Technology focus

The Which? scientists explain what happens inside your gadgets

Demystifying digital cameras

CAMERAS EXPLAINED

Although film cameras and digital cameras look quite similar on the outside, inside they are worlds apart. With a film camera, light goes through a lens and hits a film inside the camera. The film has sensitive chemicals that react to light, helping to create a picture.

Digital cameras have lenses, too, but once light passes through the lens, the process is electronic. We explain the way most digital cameras work.

Inside the camera body there's an electronic sensor. It is small – in some cameras it is tiny – but it plays a key role in creating your image. When you press the button to take a photo, the sensor's pixels measure the brightness of the light coming through the lens. The pixels are like tiny dots, measuring less than 0.01mm x 0.01mm each, and cameras have millions of them; a 7 megapixel camera will have seven million. These pixels collect colour information as well – a colour filter on top of the sensor helps with this.

Digital information is created and pushed on to a temporary memory very briefly. It is then digitally processed, before being pushed on again and written on to the camera's memory card. You can then transfer it to a computer, printer or photo kiosk, or even delete it if it's not up to scratch.

The sensor is at the heart of your digital camera. It pulls together data to create your images

Back to the future Paying

THEN

The number of cheques written each day more than halved between 1990 and 2006.

NOW

Successful trial of Oyster card and Barclaycard combined on one piece of plastic. Passengers pay for coffee and sandwiches with their tube pass.

AND BEYOND

The next generation of mobile phone handsets is expected to add a credit card function. New technology called near field communications will turn your phone into a wallet.

We learn about the possible future of broadcasting

The intrigue of tomorrow's TV

FUTURE

Huw Williams is Head of Research & Innovation at the BBC. It's his job to see how new technology can enhance our viewing experience, so we asked Huw to pick out some exciting areas of change in the next decade and beyond.

For starters, Huw is confident that TV will become more interactive. For instance, the BBC is aiming to make the 2012 Olympics the 'digital Olympics'. 'Gone are the days when you just stuck four cameras round the ground,' Huw says. 'People expect a more crafted and interesting set of visual images.' Instead of just watching the 100m race, viewers in 2012 might be able to access performance data on each runner. This could let you create your own virtual race or even set the stars of 2012 against the champions of yesterday.

The BBC launches Freesat – a free-to-view satellite TV service – next year, which will include high-definition channels. However, Huw is already looking beyond high-definition footage and even 3D television could be on the horizon.

'There's a lot more work to be done and whether we will have the full holodeck [a virtual reality room] is another matter,' Huw says, adding: 'It's an intriguing world ahead and difficult to predict.'

So don't blame us or Huw if interactive, super HD 3D *EastEnders* never makes it to the airwaves.

The BBC's Huw Williams

PHOTOGRAPHY ALAMY, SUPERSTOCK ILLUSTRATION PAUL WOOTTON

116%
increase in tech products we test – up to more than 800 this year
SOURCE: WHICH?

£1.85 billion
spent on electrical products in supermarkets, up 60% on 2006
SOURCE: THE GROCER

You'll need a new TV to fully enjoy high-definition DVDs

The devil's in the detail

DVD

There are two rival high-definition DVD formats: Blu-ray and HD-DVD. The two formats are incompatible but do have one thing in common – neither works properly with most HDTVs on the market.

Shockingly, despite labels like HD Full and 1080HD, if you've bought a new flat-panel HDTV in the past couple of years it will not display HD-DVD or Blu-ray movies properly. And as if that isn't bad enough, the first high-definition DVD players on the market are already obsolete.

In a nutshell, the problem is a mismatch between the number of pictures per second recorded on to the discs and the number which players and TVs output and display on a screen.

None of the first wave of players and hardly any TVs on the market matches the picture rate of the discs (see diagram, below, for more information). The result is juddery movements during fast-motion or camera-panning scenes.

We first revealed the problem back in February (see *Which?*, February 2007, p11) and hoped that it would be a temporary glitch. If high-definition discs were manufactured at slightly faster, traditional European speeds, they would work with the players and TVs already available – the difference in speed is so minimal that most people are blissfully unaware of the effect on normal DVDs.

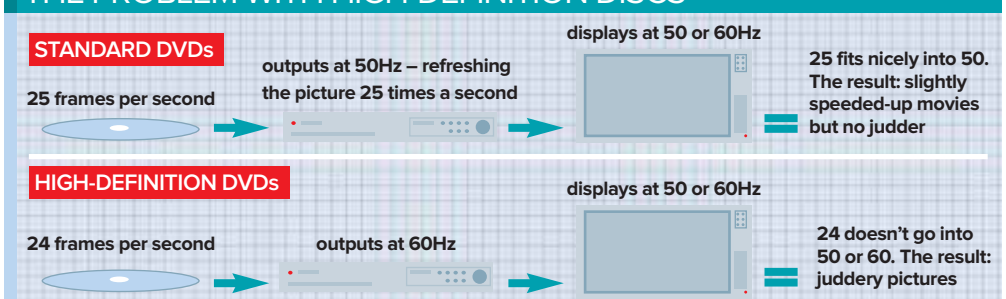
Don't believe the hype. Current equipment isn't ready for HD

Now is not a good time to buy a new DVD player or TV

But alas, no. Instead, Pioneer, Sony and Toshiba are the first to release new high-definition TVs and DVD players designed to match the speed of Blu-ray and HD-DVD discs. Sony calls them 24p True Cinema models and says viewers will benefit from being able to watch films at the speed at which they were originally recorded.

VERDICT The move to high-definition DVD means there's a mismatch between new discs and most existing HD equipment. New HD TVs and DVD players should fare better – we'll have results soon. If you're interested in high-definition DVD, now is not a good time to buy a new player or TV.

THE PROBLEM WITH HIGH-DEFINITION DISCS



News in brief

Tech focus update

As reported in our May issue, p34, several European countries may adopt a new digital radio broadcast standard known as DAB+. Current UK digital radios cannot receive DAB+, but this is about to change as Pure plans to launch the first model that can be upgraded.

If DAB+ is ever adopted in the UK, it won't be for many years – as confirmed by our talks with industry insiders. We'll keep you updated and test upgradable radios as soon as they're available.

USB bling

Philips and Swedish jeweller Swarovski have teamed up to produce the world's first USB memory stick jewellery. For a cool £120 you can be the envy of all your friends and have space to store 1,000 photos or 250 songs.

Mobiles + Mopay = Cash

Pocket an average of £25 for your old mobile phone with www.mopay.co.uk, a recycling website. Use the site to match your phone to one of the 2,000 different handsets from 27 different manufacturers and Mopay will buy and recondition it. The site then sells your phone back to the UK market or developing countries, donating 10 per cent of the final value to charity.