data should be an independent broker, trusted by customers and separate from those who wish to build radios or products that make use of said data. It also implies that the attention stream should be expressed in an open standard.

It's when this is done that an as-yet-unknown small radio station can pick up the attention data and build a new type of show, reacting live to the audience through feedback streaming into visualisations in the studio, modifying the show on the fly, a new level of participation between the audience and programming… perhaps they'll revolutionise radio. But we'll only know if we give them the chance.

Modularity

This section discusses modularity as a key next step for consumer electronics and, through design concepts, looks at what that might mean for radio.



Modern websites—those popularly characterised as 'Web 2.0'—are not easily divided into distinct products. They have fuzzy edges. Flickr (flickr.com), the social photo-sharing service, is surrounded by a constellation of tools to upload photos to it from sophisticated mobile phones, use photos on TV set-top boxes, and print pictures to playful business cards. None of these applications were built by the Flickr company: they were developed by third parties to build a business around, scratch an itch, or just to do something cool.

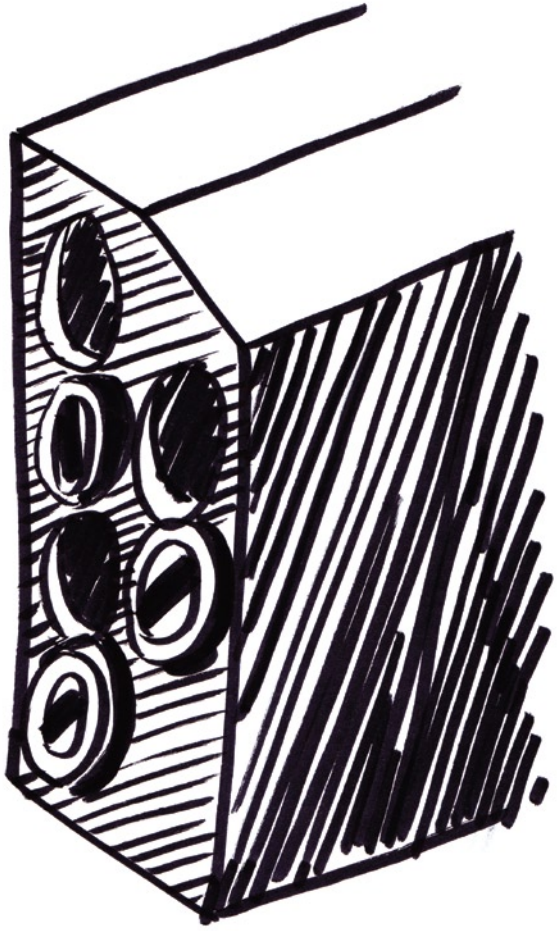
Web 2.0 is an ecosystem, now spreading out into physical devices, which allows users to customise their experience, building and sharing new uses and styles of interaction. While no given website is totally in control of its user experience, the experience as a whole is richer and more powerful as a result of this

fine-grained modularity.

More than that, websites which do decide to participate in the ecosystem find themselves in a system of mutual support: just as the consistent dock of the iPod (the specification and 3D models of iPods are published by Apple) leads to a large secondary market which in turn makes the iPod more desirable, the Web ecosystem makes all the websites which take part more desirable. Flickr, as a result of mutuality, is more valuable and harder to displace.

Just as the modularity on the Web is built on top of defined ways for websites to communicate with one another—each website has what is technically known as an 'Application Programming Interface' (API)—so Olinda has defined a way for extra modules to respond to, and control, the digital radio base unit.

This 'hardware API' is a concept used in small ways for toys (PixelChix is a modular virtual pet toy for girls) and in cameras, where the camera body must interface with replaceable lenses and flashes.



But Olinda takes it further, provided the hardware API as a way for individuals and third parties to extend the functionality of the radio itself.

Some uses may include:

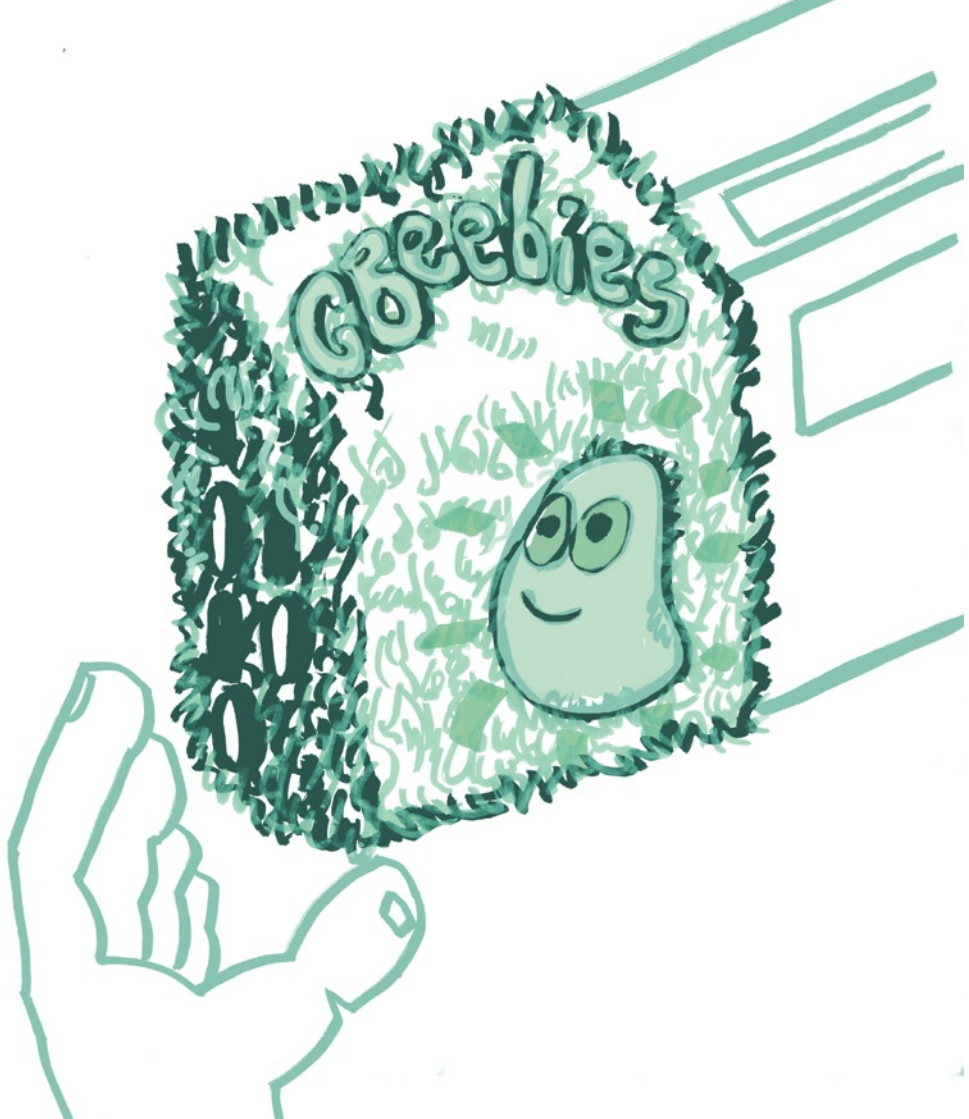
- Representing what's playing in a novel or more useful form.
- Providing an alternative control interface, or integrating with an existing system.
- Adding functionality, like a new decoding chip.
- Making the radio part of a larger system
- Low-cost, time-limited, more toy-like functionality.

By allowing third parties to springboard off the DAB functionality, a digital radio both allows low-cost modules to be produced that otherwise would not be cost-effective, and builds a secondary market around itself which makes it more valuable in general.

Next we discuss a few possibilities.

Children's tear-off

This kid doesn't know exactly when the programmes for him come on, or on which station, but he does know that when they do, the children's module will begin to glow, getting brighter and brighter until the programme starts. And he can grab the soft, friendly, glowing cube from the top of the module, and take it anywhere in the house, where it'll stream the audio from the base unit to where he's most comfortable listening. The on-demand version of the children's tear-off is like a bucket that fills up with programming over the week, recording appropriate programmes to be played back whenever there's a good time.

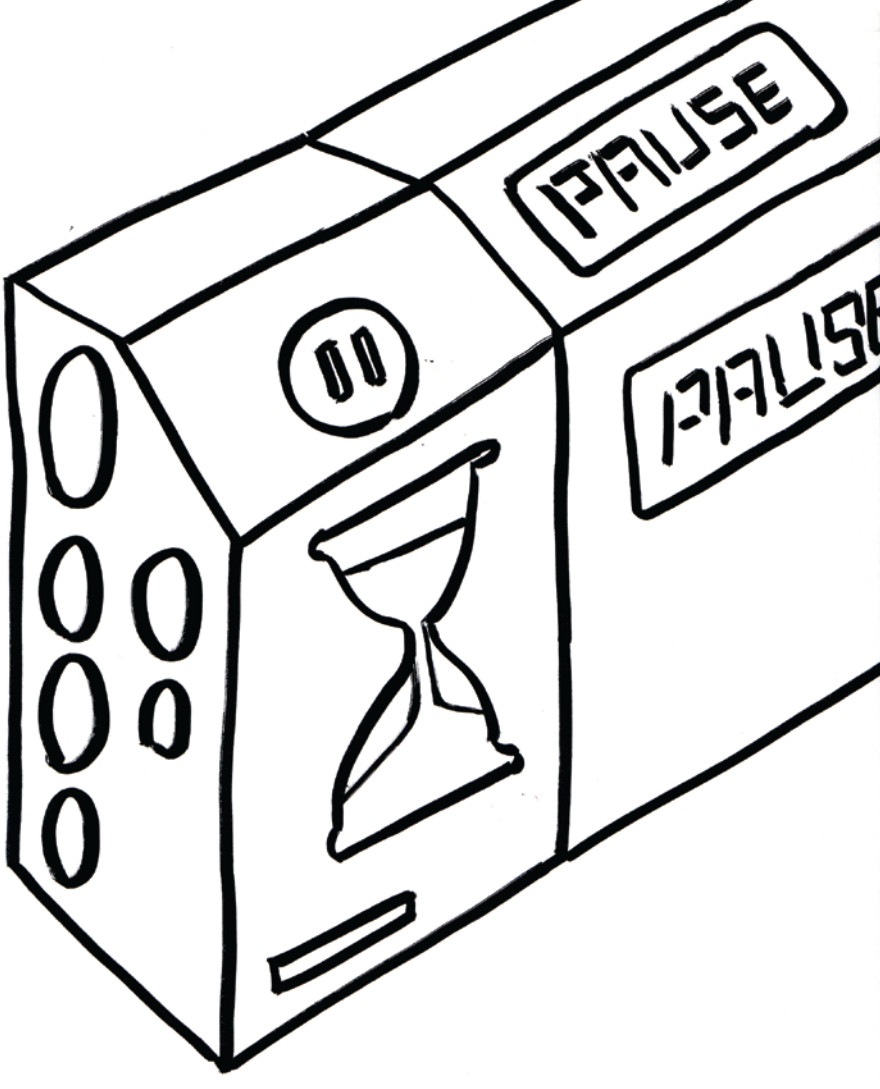


Pause module

If a radio comes as just the basic speaker and tuner, then semi-standard functionality that not *everybody* needs can come as optional modules. A pause function is one such module: it records a rolling hour of audio, and uses this to let our listener pause live radio by pushing a big button on the top.

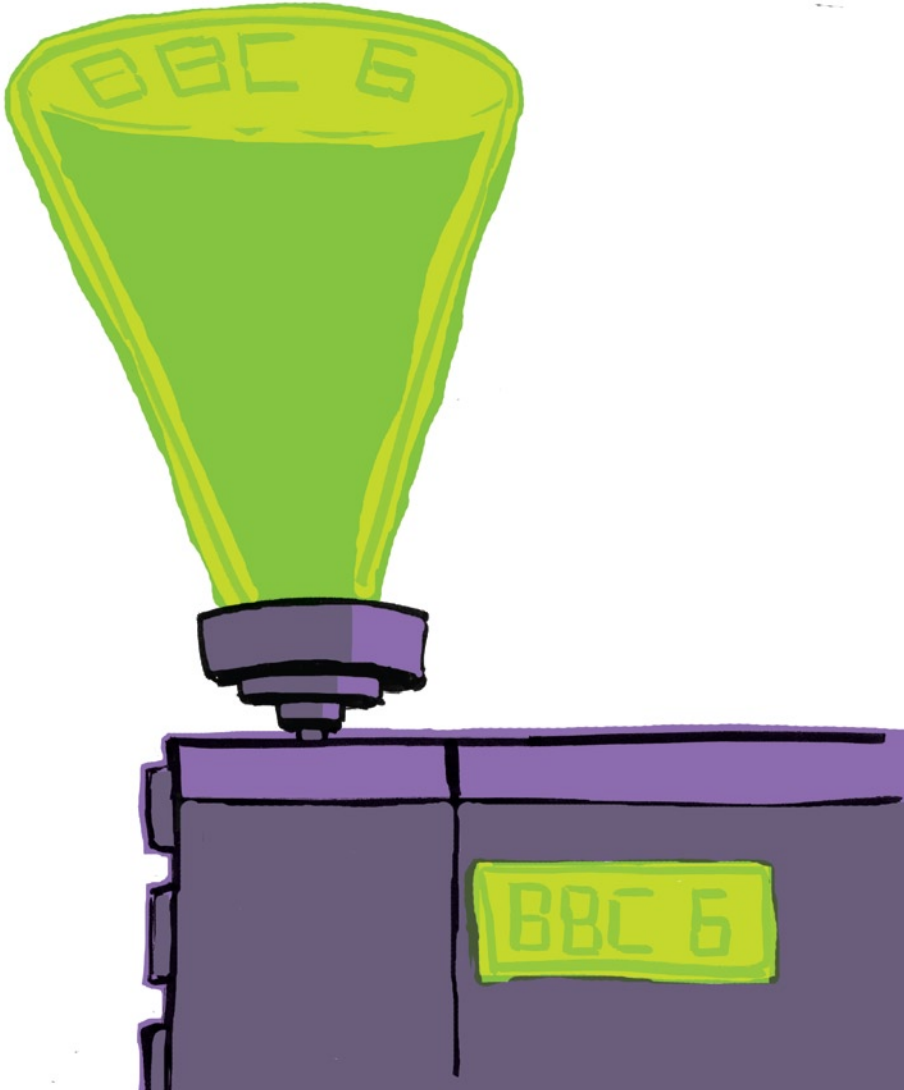
MP3 mix tape

Our listener hits a special button whenever a track she loves is played. Her extra module converts the whole song to MP3 (it caches a few minutes of audio), and squirts it onto the USB memory key that's plugged in… and many memory keys double as simple music players. Ta da, a modern mix tape to gift to a friend.



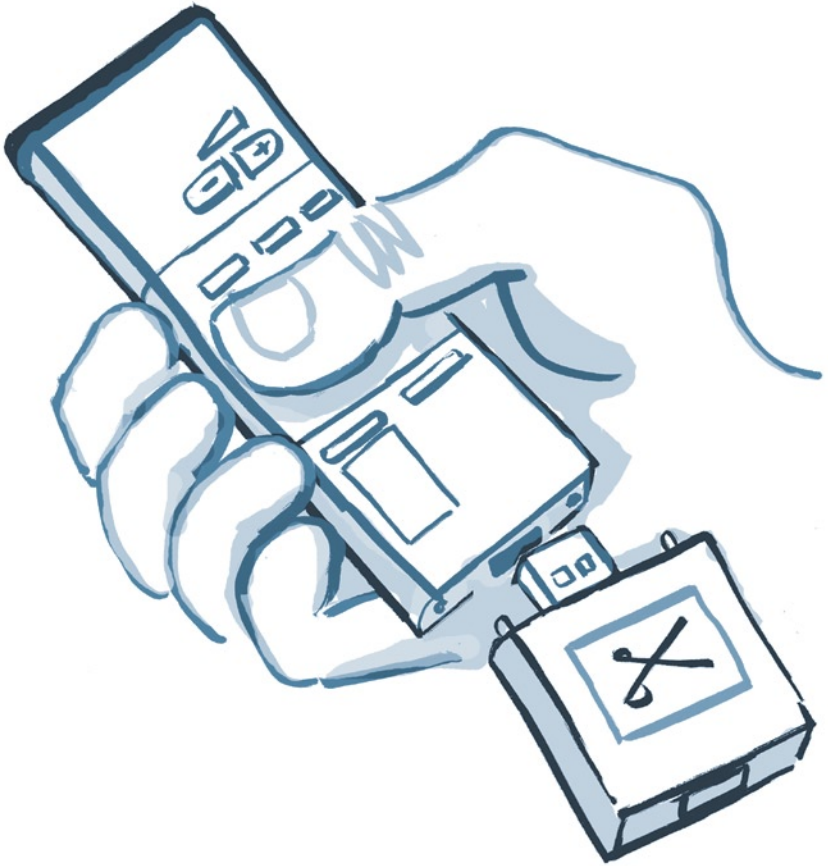
Now-playing projector

Some modules are extremely simple: one turns the radio into an alarm clock with snooze. Another transmits the audio to speakers around the house. This one merely takes the station name and DAB text, and projects it onto the ceiling or wall so it can be seen across the room. Handy for some!



IR remote

Snapping the infra red receiver module on means the radio can now respond to a remote control, which some listeners prefer. The remote could itself be modular, allowing miniature remotes to be snapped onto the bottom, expanding the number of buttons to accommodate the extra modules on the radio base unit.

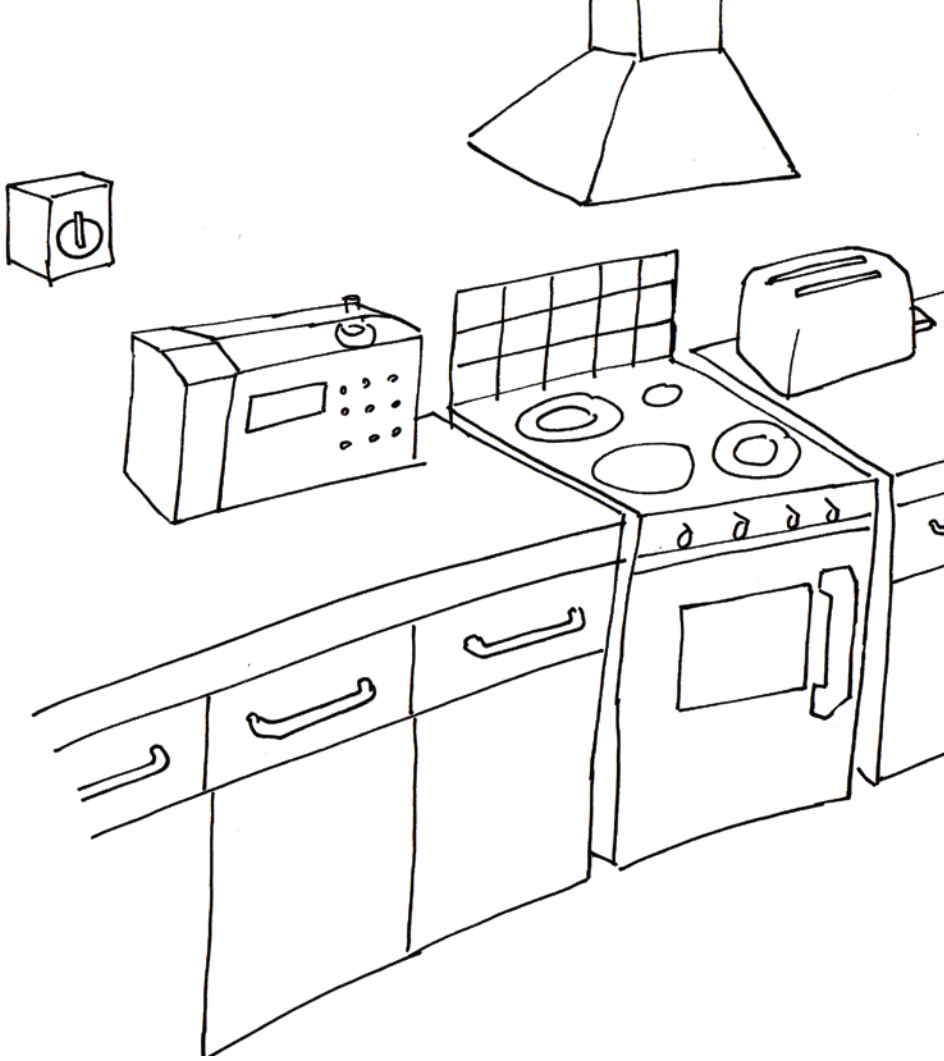


Mobile phone charger

The kitchen is the landing pad to our listener's home. It's where she drops her mail when she steps in; it's where she leaves her house keys, bag and mobile. And it's also where our listener has her radio. The mobile phone module—is just a tray which takes the radio power and exposes it at a mobile phone plug. This module has the potential to be the centre of our listeners landing pad. It can have a surface like a white board for reminders and a slot for a stack of Post It notes. An integrated iPod charger cements this central role, and opens the module to further functionality: recording audio to the iPod for portability, and using the playlist on it for radio station recommendations.

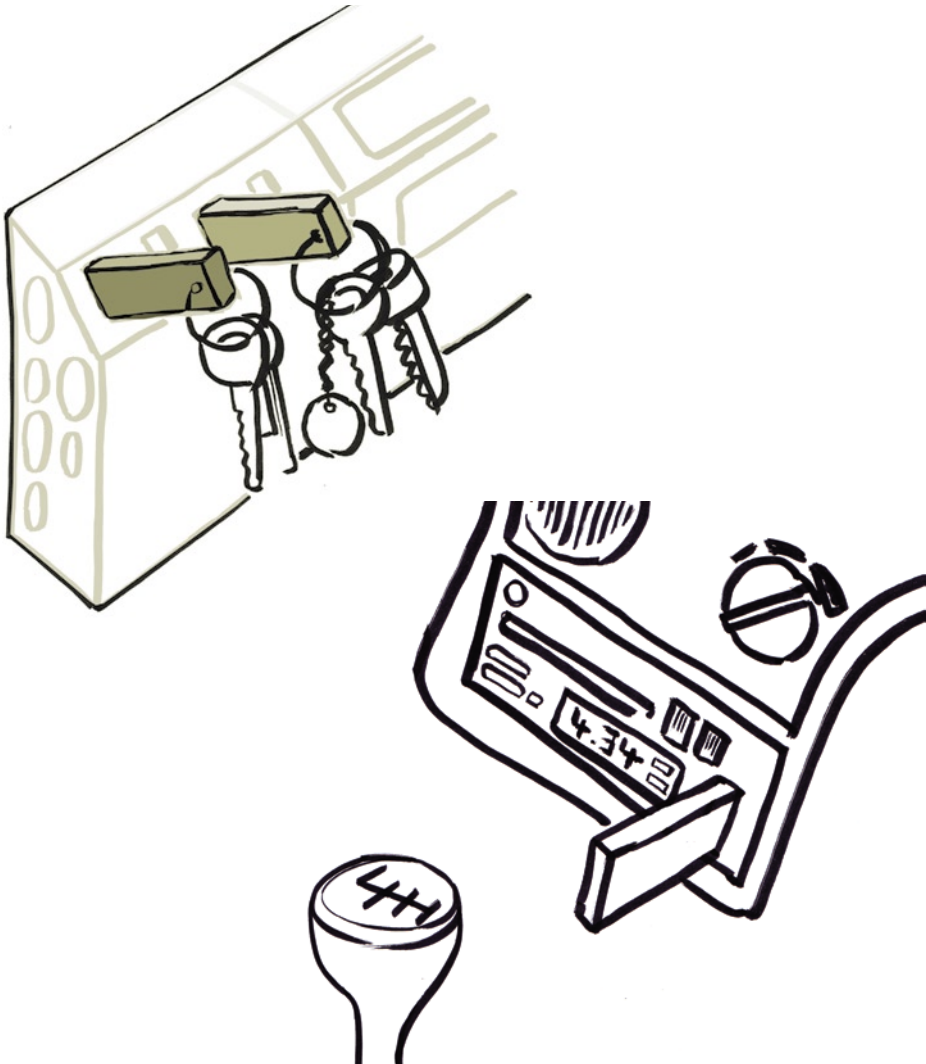
House alert base station

The radio is ideally suited to host the ‘home alerts hub’. Whenever a device needs our listener’s attention while she’s not standing in the same room, the device sends a signal to the hub, which itself sounds a configurable alert. What kind of alerts? A smoke alarm needing a new battery. The microwave finishing a long defrost. The family computer finishing a movie rental download. The doorbell. Each of these will produce a sound from the home alert module via the radio—which also lists recent alerts on a screen, and forwards some alerts by SMS if necessary. In the case of the doorbell, an integrated microphone links up with the door speaker. This module is our home’s way of saying ‘hey, can I interrupt?’



Profile key fob

Our listener comes home and puts her keys down, plugging her USB key fob into the radio's profile module. The radio tunes to her preferred station… but then 10 minutes later, retunes because there's a programme she never misses. Later, our listener leaves the house. Plugging the USB key fob into her car radio, the profile is read and the stereo starts playing the same station that was on when she left the house. She's barely missed a minute. The key fob—via the profile module—is how the radio knows which listener in the home is using it, and the profile can be edited from the website for more advanced functionality. Alarms and preferences become portable between homes, cars and hotels.



Commentary: hardware APIs

The Apple iPod has a large selection of peripherals created by third parties. The dock connector provides '*a standard electrical interface and communication protocol for accessories to charge, control and interact with both iPhone and iPod*' (description from Apple's developer website). What this description *doesn't* mention is that the dock connector hasn't changed since its launch in 2003.

Technical stability has not only meant that peripherals are not fragmented between different iPod models, but also sends a message to third parties that it's worth investing in the iPod as a platform. The novel cases, remotes, sound recorders and wireless pedometers all help drive iPod sales. Apple charges a royalty, but the iPod's market share is already so high that the fee doesn't inhibit development.

As a counter-example, Canon combination photocopiers host Java platforms for customers to write customised user interfaces. Again there is a per-deployment royalty payable. The fee, however, dampens development. The platform has not taken off as a significant secondary market.

Open APIs are also offered on systems like blogs, and websites like Flickr.com and Amazon Web Services—which has led to a profitable market in blog hosting and authoring applications, printing and upload applications for Flickr, and many small bookshops built on the Amazon platform. These interfaces are royalty-free.

There are lessons here.

Commentary: standards

Open standards necessarily mean choice, which is a disadvantage if manufacturers wish to 'lock in' customers. But proprietary standards only aid lock-in once a product already has high market share.

In the case of the radio industry, nobody is going to get rich from defining an interface (because market share is not high enough for a single product)— only from implementing an existing one. The industry is more like the early Web: there will be a few companies building systems that implement the standard (that is, radio manufacturers), and many companies building on the platform (here, peripheral manufacturers). And both will benefit from the success of the other. It is in the manufacturer's interest to invest in a standard to bring to life a market for peripherals.

Given there isn't profit in the initial definition of a hardware API, the party who defines it should be non-commercial, with the ability to evangelise, and a knowledge of the whole DAB industry.

Stability, simplicity and openness in any interface are required qualities to win support from developers and gain adoption.

- Stability: The iPod dock connector remains unchanged after five years and many tens of millions in sales. The Amazon Web Services interface changes only rarely.
- Simplicity: In the world of interfaces to websites, simple structured text has won out over the less legible, but official Web Services (WS) stack. Simplicity lowers the barrier to entry, triggering the increasing returns of network effects. The hobbyists trying out an interface are the ones who will later bring it into their businesses.
- Openness: In the current discussions about document standards for office applications, Microsoft is experiencing difficulties in part because its proposal is rooted in its own proprietary document standards, previously used to bolster their market position. There is a lack of trust in the stability of the interface.

Other considerations are physical and financial. The first devices to adopt this interface will face customers who are unaware of its function: the hardware API should physically be small.

And to encourage adoption by peripherals—which is good for all manufacturers—the standard should, like web APIs, be easy for hobbyists to implement, and royalty-free.

Background

Generation C

The key audience for this prototype is the group, first identified by trendwatching.com, Generation C. Gen C is not defined by age, but by their activities. Trendwatching discusses it like this:

'So what is it all about? The GENERATION C phenomenon captures the an avalanche of consumer generated "content" that is building on the Web, adding terapeta bytes of new text, images, audio and video on an ongoing basis. The two main drivers fuelling this trend? (1) The creative urges each consumer undeniably possesses. We're all artists, but until now we neither had the guts nor the means to go all out. (2) The manufacturers of content-creating tools, who relentlessly push us to unleash that creativity, using – of course – their ever cheaper, ever more powerful gadgets and gizmos. Instead of asking consumers to watch, to listen, to play, to passively consume, the race is on to get them to create, to produce, and to participate. Examples? It's Canon telling aspiring directors and photographers that "professional digital photography is no longer just for the professionals", while Sony speaks directly to Home Movie Directors and DVD Producers.' (Source: trendwatching.com/trends/GENERATION_C.htm)

What we have identified is that this trend, while it started in new media, has extended to craft and products more generally: witness the popularity of O'Reilly's *Make* and *Craft* magazines, the magazine *Readymade*, and online shops and educational services such as etsy.com and instructables.com.

What Generation C expects from its products can be summed up in three parts:

1. Products should be adaptable. Just as websites are participative and conversational, and blogs can be reskinned, mobile phones must also be customised (because the choice of customisation communicates socially), and other products must be open to co-creation too.
2. Products exist in an electronically networked environment. Wireless internet is becoming pervasive, and if that is not available then a computer with broadband is. Products should take advantage of this live communication.
3. Products exist in a socially networked environment. Every product we carry is (a) a badge which carries a message about how we see ourself; and, (b) a 'social object' which enables conversations (in media, a programme performs just this function).

This DAB prototype demonstrates how even a minimal social network promotes discovery of new programming, which allows those programmes to act as social objects—or, to put it another way, conversation starters. It also shows the benefits of adaptable products, and the advantages a permanent internet connection brings.

Mixed programming

The Introduction mentioned a listener's discovery and exploration of a wide variety of programming as a design aspiration of Olinda. Historically this has been achieved by mixed programming: the BBC's earliest established networks, in the 1930s under Reith, were mixed programme networks. The listener was to be 'surprised into' an interest in a new subject. This approach was not entirely popular.

Launching in 1933, Radio Luxembourg's Sunday programme of light music was more popular, in terms of listener numbers, than the 'Reith Sunday' mix of talks and classical music. The pattern was to be repeated over the coming decades. The BBC would attempt some form of mixed programming, and a more populist station would move the BBC towards a more uniform output on each network. Significant moments include television, the launch of VHF and mobile radio (portable sets and car radios), pirate radio, and the 1990 Broadcasting Act (which released the new Radio Authority from its public service obligations).

While this history could be read as an affront to the ideal of mixed programming and the Reithian ideal, Andrew Crissell (in Understanding Radio) puts Reith into a historical and technological context:

'The original Reithian case for providing a radio service that offered something to everyone and maintained a political balance was the shortage of wavelengths: sound broadcasting was a scarce natural resource, and so the few stations which existed should each cater to the full range of listener needs and tastes. But this case had been weakened by the arrival of FM, which created much more room on the spectrum—room for a multitude of stations, each of which could offer its own specialised output, and (like newspapers) its own political "line."'

The recent explosion in radio—broadcast and streamed online—can be seen as the resurgence of the possibility of the mixed programming ideal, if only listeners are able to encounter new programming and experience serendipity.

Television, of course, has made this transition. Video downloads, BitTorrent and—less sophisticated but just as important—cheap DVD boxsets have allowed people to recommend and socialise around television shows. Even the simple Electronic Programme Guide is a big step in this direction, and channel surfing itself is a step towards mixed programming. In the television world, broadcasters, the infrastructure and the devices are all changing to respond to viewers and keep up.

Radio is not moving as quickly. Podcasting (as downloads and radio produced by individuals), internet streaming radio and personalised radio have all come from outside the radio broadcast industry, and the industry has yet to significantly open itself up to these developments. With radio sets which do not recommend new listening, and are hard

to retune, listeners (and 'hearers') are unlikely to mix their programming.

Building a minimal social network into the device opens up discovery once more, and goes some way to solving an even older problem: a radio 'audience' is not an audience in the sense of a theatre or music audience, because they cannot influence one another or the performers. They do not act as a group. By introducing small social groups who may guide one another's listening, we point at the re-introduction of small audiences (in the traditional sense) as the logical next step.

The Web

In design terms, products on the Web have been innovative in two areas: social software and adaptive design.

Social software is the acknowledgement that people live in groups and communities, and occupy homes and workplaces. Social software designers study psychology, presentation of self, and group dynamics in order to make products that better fit people and their social lives.

The use of social networks to filter information is probably the most common manifestation of social software online: although friends don't always have similar interests, a recommendation from a friend is generally better than one from a stranger, a fact which is down to the recommendation being improved by knowledge about the relationship with the other *outside* the act itself. This is why friend lists on Last.fm are helpful.

And of course, the existence of social networks online *at all* is down to the realisation that people want to browse the Web not alone, but together with their friends, and to make new friends. When socialising moves online we see familiar patterns arising, like people using badges to tacitly communicate their personality (just as a goth will use clothes to communicate membership of a subculture, and therefore something about themselves), doing favours to build reputation, and general game-playing, just as in (physical) life. Much of the activity on Facebook is of this kind: using social play to maintain and strengthen existing relationships.

On the more utilitarian side, to work and create together people use wikis, blogs and instant messaging. And it's when we look closer at social software that the more subtle design factors come into play: background awareness of friends and colleagues is required, so that people can synchronise their work. People maintain a small group of close friends, and these need to be dealt with differently in software (see, for example, the 'Top 8' in MySpace).

Beyond socialising, there is a culture of creativity online, from composing entertaining blog posts to 'Photoshopping' pictures to post on messageboards. In fact, there is a gradient towards highly complex and time-consuming participation, like maintaining a message board for a community, or contributing to open source projects such as Linux.

In-between there is the tinker mode,

which is when a person takes what's on the Web and adjusts it to their own needs: downloading a custom photo uploader to use with their new camera and Flickr; installing a Facebook app or blog plug-in to show a list of recently read books; spending time designing and painting clothes for a new avatar in Second Life.

Creating websites and software that can be so modified and added, and designing ways to *show* that these can be modified: these are subjects of *adaptive design*.

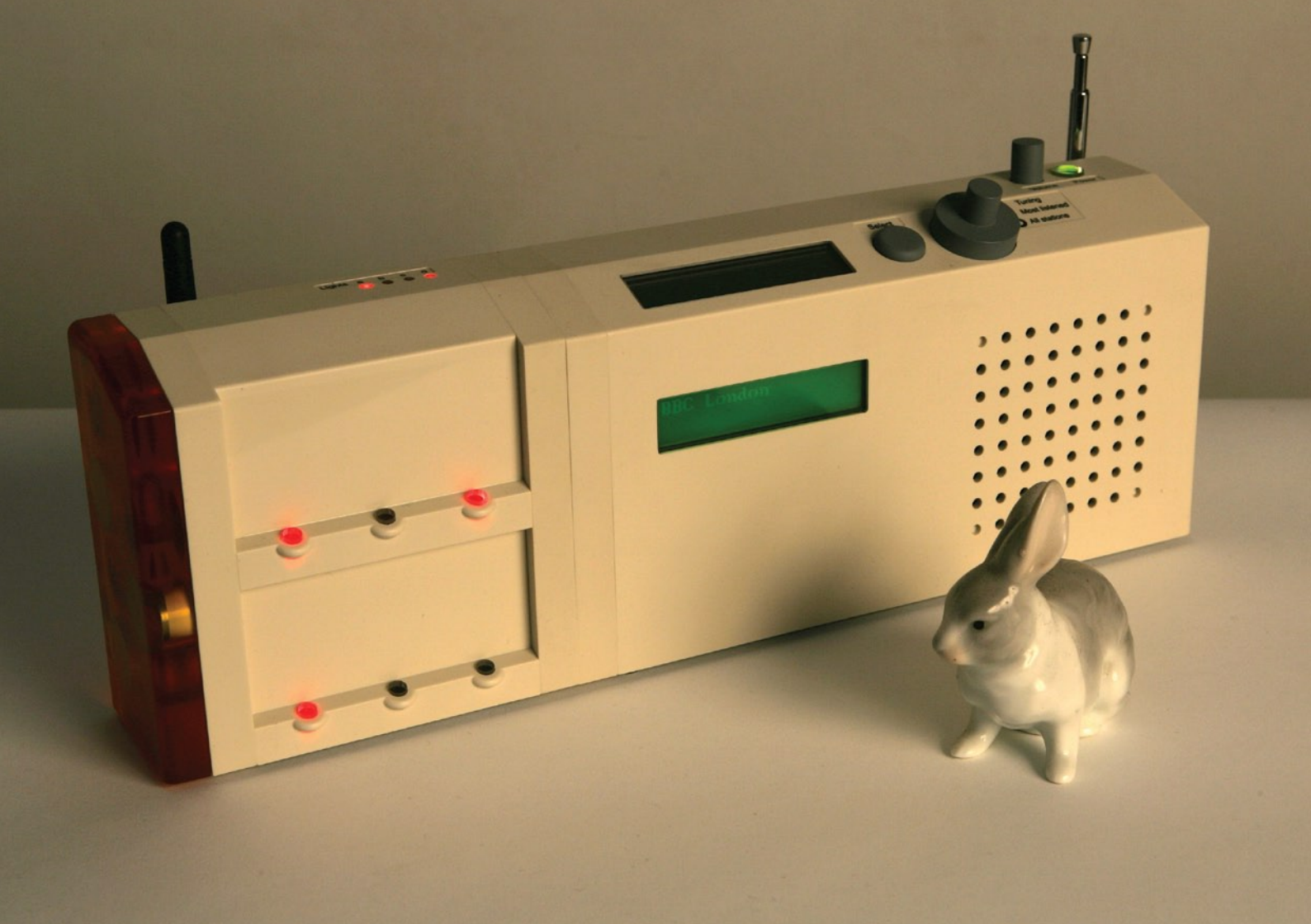
Adaptive design regards technical features like Web APIs (interfaces for one application to make use of the features of another, without human mediation) and a website for a person to curate their own custom TV channel as similar approaches—a way for the end user to get involved in what used to be the preserve of a faceless designer, a process called *co-creation*. Other manifestations are the rise of customisation in offline goods like trainers and cereal, and the small and large repurposing of products, like covering a games console in stickers, or extensively modifying a car.

Sociality and adaptability have been taken on as *expectations* by the upcoming generation of consumers—called, elsewhere in this book, Generation C. Since it is the Web that has fulfilled these expectations of Generation C so well (and been built largely by them, too), it is to the Web that we look for inspiration.

The sharing module of Olinda can be written on like a whiteboard because it reflects stickering culture. It is modular because of the popularity of adaptive websites, and uses the term 'hardware API' because the term 'Web API' is used by many websites, including Flickr, the photo-sharing website adapted by tools and toys built on its API by fans and third-party businesses. The hardware API itself is visible because the possibility of adaptability must communicate itself loudly, even if unused.

Observation of social software online has driven Olinda to use background awareness instead of audible alerts to indicate when friends are listening to their radios, and to concentrate on the small group of six instead of the 150 person friends list.

After several years of the Web imitating physical world patterns like shops, magazines and office desks, it's maybe time for physical products to look at the successes of the Web, and take those as inspiration.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Licencing

Olinda is a design prototype. Conventionally, the implementations of and protocols behind concepts like the hardware API, social sharing of listening and other novelties developed for this radio might attract intellectual property protection.

To encourage development of these ideas, the BBC has agreed to waive certain rights, following a pattern which has proved successful on the Web, there called the 'Creative Commons Attribution License' (creativecommons.org/licenses/by/2.5/). This licence allows for sharing and remixing of a work, provided the original author is credited in the derivative work. It means remixing is supported without requiring any lengthy negotiations or discussion.

In the case of Olinda, the legal situation is this: the BBC grants any third party a fully paid-up, perpetual, worldwide, non-exclusive licence to use, modify and sub-licence concepts,design elements and novel technical solutions in Olinda and this book, provided such third party conspicuously and appropriately publishes on each copy an appropriate notice acknowledging the BBC and the copyright that it owns. In non legal terms, it means this: if you can see it, you're more than welcome to it (and please say thanks).

For further details please contact John Ousby (john.ousby@bbc.co.uk) at BBC Audio & Music.

Credits

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