

# FAREWELL TO THE KODAK DCS

John Henshall looks at Kodak's legacy as the end of its DSLR production is announced.

**W**hen Kodak introduced the the world's first totally portable Digital Camera System – the DCS – in 1991 it established Eastman Kodak as the world leader of professional digital image capture.

Fourteen years later, Kodak has just announced that it is ending production of Digital Single Lens Reflex cameras.

The DCS was a product launched ahead of its potential market, but one which indelibly marked the start of the future of photography.

Kodak was smart. It housed its DCS in something photographers were already at home with: a Nikon F3 camera body. All the F3's functions were retained, and the DCS used standard Nikon lenses. Only the focusing screen was changed.

A new Kodak-produced digital camera back was fixed to the Nikon F3 body. A light sensitive integrated circuit – Charge Coupled Device – was fitted into its film plane.

This CCD image sensor had an incredible 1.3 million individual pixels – more than four times as many as in television cameras – arranged in a 1024 x 1280 pixel rectangle measuring 20.5 x 16.4mm. This was much smaller than the 36 x 24mm standard for 35mm film.

Today, I have a camera with exactly the same resolution, which I carry everywhere. It was supplied to me free and it's in my pocket right now. It has a very useful additional facility which the DCS did not have: I can use it to speak to people. It's my cellphone.

Kodak's technology was awesome and the DCS camera cost £15,000.



1991: The original Kodak DCS [100] and DSU



1992: DCS200



2005: Last of the line – the DCS ProSLR/c

The relative sensitivity of the DCS camera back was ISO100. Exposure could be 'pushed' by one, two or three *f*-stops to ISO200, 400 or 800 on an individual shot-by-shot basis.

It was not necessary to expose a whole 'roll of film' at the same ISO rating, as was necessary when shooting film.

The DCS was not a self-contained digital camera. It had to be connected to a Digital Storage Unit – DSU – by an umbilical cable.

The DSU was a battery operated 200 megabyte recorder which could store about 150 uncompressed or 600 compressed images.

It weighed 11lb (5.1kg) and could be worn as a backpack.



Kodak DCS [100]





From six to twenty four images could be captured at a burst, depending on how much RAM the DSU had on board, at a shooting rate of 2.5 shots per second.

The DSU allowed full control of the recorded images, from viewing the exposure on the built-in monochrome Liquid Crystal Display screen – LCD – to deleting unwanted images to make room for further exposures.

My first pictures shot on the DCS were made at Kodak's Center for Creative Imaging, in Camden, Maine, in July 1991 on the prototype – serial number 001.

The shot of the Kamatz watch was one of these images. The TIFF file size of DCS images was 3.73MB.

Filtration on the DCS's CCD was one column of alternate red/blue pixels followed by three full columns of green. The three green gave the camera its sensitivity and resolution but the low sampling of red and blue – only 12.5%

of each – resulted in pronounced colour aliasing on some subjects. This can be seen quite clearly in an enlarged section of the watch.

The dynamic range was limited – note how both highlights and shadows are lacking in detail in the shot at the top of this page.

Yet, despite these limitations, the Kodak DCS was a landmark product: the first DSLR. The DCS was a system

which would facilitate instant filmless photo-journalism.

Only a year later, in August 1992, Kodak launched a second digital camera – the DCS 200. The original DCS then became known retrospectively as the DCS100.

The DCS200 made a huge leap forward: it was completely self-contained. No umbilical. No separate storage unit.

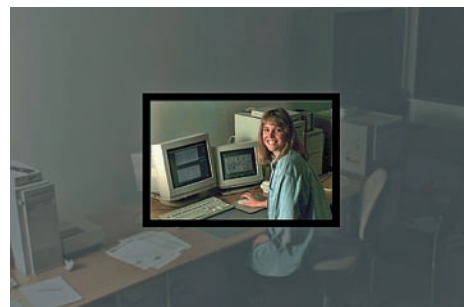


Inside the body was a tiny hard drive which could store fifty images before the camera developed 'digital constipation' and had to be relieved of its images before continuing to shoot.

Again the camera was based on a Nikon body – this time the autofocus N8008s, or 801s as it was known in the UK. The new 1.54 megapixel CCD had

the same 1.5-to-1 format as a standard 35mm film frame.

The new chip had more pixels – 1524 x 1012 – but, at 14 x 9.3mm, was physically smaller than the CCD in the DCS100. This meant a 2.6x focal length multiplier, compared with the 1.8x of the DCS100. Viewfinder optics were unchanged, so the viewfinder image was masked to a tiny frame.



I used the DCS200 to report for *The Photographer* from conferences in the USA, spending sleepless nights sending images back to the then editor David Kilpatrick by slow modem using one of Apple's early Macintosh PowerBooks.

Just to be able to do so was quite remarkable.



The DCS200 certainly brought easy portability to digital capture, though it was not possible to see what you had shot until the camera was connected to a computer.

In 1994 Kodak introduced the DCS420 with another first – removable media in the form of a PCMCIA miniature hard drive the size of a



credit card but 1cm thick. This solved the problem of 'digital constipation' quicker than a dose of Senokot.

The cost was more expensive than Senokot, though – a 105MB PCMCIA drive was around £400.

No longer was it necessary to attach the camera to the computer to download images. A PCMCIA card reader enabled images to be downloaded separately, while the camera continued to be used.

The DCS420 sampled images using 12 bits – 4096 levels – rather than the 8 bits – 256 levels – of the earlier DCS cameras. This gave more latitude, making exposure not quite so critical as with earlier DCS cameras.

The DCS420 cost just over £8,000.

1995 brought the DCS460 – with a staggering 2036 x 3060 pixels – a total of 6,230,160. At 19 x 28 mm this 'M6' sensor was much larger than in any previous DCS camera and had a focal length 'multiplication factor' of only 1.3x. This allowed the effective use of wide-angle lenses for the first time.

This shot of a motorcyclist and London bus was made using a DCS460 on a cold rainy day in January 1995, in Hammersmith Road, Olympia, London, using a 15mm Nikkor lens – equivalent to 20mm on a 35mm SLR.

The DCS460 cost a cool £25,000 – over three times as much as the 1.5 megapixel DCS420. But then this camera truly was state-of-the-art, right at the bleeding edge of what was possible ten years ago.

1995 also brought the Fujix DS-515 (aka Nikon E2S) and Minolta RD-175 (aka Agfa ActionCam).

The Fuji/Nikon co-operative effort used a tv-sized sensor (6.6 x 8.8mm, 1000 x 1280 pixels) and relay optics to 'shrink down' the image produced by certain standard Nikon lenses designed for 35mm film cameras. A version with less RAM – the Fujix DS-505/Nikon D2 – was also available. Prices were £11,000 and £9,000 respectively.

The Minolta/Agfa co-operation also employed relay optics but used three CCDs – two for green and one for red and blue. The green CCDs were offset from each other by half a pixel to quadruple the resolution spatially and double the sensitivity. The camera produced 1146 x 1528 pixel images for around £8,500.

These somewhat quirky products did



Kodak DCS460

not sell in huge quantities but were significant: they were clear indications by other major film and camera manufacturers that Kodak would not always have the DSLR field to itself. Competition was coming.

PMA New Orleans 1998 was the event at which Kodak launched the DCS520, a DSLR based on the Canon EOS-1 body. Canon also marketed this camera as the EOS D2000. It employed a new 2 megapixel (1152 x 1728) sensor made by Kodak, had a shooting rate of 3.5fps in bursts of up to 14 shots and FireWire connectivity. It also had a colour LCD on which shots could be

reviewed and histograms studied. The DCS520 was a superb DSLR at £9,995.

That same year, 1998, Kodak's new entry-level Nikon-bodied pro DSLR was the DCS315, housed in a Nikon Pronea 600i APS SLR for £3,995. Unfortunately it also needed a front-of-lens 'Hot Metal' filter for each lens, to remove infra-red.

This and other essential accessories put the price up by another £995. And the sensor was only 1008 x 1520 pixels – 1.5 megapixels.

Later in 1998, Kodak announced the DCS560 – the big brother to the DCS520 with a 6-megapixel CCD producing 2008 x 3040 pixels and





costing around £20,000. Though still quite expensive, there is no doubt that the DCS520 and 560 were outstanding digital cameras.

At PMA Las Vegas on 18 February 1999 Kodak announced its DCS620, housed in a Nikon F5 body. The past year had all been about Kodak's Canon

offerings – perhaps for a reason.

Kodak and Nikon had been in talks – codenamed 'Maui' after the Hawaiian island – about manufacturing DSLRs jointly. Rumour had it that Nikon wanted a fifty-fifty deal but that Kodak insisted on a larger share. So Nikon and Kodak never reached agreement.



Kodak DCS ProSLR/c

The date of 18 February 1999 turned out to have a more ominous significance for Kodak, for it was on that same date that Nikon announced its 'Future Professional Digital Nikon' DSLR concept and showed a mock-up.

The gloves were off. Kodak were about to have real competition in the DSLR market for the first time.

August 1999 brought the first pre-production Nikon D1 to Seybold San Francisco, where I organised the Digital Photography Special Interest Days. With top speakers from both Kodak and Nikon on our panel, the atmosphere was electric. I had the first D1 outside Nikon hands to myself for the week – but it took less than a minute to realise that this camera was going to shake the Kodak DCS world.

Late in October 1999, the Nikon D1 was being advertised at £3,000 – one third the price of the Kodak DCS620.

Then, in 2000, Fuji came onto the DSLR scene with the S1 at only £2,300. In 2001 Canon produced its first own-produced DSLR, the D30, for under £2,000 and Nikon introduced the D1x.

Kodak launched the 6 megapixel DCS760 in 2001 at £5,900 – only a quarter of the price of its earlier 6MP cameras. The price had undoubtedly been forced down by the growing competition from Japan.

At Photokina 2002, the DCS Pro 14n was announced – the first DSLR to have a full-frame sensor. The specification looked excellent but the camera took a long time to come to market. When it did eventually appear, in 2003, it failed to meet its published specification and required frequent firmware upgrades.

The camera finally reached maturity as the DCS Pro SLR/n (Nikon mount) and DCS Pro SLR/c (Canon). With the latest firmware and software they are capable of producing excellent images. Sadly, these are now the last cameras of the Kodak DCS dynasty.

In the final analysis, Kodak's biggest problem was that it did not make the basic camera and optical systems. Kodak's electronics lived in bodies made by Canon and Nikon, like hermit crabs. When these companies entered the market with their own products, at very keen prices, Kodak's position was made infinitely more difficult.

**But we should never forget that it was Kodak which invented the DSLR and dragged photography – kicking and screaming – into the digital age.**