



**DIGIT 100**

## UPCOMING DIGITAL IMAGING EVENTS

Details of all Digital Imaging events are available on its website at [rps.org/groups/digital-imaging/](https://rps.org/groups/digital-imaging/)

### Digital Imaging: Online

Saturday 13 April 2024 @ 16.00 BST



#### Sean Bagshaw

Blending Frames in Photoshop

[bit.ly/RPSDIGOnline053](https://bit.ly/RPSDIGOnline053)

### RPS Digital Imaging: Online

Saturday 18 May 2024 @ 16.00 BST



#### Boris Eldagsen

AI and Photography: Latest Updates

[bit.ly/RPSDIGOnline054](https://bit.ly/RPSDIGOnline054)

### Digital Imaging: Online

Saturday 22 June @ 16.00 BST



#### Judy Hancock-Holland

Critiquing Photos: Your Own and Others'

[bit.ly/RPSDIGOnline055](https://bit.ly/RPSDIGOnline055)

### Digital Imaging: Online

Saturday 27 July @ 16.00 BST



#### Rad Drew

Creating Infrared Photos with your iPhone

[bit.ly/RPSDIGOnline056](https://bit.ly/RPSDIGOnline056)

### Digital Imaging: Online e-Circles

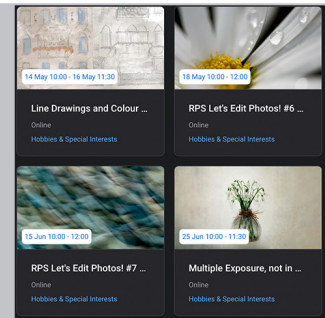


7 e-Circles  
Different themes  
Different times

contact [digmem@rps.org](mailto:digmem@rps.org)

### Digital Imaging: Online

various workshops



short 90mins to 2 hour sessions  
small number of participants  
tutor interaction & support

[www.rps.org/groups/digital-imaging/di-workshops](https://www.rps.org/groups/digital-imaging/di-workshops)

## Seed to Bloom - a project for a year

Pick 'n mix from talks, to workshops or even a trip to RHS Wisley

**Celia Henderson** - seasonal flowers 12 months of workshops

**Charles Needle** - Plant, Flower and Garden photography talk

RHS Wisley workshop with Charles and Melissa Needle

Online critique session with **Charles Needle**

Working with a Lensbaby - Polina Plotnikova

Shooting flowers with your iPhone - **Charles Needle**

Other workshops and critique sessions from RHS selectors

[www.rps.org/groups/digital-imaging/from-seed-to-bloom-project](https://www.rps.org/groups/digital-imaging/from-seed-to-bloom-project)

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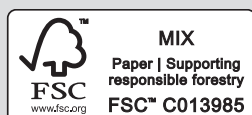
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by Hilary Roberts FRPS



# DIGIT

THE MAGAZINE OF THE ROYAL PHOTOGRAPHIC SOCIETY DIGITAL IMAGING GROUP  
Issue 100

## CONTENTS

- 2 **Group events**
- 3 **Contacts**
- 4 **Foreword**  
*Simon Hill HonFRPS*
- 5 **From the very start**  
*Hilary Roberts FRPS*
- 11 **The digital evolution**  
*Panikos Hajistilly*
- 17 **A working life in photographic printing**  
*Alan Hodgson ASIS HonFRPS*
- 21 **The end of the beginning ...**  
*Simon Hill HonFRPS*
- 26 **Colour management and how it has changed in the last 30 years**  
*DATACOLOR*
- 30 **A photograph is not an image until it's been printed for the world to see**  
*Robin Whetton - PermaJet*
- 33 **Surviving the paradigm change**  
*FUJIFILM*
- 36 **100 and counting**  
*Janet Haines ARPS*
- 38 **A final thought**
- 39 **In previous issues**

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# FOREWORD

Simon Hill HonFRPS

RPS President and Chair of Trustees



As a Society, in 2024 we celebrate several significant milestones including the twentieth anniversary of the granting of our Royal Charter (2004), the centenary of our Associate distinction (1924) and, of course, this one hundredth edition of DIGIT.

Not only is 'DIGIT 100' in and of itself such an incredible achievement but it also stands as testament to the immense expertise, the unwavering dedication, and the tireless efforts of the many volunteers of the RPS Digital Imaging Group. Since the Group's formation in 1996 (fast approaching its thirtieth anniversary) it is the patience and perseverance of these volunteers that have been the cornerstones of the Group's success. The Group and this journal have been the vehicles through which the volunteers have shared their passion for digital imaging, empowering their peers to embrace with confidence and enthusiasm an emerging and exciting new era of photography.

With the advent of digital imaging in the mid- to late-1990s and during the almost 30 years of the rapid rise in the domination of this technology in the world of photography, the Digital Imaging Group has supported thousands of photographers on their digital photographic journey. Some will have been supported as they transitioned from the traditional analogue techniques of the preceding 160 years;

others will have come to digital photography without ever having loaded a roll of film into a camera, let alone developed a comforting familiarity with the smell of 'hypo' fixer as they toiled for hours in a makeshift darkroom.

Through the pages of this one hundredth issue of DIGIT, as we reflect on the transformative impact of digital imaging on the world of photography, we recognise the pivotal role played by the art and craft of digital photography in shaping our collective visual narrative and opening new avenues for experimentation and innovation.

As we commemorate the milestone of DIGIT 100 and the contribution of the Digital Imaging Group to the photography journey of so many members of the RPS, let us not only celebrate the achievements of the past but also embrace the infinite possibilities that lie ahead. In the ever-shifting landscape of digital photography, there are no limits - only horizons waiting to be explored, moments waiting to be captured, and stories waiting to be told. The RPS Digital Imaging Group and DIGIT will continue to be important pillars of the delivery of that ambition.

On behalf of the Board of Trustees and of the Executive team, it is my great pleasure to congratulate the Chair and Committee of the Group, and all those who have gone before, on their service to digital photographers and to the wider Society ●



Carmen's House

## FROM THE VERY START

HILARY ROBERTS FRPS



Few of us are likely to remember when DIGIT appeared early in the history of the Digital Imaging Group. Hilary Roberts was a contributor to the very first issue of DIGIT, and played a major role in the Group for many years.

When I wrote a piece for the first edition of DIGIT, 27 years ago, the words 'Photoshop' and 'digital imaging' were terms of disdain and disapproval for many stalwarts of photographic societies around the country. 'Cheating!' was the comment most often heard, and many top club photographers vowed they would never abandon film.

But for me, although it was seriously stressful learning how to use it, this whole wonderful new world that had been shown to me by Barrie Thomas was a revelation and an amazing, electrifying, liberation. A chance to produce the images I would have been able to achieve if circumstances had been different. If the white van had not been there. If the sky had not been overcast and uniformly grey. If the subject had been wearing a bright red coat instead of a dreary brown one. If there had been a dog on the



Barrie's camera - the gift that started it all



Bereavement

pavement, or a pothole on the road. Or indeed, if the subject had actually been there, rather than in a different street, town - or even country.

Prior to the digital revolution I had been a nature photographer. This involved hours spent lying down in fields or standing in ponds, and a fortune spent on film. When the slides came back I would sit clicking them through the projector, hurling 98% of them, and a lot of money, into the bin because of an obtrusive white flower in the background or a *Fuji* blue spot on the only good one. With the power of *Photoshop* on my side I realised that I could develop a hitherto latent interest - environmental portraiture. This was not that different from nature photography, which had involved patiently following a dragonfly until it settled in an attractive spot. Now, I could find potential subjects with characterful faces, contrive to speak with them, chat them up, photograph them and relocate

them to anywhere in the world.

But none of this was easy. Slides that might lend themselves to manipulation were taken to *Boots*, where, for a considerable cost, they were put onto CDs. The CD went into the computer and then it was a matter of working out which pictures might be combined to produce a striking image. The finished result then had to be reconverted into a slide, so that it could be entered into competitions and exhibitions. After many unsuccessful trials using various labs (everything green or everything magenta) my photographic friend and mentor, the late Neil King, offered to undertake this task. Each of the images I had laboriously created would be about 4 MB and each image would need to be copied onto four separate 1.3 MB floppy discs and posted to Neil. He would, I never understood how, produce top quality slides from them, albeit at a cost of £17.00 each. Having to spend that amount

to produce one image would be expensive now, but twenty-odd years ago...

Manipulation took hours, days or weeks. Many times I heard the plea "Are we eating anything today?", from my long-suffering husband. There was no such thing as layers, so if you wanted to move someone from one side of the picture to the other, you had to cut them out, turn them round, and move them manually across. This left you with a hole where they used to be, and you then had to use your imagination and the clone tool to fill the empty space with whatever looked likely to have been behind them. Hours spent doing this did result in me becoming known as the 'Queen of Clone', and the use of the clone tool is still about the only *Photoshop* skill I use and am good at. Soon it became apparent that huge amounts spent at *Boots*, having slides put onto CDs would be better spent on a *Nikon* scanner and so began the next struggle up



Hallucination

the learning curve.

While in Crete I took some photos of a man who approached me in a park. When I arrived back home and saw the shots I thought he had a lovely face and set about finding the components of a finished image. He had told me he had recently lost his wife, so I placed him beside a cemetery on the other side of the island, and called the image 'Bereavement'. What looks like a simple picture took endless hours of fiddling on the computer, making him larger or smaller, moving him from side to side, tidying up the cemetery, etc. It was not good for my neck, but the finished result won many awards. My subject, however, was not amused. When I took him a big print the following year it turned out that by some amazing coincidence I had picked the very cemetery where his wife was buried - and he thought I was trying to suggest that it was time he joined her.....

Soon, digital cameras arrived and more was to be learned and understood. Quite early on, Barrie Thomas gave us his first digital camera, a Fuji MX-700. With 1.5 megapixels and a 16 MB *SmartMedia* card; it is still working today. At that time it seemed that practically every week manufacturers brought out new, improved versions of their digital cameras, and with them the need for more and different accessories. Digital photography was certainly much cheaper in that there was no need to spend a fortune on film; however wherever photographers met together there was always someone explaining the necessity of purchasing this or that wonderful new technological development. At one point Peter, my husband, spent £1,000 on a 1GB *IBM Microdrive*, a Compact Flash card which fitted into the camera and enabled one to take more pictures than was imaginable at the time.

Only a year after that first issue

of *DIGIT*, in 1997 I achieved a Fellowship of the RPS with a panel of digitally produced slides. Sadly, I have since managed to lose the slides and I have no record of my submission, but I am pretty sure they included one featuring the famous 'blue man', who used to be a living statue in Bath. No longer dressed in blue he, together with a sky from Goa, some mud from Yorkshire, a tree from Brazil and my stepdaughter, made a very successful image called 'Hallucination'. I seem to remember spending several days struggling to alter the angle of his hand.

I had not realised I was at all competitive until I was introduced to the world of photographic societies and now, with creativity having no bounds, there was no stopping me. I embarked on gaining FIAP distinctions, finally achieving a MFIAP in 2003. This was gained with a panel of prints. Although it soon became possible to produce projected



*Urban Fox Aggression*

images instead of slides, and clubs gradually, and sometimes reluctantly, began to accept these, I have never really felt happy with them. If I produced a print myself I knew that exhibition selectors would see exactly what I posted

to them. Projected images, on the other hand, could look wonderful or dreadful, depending on the compatibility of our relative equipment.

My MFIAP panel was all about Cuba, a wonderful country which I

discovered in about 1999. I thought I had died and gone to heaven when I first went there and saw its potential for stunning images. Barrie Thomas was now a close friend and he joined us on trips to Cuba several times. By now we, and





*Til Death us do Part*

most other serious photographers, were routinely using digital cameras. But I remember clearly that although Barrie had visited practically every photographic club in the UK with the intention of convincing every member to adopt the new technology, on at least one of these trips he had still brought a film camera and was using it for preference. He endured a constant barrage of bemused comments about this from me.

One of the images in my MFIAP panel was a lady set against a background of a typical Cuban interior. She actually approached me in the street and asked me to take her photo. I took it to give her the pleasure of seeing herself on the back of the camera, but I did not think I was likely to use it. However, when I looked at the image on returning home I loved her expression, and she fitted well

into the rather dim, greenish living room (see Carmen's House, page 5).

All through this period my husband, Peter, and I were heavily involved in helping to run the Midlands Digital Group, an offshoot of the RPS started by that brilliant photographer the late, Eddie Sethna. I have never forgotten Eddie asking us to go over to his house to teach him 'how to do *Photoshop*'. We went over there and showed him how to plug the computer in, and a few basic techniques. Within about a fortnight, it seemed, he knew everything there was to know, and his expertise was phenomenal. MiDIG, as it was known, met every two months in Birmingham, in the later years at Smethwick Photographic Society's HQ, The Old Schoolhouse. Experts were recruited from all over the country to instruct us in the latest digital

techniques and we had over 300 members. At the same time Peter and I were both on the committee of the RPS Digital Imaging Group, and the highlight of each year was the Digital Spectacular we organised at Rugby, with participants from all over the country, workshops, stalls and a star speaker, sometimes from abroad.

Gradually, digital cameras improved, digital photography became mainstream, and few people now describe it as cheating. Over the years instead of my heavy Canon camera I switched to a small Sony, and I continued to have reasonable success in competitions and exhibitions. The two humans and the dog in one very successful image called 'Til Death us do Part' were all in Cuba. And they were even all in the same town. But other than that, not connected in any way.

These days I don't belong to a club



*Stop waking me up*

and I don't enter competitions or exhibitions. I am still keenly involved in photography because I sell my work to support a little Cuban boy. Eddy was born healthy, but contracted meningitis at a few months old. He survived, and is now thirteen, but he has very severe disabilities. I sell 'chocolate box' images of my town of Leamington Spa which, I am rather horrified to say, I often take on my phone, and other pictures from around the world, such as the Cuban picture, above, of a little girl expressing her displeasure to a cockerel (which wasn't there).

I still do a lot of cloning because the local images need all sorts of things taken out of them, such as lamp posts, rubbish bins, traffic lights and no entry signs.

The hardest challenge is removing cars which ruin every view wherever

you look.

So I still have to go out at 5 am.

These days I don't see myself as a photographer so much as a picture maker. Or perhaps some would say, a picture faker. However, I never introduce any element into a picture which did not originate in my camera or phone. I enjoyed photography before I went to Solihull Photographic Society that winter's night and heard Barrie Thomas talking about Photoshop. However, I think it is fair to say that the arrival of digital photography actually revolutionised my life. Taking photographs and 'fiddling' with them to achieve my desired outcome has been a constant, immense pleasure and satisfaction over the 27 years which have elapsed since that first edition of DIGIT.

And that brings me to the last

picture in this look back over the years, my all-time favourite. Foxes visit our garden every night, so I was able to produce a nature picture, which I called Urban Fox Aggression (see page 8) ●

#### See more of Hilary's work

To see more of Hilary's work or to support Eddy, visit her website at [hilaryrobertsphotography.com](http://hilaryrobertsphotography.com).



*This is a hand-held image taken with a very wide aperture. A few years ago image stabilisation was very hit and miss. Now we can take photos at insanely low shutter speeds and still get perfectly sharp and un-shaken images.*



## THE DIGITAL EVOLUTION

### PANIKOS HAJISTILLY

**Panikos Hajistilly looks back over more than 40 years in different roles in the photographic industry, and the changes that have led to his current business.**

Although I am now a full time photographer, and have been for the last 20 years or so, the first part of my career was in camera repairs. I started off as a teenager working on Russian cameras like the Zenit, Zorki and Fed, among others. After a couple of years I joined JJ Silber who used to import Canon cameras as well as a host of other photo products. I moved to Canon UK when it was formed in the early 1980s, and I joined Olympus around 1984. I then joined Nikon in 1987.

In each of these companies I was employed as a camera technician, repairing all sorts of equipment from compact cameras, SLRs from budget to seriously professional, lenses, flash guns, underwater gear, motor drives and all manner of accessories. I was workshop supervisor for the last 10 years of the 15 that I was with Nikon.

It was while I was at Nikon, though, when the digital evolution/revolution began. During the late 1980s and early 1990s, a machine

called the Nikon NT1000 was introduced, which was a film scanner, complete with its own telephone handset. It was in effect a souped-up fax machine, that could scan black and white negatives and transmit them to a suitable receiver over copper telephone lines. A number of newspaper offices used them, especially for press and sporting events. Then came little digital cameras, with a 0.3 megapixel sensor, called the Coolpix 100. Gradually the

• • • • • 1984 Inkjet printers commonly available • • • • •



*This is a single capture, taken by balancing the ambient light in the ballroom, with the flash power required to freeze the subject in mid-air. Portable flash is now so powerful that we can do almost whatever we want lighting wise both indoors and outside.*

sensors got bigger and better and eventually the film SLRs gained digital sensors becoming DSLRs.

Just before that though, I remember working at the Wimbledon Tennis Championships. The photographers would take their B and W films to the toilets in the depths of Centre Court to develop them as quickly as they could, then dry the uncut rolls of film with hair driers, before racing upstairs to the Nikon service area, where an NT1000 was on standby. They'd choose their favourite photos with a loupe on a light box, then cut them out and feed them into the scanner/transmitter. It was always first come first served, and in hindsight it was quite comical watching the frustrated photographers grappling with this new tech, as the telephone line would cut out unexpectedly and they'd have to start all over again. All the while, other shooters were waiting in line knowing that

very soon they were going to miss their deadlines!

Mainstream digital cameras and mobile phones were but a dream in those days. Having said that, I remember attending the Albertville Winter Olympics in 1992 with Nikon, there, I saw some digital dye-sublimation prints made with a 'revolutionary' Kodak digital camera, based on either a Nikon or Canon film SLR. The photos were of ice skaters, the print was about 6x4" in size, with a considerable amount of 'jaggies' on any diagonal/curved lines in the photo. Oh how things have moved on!

### **My first studio**

It was early 2002 and I was itching to set up my own studio. I decided to leave Nikon and to set up my own Venture portrait studio. Before setting my studio up, I visited a few established Venture studios in various parts of the country. Most

of these were 'hybrid' digital, in that they would shoot on colour negative film, send those off to Venture's lab who would scan them and send back a CD with the digital scans/files from the film. They would then use those files to show the clients their images on the studios customised viewing software, and when the order was placed, the lab would produce the frames or prints from the scans they had on file.

There were also other ways of showing clients their photos, like 'trans proofs', but that's another story. Having seen the rather cumbersome and very expensive (due to the cost of film and scanning) way the hybrid system worked, I decided to go with the cutting edge camera of the time, the Nikon D1X Mk2 at a whole 5.7 megapixels! The Venture hierarchy wanted franchisees to purchase the Phase One backs on a Yashica medium format camera, which was

a particularly expensive proposition. As I was working at Nikon, I managed to purchase a couple of D1X Mk2s with staff discount together with a few lenses, and I set up my all digital workflow studio! Of course this was in addition to converting the premises I acquired from a second-hand car showroom to a rather smart, two-camera room, two-viewing room, studio at the cost of some £250k!

### Setting up my digital only studio

Of course just having the cameras is only part of the story. The whole digital workflow has to be built around them! At that time I was completely clueless about how to set that up, but with the help of the photographers that I had employed who were fresh out of university, and understood Photoshop which had reached version 7 at the time, at the cost of around £800 per copy, we got things up and running!

That was a very steep learning curve! Not only did we have the digital photographic technology to deal with, but also the paper management system (then eventually software) to utilise.

### First kit

So, armed with our D1X Mk2s, we thought we had the best, and indeed we did for a little while. But soon the shortcomings were becoming apparent. Those cameras, as did all digital SLR cameras of the time, had cropped sensors (approx 16x24mm instead of the 24x36mm 'full frame' sensor) which meant that our 'standard' lens in our relatively small studios were the 16-35mm lens, which gave us the full frame equivalent of around 24-52mm.

At the time I couldn't understand why the image quality was sometimes so poor. We had issues like colour fringing, a general flatness or lack of contrast to the

images. We had lots of moire with certain materials that our clients would wear, and when someone ordered a 30" print I couldn't work out how to get the image any sharper! Of course, now we know that shooting only in JPEG, at  $f/11$  to  $f/16$  'to get everything in focus', is actually degrading the image with a lack of dynamic range and copious amounts of diffraction which made the images look so soft! We didn't know how to remove colour fringing or moiré in Photoshop - or indeed if those tools existed then! These are all things we now take for granted, but there was a lot of head scratching going on in those days!

### Move with the times and technology

My frustration with image quality came to a head after a couple of years. I was constantly looking at the new developments in the photographic industry, and noticed



*An image that 10 or 15 years ago would have been almost impossible to capture. With modern sensors 'noise' is no longer an obstacle to getting good images with lovely colours.*



*This was taken almost 10 years ago, when we were pushing the limits of our sensors at ISO 1200, though the image is acceptable, newer sensors have no problem dealing with such low light levels.*

that Canon had brought out full frame DSLRs with double the pixel count of my Nikons. I spoke to a few 'friends in high places' at Nikon HQ in Holland, and sadly they confirmed that Nikon wouldn't be going down the 'full frame route' as they felt that 'using the sweet spot of the lens, and getting the best colours was more important'. So armed with the information that no full frame cameras were on the horizon from Nikon in 2004, I decided to sell all my Nikon gear and switched to the Canon EOS 1Ds Mk II, with a 16.7mp full frame sensor. I remember making one Jessops salesman very happy when I placed an order for £35k for 2 bodies and 6 lenses.

The difference was astounding! Image quality was much better, we were using 24-70 f/2.8 lenses and Photoshop had been updated and the newer version offered many enhanced features - which all added up to us selling much improved

quality products.

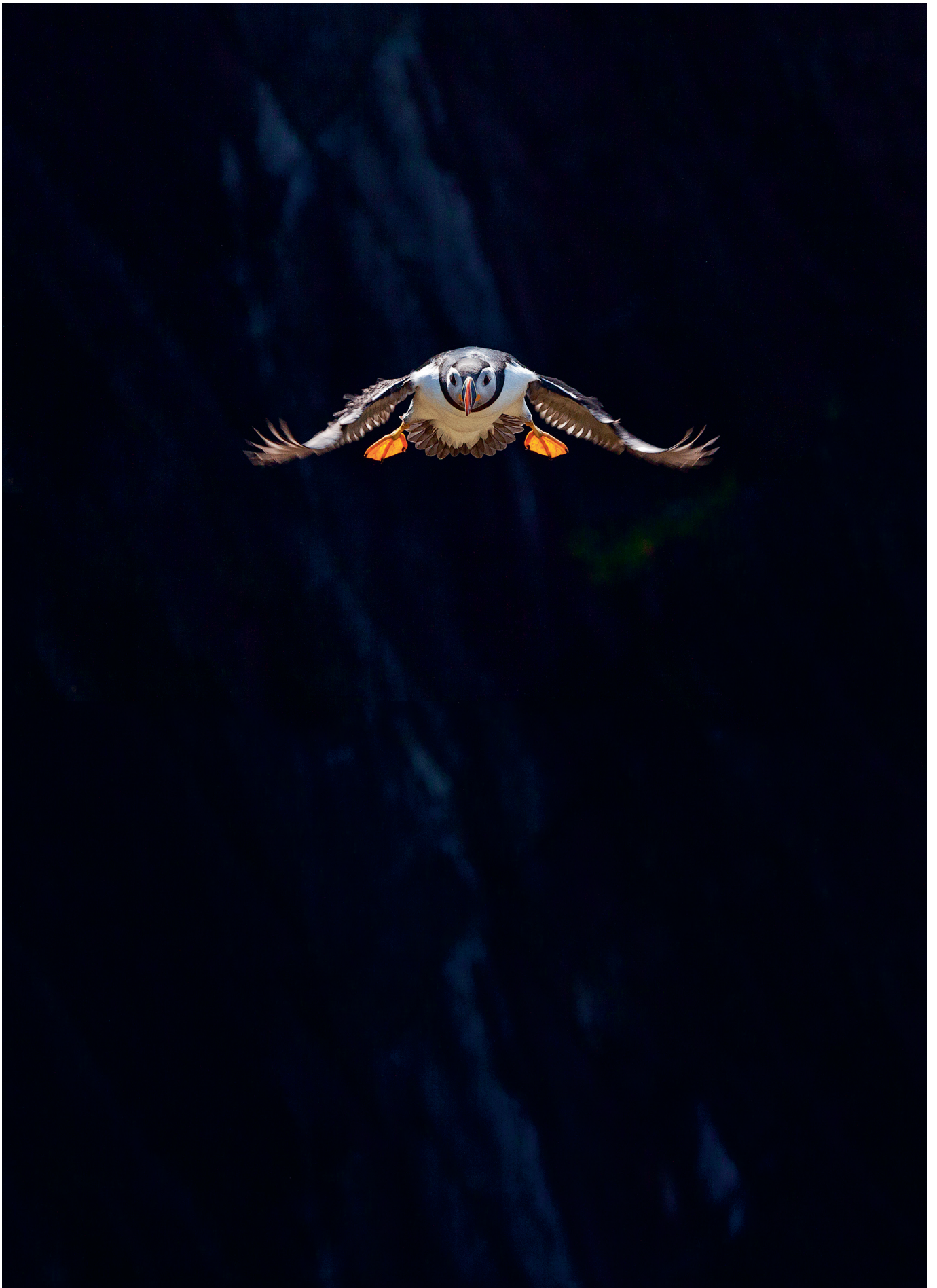
As the business grew, I was spending less time in the studio and more time 'managing', doing business planning, accounts, endless meetings and dealing with staff issues. That wasn't really what I imagined I'd be doing a few years earlier. So when the financial crisis hit and the economy took a downturn, I chose to sell the business and go it alone. So I did that in the late summer of 2009, and went completely on my own.

#### **Workflow then vs. now**

So, at that time I was without a studio, I sourced customers using the Master Photographer Association's Cherubs scheme. I was able to mail shot (using 'snail mail') new mums, offering to take photos of their babies. But without premises, I had to hire hotel conference rooms and sports clubhouses, and create mobile studios to photograph my clients.

I would set up early in the morning with my backdrops and lighting sets, and take sample frames, albums and prints. My daughter was downloading the clients' files onto my laptop and arranging a time for me to show them their photos in the comfort of their own homes. Starting at 10am and having 30-minute photo shoots, I was photographing up to 16 clients in a day! I would then visit them, on the day and time booked in by my daughter, and show them their photos on my laptop. Once they'd placed their order, I would work on the images, do any retouching and editing, get them printed and then deliver them to the homes again.

At this time, I switched from the Canon EOS 1Ds Mk II to the EOS 5D Mk II, which had an excellent sensor for the time, and was lighter than the EOS 1 series cameras. I did all my editing in my spare bedroom at home, but was always keeping up to date with the latest



*This image shows what can now relatively 'easily' be done with an autofocus camera.*

• • • • • 1987 Photoshop was developed by two brothers - Thomas and John Knoll • • • • •



*Dynamic range available from modern digital sensors permits great creativity*

developments in the photo industry and was continuing to educate myself with online learning.

After a while, the constant setting up and breaking down of my mobile studio, and setting off in an estate car full to the brim with gear every five to six weeks for shoots, and then travelling to everyone's homes twice each (first to show and then to deliver the photos) was taking its toll on me. So I started the process of applying for planning permission to build a studio at the back of my house. I designed a 10x6m

building on a piece of A4 paper, where I worked out how big a studio (camera room), viewing room and office I wanted. I finally got approval and built my studio late in 2012, with my first clients coming in during January 2013.

Continuing with my quest for the best quality of image possible for my available funds, and having invested heavily into Canon L series lenses, I upgraded my cameras to the Canon 5DS R and currently the R5, where I switched over to RF lenses too.

With the bigger sensors the need for bigger backup drives became necessary very quickly. And, after having had a few close shaves when I had my Venture studio, where my Drobo backup drive crashed on a couple of occasions - and only my second backup saved the business - I studied how best to store my data. I settled on a Synology RAID, where I currently have an eight-drive unit, and any two hard disks can fail without any loss of data. This is in addition to an OWC Thunderbay that is directly attached to my 2019 Mac Pro. As if that wasn't enough, I also have five other individual backup drives that I only connect every week or so, and as soon as they back up, I disconnect them completely from my computer and network. This is so that should I ever get hacked or infected with a virus or some form of malware, something that happened to a colleague, I can wipe everything on my system, and work from those 'cold storage drives'. I consider everything directly connected to the network is 'hot storage', and any hot storage can be infected with viruses and malware.

So now here we are, in an age where not only have we as photographers taken on the jobs of most retouchers and photo lab technicians, but we have to have a measure of IT knowhow to keep ourselves in business.

How lucky we are to be photographers in the 21st century! ●

**See more of Panikos's work**

To see more of Panikos's work, visit his website at [panikosphoto.com](http://panikosphoto.com).





The analogue prelude. Alan's camera and prints c1996. The shadows were lengthening...



## A WORKING LIFE IN PHOTOGRAPHIC PRINTING

### ALAN HODGSON ASIS HonFRPS

Familiarity and the photographic print - how we broke the link. Alan Hodgson explores the events since 1998 and his observations on the way.

#### Prelude - not much is really new

I count myself amongst the lucky ones who started their career in analogue photography then chose, made and survived the transition to digital. But more importantly, I kept feet firmly in both camps, working in both domains pretty much my whole career. The thread that joins the two is the production of photographic prints.

This hybrid approach is a story in itself - it appeared in DIGIT issue 83. I joined the photographic industry in 1982 as a scientist with Ilford Limited,

then a manufacturer of black and white films and papers. Even in those days the photographic industry was in transition - the only thing that seems to have changed is that these waves of change have washed over us at increasing speeds. This has had significant impacts on the consumer uptake of the photographic print, which is a central message of this article.

The electronic camera was already with us in 1982 in the form of the Sony Mavica, putting the future of photographic film in question. 1983

saw peak sales volumes of black and white photographic papers as commercial users switched to colour in increasing numbers, Ilford responding by the reintroduction of colour film sourced from a Japanese manufacturer. And 1984 saw the introduction of monochrome desktop inkjet which caused an analysis of the strategic direction in *Ilford* and a group of us to investigate this digital domain.

Various short-lived Ilford products followed, but probably the most notable one was the introduction

1991 Kodak, the film-maker, made the first commercial digital SLR - the DCS100



Alan's cameras and print media c2002



....and how it had changed by around 2004

of the *Printasia* brand, first with a digital imaging system in 1994. This was what we would now call a workstation, consisting of scanner, computer, printer and software. It only had limited success (marketing euphemism for a commercial failure), but brought with it one significant learning point. Computer

hardware and software had become a constantly changing technology which rendered this workstation obsolete very quickly. This was a scenario we became increasingly used to.

Around this time I made a move into photo marketing, monitoring the photo press for strategy clues,

and finding some warnings of the storms ahead. While digital had some real advantages such as software retouching, the potential for manipulation started to raise ethical concerns across a spectrum of use cases, from competition entry to journalism. But also, of the damage that this transition could do



Modern digital print production © CEWE

to the established photo industry, a prescient thought as the shadows were lengthening over us.

The launch of the RPS Digital Imaging Group in 1996 seemed in response to the transition of camera club photographers to digital cameras. But for me it meant something different - the Digital Imaging Group was the name of a powerful industry consortium working to similar ends but with the financial backing of 'old photo' in *Kodak*, *Fuji* and *Canon* plus the 'new wave' of *HP*, *Intel*, *Adobe*, *IBM* and *Microsoft*. Over the next four years they tried out strategies, until they were in turn folded into the International Imaging Industry Association (I3A). In another role, I worked to transfer part of the photo ecosystem out of I3A before they disbanded in 2013. This was how the industry had become.

### The first hit to familiarity - DI

The years around 2000 proved to be pivotal to the photographic print

industry. To fully appreciate the cause of this, we need to look back right through the 20th century as the *Kodak Brownie* camera came to market in 1900. Through the first 60 years, processes and companies came and went, but by the 1960s commercial colour negative film and processing was a mainstream product. We can take this point in time as indicating some level of maturity in the photo market.

The important point here is that for around the next 40 years there were decades of relative stability in photographic practice. Familiarity comes with use and time in a market is a big driver in this. The result of this stability in practice was familiarity - users knew what to do. How to buy film, get it processed and printed, turnaround time, quality expectations etc were all established and familiar to the users.

Digital became mainstream in consumer photography very quickly, and at that point everything

changed with an explosion of options available to the user. Prints, long the mainstay of this market, could be easily printed at home on inkjet printers or ordered online, and the resultant quality was very variable. Images born digital could remain digital; viewed on screen, stored on PCs and CDs, and shared by email.

This explosion of options had many results and here we should start to consider the learning points from this process. Established companies like *Kodak*, *Ilford* and *Polaroid* experienced significant dislocation to their business models, and some ceased to exist. Insurgents like *HP*, *Sony* and *Panasonic* entered the market and displaced the establishment.

But from a user perspective, familiarity was a major casualty. In the early 2000s there was not the level of computer technology and display that we are used to 20 years later. Users were accustomed to

having prints, and all of a sudden they were facing a whole new process to achieve this.

Market surveys at the time showed a substantial proportion who had no idea if their local retailers could produce prints from digital files. As a result, many users kept their film cameras for special events where they deemed the familiar route to a print to be important. There was confusion, too, over the relative advantages of home printing, online photo services or not printing at all.

This situation was not helped by the different marketing claims from the players in this market. Some were promoting desktop inkjet printers and paper for home printing, others internet photo print service, while some were providing equipment for home storage and display. In retrospect, it is no wonder that users lost the sense of familiarity and became confused as to the way forward.

Most markets faced with the introduction of disruptive technology hit a 'pivot point' - the point in time where the market tips rapidly to the new way of working. A good indicator of this was given by Photokina 2004, then the world's largest photography trade fair. Even though older, established companies were closing, from a retail perspective total sales were growing, driven by the new digital cameras. But the second hit to the business and familiarity arrived - the coming of the cell phone with a built-in camera.

### **The second hit to familiarity - the camera phone**

By 2004, digital cameras had become mainstream as a consumer item. For the most part these still looked and felt familiar as they were designed to look like previous generation, film-based compact and SLR cameras. However, just as consumers were embracing the new digital technology, another disruptive technology arrived in the shape of the cell phone camera.

The effect of this further innovation was dramatic. In the course of a very few years, cell phone cameras displaced the emerging market for compact digital cameras. Further innovation followed with more new industries entering the 'camera' market, most notably with the smartphone a few years later.

The response from the photographic retail segment around 2004 is enlightening and worthy of consideration. There was still a belief that consumers would return to physical prints, in an attempt to return to the decades of relative stability. It was not considered that breaking that linkage to familiarity twice would result in a change of behaviour.

It did; physical prints as a mass market industry ceased to exist, as did large elements of the supply chain and the photographic industry as we knew it. I, amongst many others, lost our positions in a sea of insolvency. But a number of us found our place in the photo print ecosystem that grew from there.

### **Familiarity - not much is really new**

Over the intervening 20+ years, I have researched and written about this transition. The key point for me is that Familiarity was the consumer driver we missed, and it is incumbent on us to think long and hard as we repeat this. I have become a reader of philosophy, and I hope to disagree with Georg Hegel - "We learn from history that we do not learn from history".

The photographic industry and consumers enjoyed 40 years of relative stability with colour physical prints, and the result was familiarity with both the process and product. This was followed by waves of technology innovation and insurgents that swept away this familiarity as collateral damage to progress. The lesson of history is that we have similar risks as we consider the transitions that will inevitably continue.

Twenty years ago *Ilford* and I went our separate ways, but I stayed in photographic printing, first on inkjet technology and then on portrait printing for identity documents. The photographic print looks set to stay with us, irrespective of the content, be it 'real' or generative. Although the percentage of images printed is lower than it was, the market by volume is on the increase again.

Not much is really new... ●



Almost every aspect of life is now photographed on a smartphone and can, via the web, be shared instantly with the world. COP26, Global Day of Action, Glasgow (6 November 2021). Credit: Simon Hill HonFRPS



## THE END OF THE BEGINNING ...

**SIMON HILL HonFRPS** RPS President and Chair of Trustees

As President of the RPS, Simon Hill spends much of his time looking to the future...of both the Society and photography. But he still has time to look back, and to wonder how much has changed in a few short years.

As the Learned Society for photography and the national body representing photography and photographers in the UK, the Royal Photographic Society (RPS) has since its formation been at the vanguard of providing education, training, and support at every milestone in the evolution of the medium. Founded in 1853 to promote the knowledge, understanding and appreciation of photography, today the RPS has an international membership of over 10,000 student, enthusiast, fine art and professional photographers. The RPS is structured as a collegiate

system of Groups representing a diverse range of photographic genres, technical disciplines and academic interests.

The RPS Digital Imaging Group (DIG) is one such Group; in fact, with over 1700 members, it is our largest Group. DIG was formed in the summer of 1996 in response to the rapid advancement and transformative impact of digital technology on photography. As digital photography gained prominence, it became evident that a dedicated Group was necessary to explore, promote, and educate RPS

members in this new photographic technology.

Essentially, the ambition of DIG was to help members transition from the analogue photographic equipment and processes that had characterised the first 150 years of photography, to the rapidly emerging digital technology. In support of this ambition, from its formation DIG published its own magazine - DIGIT - edited by Barrie Thomas FRPS. In the cover feature of Issue One the RPS President, Robert Moore HonFRPS, explained why he felt such a Group was

necessary: "one of the reasons for this is undoubtedly the accessibility of the personal computer. I'm sure it won't be too long before a PC will be as commonplace in the photographic armoury as an enlarger is at present". How right he was!

### The genesis of digital photography

In February 1880 engineers Alexander Graham Bell and Charles Sumner Tainter announced the 'photophone' - a device that converted speech into a modulated beam of light. Later that year, the English physicist and inventor Shelford Bidwell FRS adapted Bell and Tainter's invention to convert an image into analogue data that could be transmitted as an electronic signal. Bidwell called this 'telephotography' and it became the precursor to electronic (and ultimately digital) photography.

However, in 1957 the first digital (rather than analogue electronic) image was produced. Russell Kirsch, an engineer at the National Bureau of Standards in the United States, used a very early computer to create a digital scan of a conventional photographic print. The image was a photograph of Kirsch's three-month-old son, Walden (see top), and was produced from a composite of two binary scans that enabled an approximation of grey levels. So significant was this achievement that in 2003 Kirsch's digital image of his son was named by *Life* magazine as one of the *100 Photographs that Changed the World*.

Following Kirsch's creation of this first digital image, the technological development of the elemental components of digital photography progressed at pace. One of the most significant developments was reported on 16 April 1967 in *The Observer*, by science correspondent John Davy. His report described the groundbreaking work of Peter Noble, an optics and sensors engineer at Plessey Research.



*The first digital image; produced by Russell A Kirsch, a composite scan of a conventional analogue photograph of his son, Walden (1957). Credit: Russell A Kirsch*

Noble's 'active image sensor' used a photodetector to convert light into digital information; for the first time it was possible to create a digital image from life (see below), without any intermediate analogue stage.

It would only be a matter of time before the charge-coupled device (CCD) image sensor, invented by physicists Willard S Boyle and George E Smith at Bell Laboratories in 1969, would allow for the development of a true digital still camera. In the meantime a British engineer, Mike Francis Tompsett, used CCD sensor technology to take the first published colour digital photograph. It was a photograph of his wife, Margaret, and it was



*Peter Noble's equipment enabled, for the first time, the capture of a digital photograph from life (1967). Credit: Plessey Research*



Kodak DCS-100, based on the Nikon F3 camera with a retro-fitted Kodak KAF-100 1.3MB sensor, with its portable Digital Storage Unit (1991). Credit: Marc Aubry (@maoby / Flickr)

published on a 1972 cover of *Electronics Magazine*.

The first true digital camera, albeit recording only black-and-white images, was created in December 1975 by Steve Sasson of Eastman Kodak. It was constructed from a movie camera lens, a Fairchild CCD sensor, a selection of Motorola components, and required 16 batteries. Weighing over 3.5kg, the camera recorded images to magnetic tape at a resolution of only 10,000 pixels (0.01MP) and required an exposure time of 23 seconds. In 1981 Sony began to prototype one of the first mass produced portable film-less cameras, the Sony Mavica, which recorded an analogue (not digital) video image onto a magnetic disk, hence the name (**MA**gnetic **VI**deo **CA**mera).

In 1986, the first digital single-lens reflex (DSLR) camera was announced, the prototype Nikon SVC, followed in 1988 by the Nikon QV-1000C. In 1991, the first commercially-available DSLR, the 1.3MP Kodak DCS (built around the Nikon F3 film camera), was launched at a retail price of \$20,000 (see above); less than a thousand were sold. While several other manufacturers began to develop

and bring to market their own digital camera, in 1997 Sony released its first consumer digital cameras (retaining the Mavica name of its earlier analogue cameras). These were the entry-level FD5 (with a fixed focal length lens) and the more versatile FD7 (with a 10x optical zoom lens) (see right).

It was on 15 June 1999 that arguably the most significant milestone in digital photography was reached; the introduction of the Nikon D1, the world's first professional DSLR camera (see below). The D1 had a 10.8MP image sensor but software read the data from groups of four pixels, thus reducing its resolution to an effective 2.7MP sensor but with enhanced low light capability. At the launch of the D1, nature photographer Bjørn Rørslett declared this moment to be "The end of the beginning of the digital era; the beginning of the end of the film era".

### Digital photography for mass communication

Although the launch of the Nikon D1 was hugely significant, there were two earlier technological developments that had a significant impact on the future direction and popularity of digital photography... these were the world wide web and the smartphone.

In July 1992, a band called *Les Horribles Cernettes* gave a performance at CERN, the European Organisation for Nuclear Research, in Geneva. The band was formed by



The first professional DSLR; my very heavily-used and somewhat battered (but still fully operational) Nikon D1, now in the RPS camera collection (1999). Credit: Simon Hill HonFRPS



Sony Digital Mavica FD7 (1997). Credit: Simon Hill HonFRPS

CERN employees Angela Higney, Michele de Gennaro, Colette Marx-Neilsen, and Lynn Veronneau. Before the band went on stage, their 'manager' and CERN physicist, Silvano de Gennaro, posed the foursome for a photograph (taken on film). After the performance, Gennaro scanned the photograph and saved it as a .gif (Graphic Interchange Format) file on his Apple Macintosh computer. Using a new photo editing program, called *Photoshop*, Gennaro cut out the band from his scanned image, pasted it onto a graduated blue background, and added some graphic text (albeit in a rather dubious font).

A contemporary of Gennaro was Tim Berners-Lee, a former employee at Plessey Research then working at CERN as an independent contractor. Berners-Lee was developing a hypertext-based internal communications network that would eventually become the World Wide Web. When 'TimBL' - as he was known - saw Gennaro's 'Photoshopped' picture of *Les Horribles Cernettes* (see next page top) he had the idea to make a 'webpage' to report the band's performance and to promote the band to other employees at CERN. He added Gennaro's image to a simple text page and, although only 120 pixels x 50 pixels, this postage stamp sized digital image of the *Cernettes* became the first ever photograph to appear on what would soon become the World Wide Web.



*Les Horribles Cernettes; the first photograph to be published on the World Wide Web (1992). Credit: Cern Music Club*

Around the same time, several concepts were being imagined for a mobile phone incorporating a camera. In 1993, there was Daniel Henderson's 'wireless picture phone technology' called the *Intellect* and, in 1995, *Macworld* magazine published a very conceptual piece about what an Apple video phone might look like ... it combined the look of the company's Newton PDA (Personal Digital Assistant) with a built-in video camera and display. Despite considerable interest, these ideas remained nothing more than attractive concepts. However, on 11 June 1997, the birth of a baby girl in Santa Cruz, California, provided the impetus for a functional technology that would allow everyone to instantly 'make and share' photographs with the world.

When the wife of Philippe Kahn, a French engineer, was admitted to hospital to give birth to their first child, Kahn wanted to take pictures of his newborn and share them immediately with family and friends. In the hospital labour room Khan had with him a Casio QV-10 digital camera, a Toshiba 430CDT laptop, and a Motorola StarTAC flip phone. This is where the story becomes

truly remarkable.

Clearly with nothing else to occupy his time, while his wife was enduring an 18-hour labour Kahn was thinking how he could connect his digital camera to his mobile phone via his laptop, so he could share photographs within seconds of taking them.

In 1997, mobile phones couldn't

connect to either laptops or to cameras but Khan had a StarTAC speaker phone kit in his car which, of course, did connect to his phone. Although at this precise moment, his wife may not have been in the best frame of mind to make a considered judgement, he later recalled that she gave him her blessing to, 'run down to the car, take out the whole speaker phone kit and start working frantically at creating a software-firmware-hardware interface' that enabled him to send pictures from his camera, via his laptop and phone, using the speaker phone kit to connect it all together.

Khan managed to complete this technological innovation a few minutes before his wife gave birth to their daughter, Sophie. He was able to use his camera-phone-laptop combination to take a digital photograph of the newborn Sophie and send the picture, instantly, to two thousand of his family, friends and work colleagues. Although, like the earlier concept projects for camera phones, Khan's invention never made it into commercial production, it did signpost the inexorable direction in which popular photography would now move.



*Phillipe Kahn's photograph of his newborn daughter, Sophie, was the first digital photograph to be shared instantly via mobile phone (1997). Credit: Philippe Khan*





A 'bag full' of camera lenses in one pocket-sized unit; the three lenses of the 48MP Apple iPhone 15 Pro Max (2023). Credit: Simon Hill HonFRPS

Kahn had taken not only the first photograph of his newborn daughter but had created the first working and publicly-demonstrated camera phone. Such was the significance of this moment that *Time* magazine included Khan's 320x240 pixel photograph of Sophie (see previous page bottom) in its November 2016 list of the *100 Most Influential Photographs of All Time*. This very small and very low-resolution baby photograph sits alongside Alfred Eisenstaedt's photograph of a US sailor kissing a nurse 'V-J Day in Times Square' (1945), William Anders' Apollo 8 photograph 'Earthrise' (1968), Nick Ut's 'Napalm Girl' (1972), Richard Drew's 'Falling Man' taken on 9/11 (2001), and of course, 95 other all-time photography greats.

### The future of digital photography

It was not until 1999, around the time of Sophie Khan's second birthday, that the first commercially-available camera phone was released; the Kyocera Video Phone VP-210.

Twenty-five years later and the camera phone (today known as a 'smartphone' as they do so much

more than take photographs and enable telephone calls) has become the ubiquitous technology of the twenty-first century.

The smartphone has almost completely eclipsed the conventional camera; the Apple iPhone 15 Pro Max (see above), for example, is equipped with three high quality lenses that between them offer the equivalent of seven conventional lenses: macro, 13mm, 24mm, 28mm, 35mm, 48mm, and 120mm (full frame equivalents), enabling image-stabilised photography with a resolution of up to 12MP (at the extreme focal lengths), 48MP (from 24-48mm focal length), and 63MP (in panoramic mode).

Worldwide in 2023, over 57,000 photographs were taken every second, 5 billion every day (which is more than all analogue photographs taken during the entire history of photography), giving an incredible 1.81 trillion photographs taken during the year. Photography has never been so popular. This figure continues to rise and it is estimated that, by 2030, some 2.3 trillion photographs will be taken during the year. When, as members of the Royal Photographic Society, we

think about who takes photographs and with what equipment, we should not forget that today almost 93% of all photographs are taken with a smartphone and only 7% with a conventional camera. Yes, read that sentence again and let it sink in ... almost 93% of the 1.81 trillion photographs taken in 2023 were taken with a smartphone and only 7% with a conventional camera!

When we consider the future direction and ambition of the RPS to promote the knowledge, understanding and appreciation of photography, I maintain that we should not be concentrating our efforts exclusively on those photographers who are committed to the use of 'leading brand' DSLR cameras, with a bag of expensive lenses, and a pocket full of memory cards. Rather we should acknowledge the direction in which photography has moved and look to users of smartphones; they take far more photographs than the rest of us put together! It is, arguably, the users of smartphones that today have by far the greatest engagement with the medium of photography and I am sure those of us who still use DSLR cameras probably also use a smartphone too!

In the 28 years since the formation of the RPS Digital Imaging Group, the art, the science and the craft of photography have evolved at a breathtaking pace. There is no doubt at all that, as the RPS moves forward, DIG will have an increasingly important role to play in maintaining our strategic direction and in helping us to fulfill our charitable commitment to the widest possible community of photographers ●

#### See Simon's work

To see Simon's work, visit his website at [simonhillphotos.com](http://simonhillphotos.com).



Dating from the late 1990s, the original ColorVision (now known as Datacolor) Monitor Spyder. Credit: DP Review

## COLOUR MANAGEMENT AND HOW IT HAS CHANGED IN THE LAST 30 YEARS

### DATACOLOR

With colour management built into almost all of today's image processing software applications, it is easy to forget that in the early days of digital photography, getting the image captured in camera into a print was not always easy, with colours often rather different in print to that captured. One of the early solutions involved calibrating monitors and printers to assure that colours remained 'the same'. Our friends at Datacolor have been market leaders in calibration since the beginnings of digital photography and review some of the changes over the last 30 years or so.

From advancements in cameras to improved editing software, photography has come a long way in the past 30 years. Another key part to the growth in the industry was the introduction and development of colour management tools and software.

Even in its infancy, colour management came as a massive revelation to photographers who now, for the first time, could see their artistic vision come to life the way intended. With technology in all sectors now moving at warp-speed, it begs the question of

where colour management is headed in the next three decades. In order to understand, we must first look at its humble beginnings.

#### The 1980s

The first use of the term 'colour management', arguably, could

be dated to the late 80s. In 1987, colour became widely available on personal computers for the first time, allowing photographers to seamlessly print images (Starkweather, 1996). However, they were quick to notice that the printed image did not reflect that on the screen. But that wasn't the only challenge that photographers of the late 80s faced in terms of colour management:

**Limited Digital Color Spaces:**

Computer monitors and printers had limited colour capabilities. Colour spaces, such as RGB and CMYK, were used, but they were not as well-defined or standardised as they are now.

**Lack of Standardisation:**

There was a lack of standardised colour profiles and calibration tools for different devices. Each manufacturer had its own colour representation, making it challenging to achieve consistent colour reproduction across hardware.

**Analog Printing Dominance:**

In the print industry, traditional analog printing methods like offset printing were prevalent. Achieving colour consistency in print required skilled technicians, and colour proofs were often created manually.

**The 1990s**

In the early 90s, however, colour management technology started to gain a bit more momentum. The International Colour Consortium (ICC) was established, setting the standard for colour management. This included the creation of colour profiles, providing a framework for consistent colour reproduction. Additionally in the 90s, Adobe introduced 'Adobe Colour Management System' (ACMS), which was also developed to address colour consistency issues in the digital workflow. Apple introduced the very first iteration of ColourSync with the release of Mac OS System 7.1. ColorSync 1.0 was designed to ensure consistent and

accurate colour reproduction across different devices, such as monitors, printers, and scanners.

In 1996, ISO 12647 was published, which is a series of standards developed by the International Organisation for Standardisation (ISO) that pertains to the printing industry, specifically focusing on graphic technology and colour management (Mellow Colour, 2024). ISO 12647 standards provided guidelines and specifications for achieving consistent and high-quality colour reproduction in the print production process. For the first time, photographers could consistently print and develop accurate images.

In the late 90s, one of the most notable monitor calibration tools was developed which was the Colorvision's (now known as Datacolor) Spyder. The original Spyder set the tone for calibration and colour management, making colour accuracy achievable for photo editing. The tool was groundbreaking, allowing photographers to get accuracy across their photos and prints. Finally, photographs looked how they intended.....or did they?

While it was a major breakthrough in colour management, the Spyder and other calibrators of the late 90s and early 00s offered only basic calibration features and often led to variations of colour accuracy. Of course, it's easy to critique the first tools when looking through a modern lens - the first mobile phone to the one you have today is incomparable - but it's still important to note how far colour management technology has come, and where it's headed.

**The 2000s**

After many different companies decided to create their version of the Spyder, there was more and more progression within colour management in the 00s. In the 2000s, monitor calibration tools like the Datacolor's Spyder2 and X-Rite's

ColorMunki refined the accuracy and ease of calibration, surpassing their predecessors. These tools offered more sophisticated colour profiling, improved hardware, and streamlined software interfaces. For photographers, this meant achieving greater precision in colour representation, vital for accurate photo editing. The advancements paved the way for a standardised colour workflow, ensuring consistency across devices. As technology evolved, photographers could confidently produce work with reliable colour accuracy, enhancing the quality of their output. These developments in the 2000s set the stage for continued innovation, empowering photographers with tools for uncompromised colour management in their creative processes. Following the success of the Spyder2, the Spyder3 was released later in the decade, allowing for improved colour accuracy and an enhanced software interface with reliable colour accuracy, enhancing the quality of their output.

Additionally, the introduction of wide-gamut displays in the 00s expanded photographers' colour spectrum, necessitating advancements in calibration tools like the Spyder series to ensure



Released in the early 2000s, the Spyder2 was the next iteration of a calibration system suitable for photographers. Credit: ePhotozine.

accuracy across the extended range. Concurrently, Adobe Lightroom's launch revolutionised post-processing, integrating advanced colour management within its toolkit. This streamlined photographers' workflows, allowing precise colour representation from capture to output. Together, these innovations empowered photographers to work with a broader and more vibrant colour palette, fostering creativity and enhancing the overall quality of their visual creations.

**The 2010s**

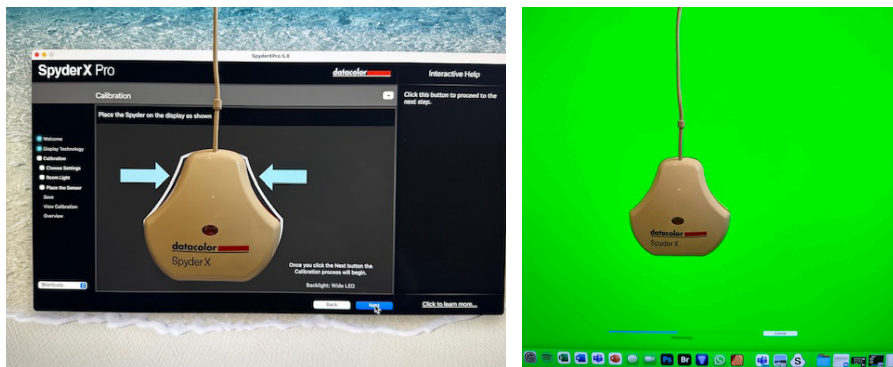
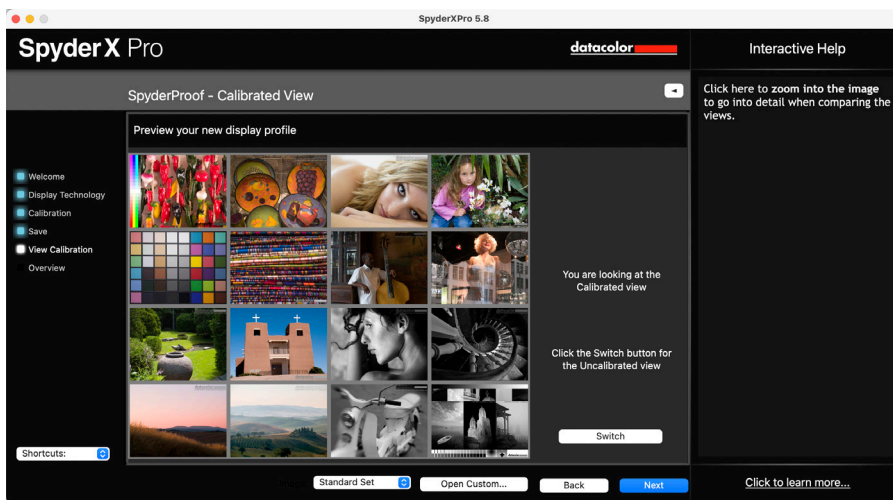
In the 2010s, colour management underwent significant advancements, introducing tools and technologies that revolutionised the way photographers approached and achieved accurate colour representation. One of the pivotal improvements was in monitor calibration devices.

Compared to the 2000s, these devices in the 2010s featured enhanced sensor technologies that provided more precise and reliable

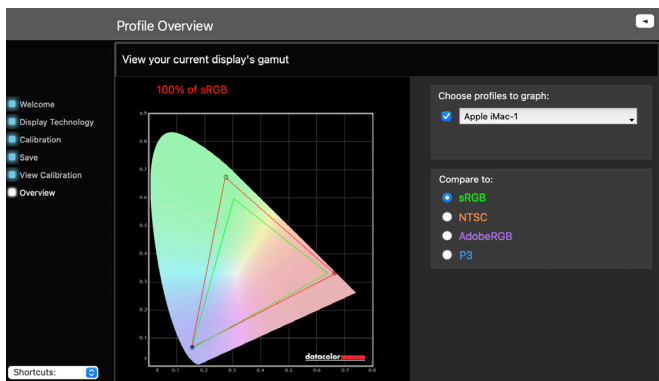
calibration. This improved the accuracy of colour representation on monitors, a critical aspect for photographers engaged in tasks like image editing and post-processing. Datacolor launched the Spyder4 and Spyder4PRO, which offered faster and more accurate calibration than previous models. There was also a more intuitive and user-friendly software interface, enhancing ease of use and efficiency in monitor calibration processes. This shift was particularly significant for professionals who needed to work efficiently while maintaining high standards of colour accuracy.

Datacolor then went on to launch the Spyder X in 2018, a completely new sensor system which was based on light-sensitive optics and a sensor in which inorganic filters were used. Compared to its predecessors, the optical system of the Spyder X led to an improvement in calibration speed by a factor of four. For the first time, a calibration could be performed in under 2 minutes. In addition, the sensitivity could be increased considerably.

The evolution of colour management in the 2010s empowered photographers to achieve greater consistency across various devices. This was crucial in a rapidly evolving digital landscape where photographers needed to ensure that their work appeared as intended not only on their calibrated monitors but also on different screens, ranging from laptops to tablets and smartphones.



Calibrating your monitor is quick and easy following on-screen instructions...



...and the software can offer a clear visual representation of the colours that you see on screen and the difference between calibrated and uncalibrated results



The latest version of the Spyder, the Datacolor Spyder X2

Additionally, these advancements allowed photographers to delve into a broader spectrum of colours and explore more creative possibilities. With increased confidence in the accuracy of colour representation, photographers could experiment with vibrant and nuanced colour schemes, enhancing the visual impact of their work.

In essence, the improvements in colour management during the 2010s meant that photographers could work with heightened precision, deliver more visually consistent results, and explore a wider range of creative expressions, ultimately contributing to the overall quality and impact of their photographic endeavours.

**The 2020s**

In the 2020s, colour management for photographers experienced notable enhancements building upon the progress made in the previous decade. Advanced monitor calibration tools introduced even more sophisticated sensors and software interfaces.

In 2022, Datacolor released its most innovative Spyder, the Spyder X2, based on the architecture of the Spyder X. The newest design offers increased accuracy and improved speed and is characterised by the fact that the Ultra version is also suitable for monitors with very high brightness, as are often used in videography. The most important

innovation, however, is the introduction of completely revised software.

Furthermore, the 2020s witnessed a surge in the use of High Dynamic Range (HDR) displays, providing photographers with an extended range of luminance levels and a more immersive viewing experience. This advancement prompted a shift in the calibration landscape, necessitating tools that could cater to the intricacies of HDR content creation.

Looking ahead, the future of colour management in photography is likely to involve even more seamless integration of AI, allowing for real-time adjustments and predictive colour correction. As technology continues to evolve, we may see developments in display technologies, perhaps incorporating new materials or methods that enhance colour accuracy even further. The democratisation of high-quality colour management tools and techniques is also anticipated, enabling a broader range of photographers to access professional-grade capabilities.

Over the next 40 years, the trajectory of colour management in photography will likely be shaped by rapid technological advancements. Innovations might include advancements in quantum dot displays, holographic imaging, or even breakthroughs in neuroaesthetics, allowing for a deeper understanding and

manipulation of how humans perceive and interact with colour. The integration of colour management with virtual and augmented reality experiences could redefine visual storytelling, offering immersive and highly accurate colour environments. While predicting specifics is challenging, the evolving landscape suggests a future where photographers will continue to push the boundaries of creative expression through increasingly sophisticated and accessible colour management tools ●

**Learn more**

- [datacolor.com/spyder](https://datacolor.com/spyder)
- [dpreview.com/reviews/colorvisionmonitorspyder](https://dpreview.com/reviews/colorvisionmonitorspyder)
- [ephotozine.com/article/spyder-2-express-4358](https://ephotozine.com/article/spyder-2-express-4358)
- [fstoppers.com/reviews/simply-undefeated-review-datacolor-spyder-x2-elite-639554](https://fstoppers.com/reviews/simply-undefeated-review-datacolor-spyder-x2-elite-639554)
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# A PHOTOGRAPH IS NOT AN IMAGE UNTIL IT'S BEEN PRINTED FOR THE WORLD TO SEE

**ROBIN WHETTON** PermaJet Managing Director

Those of us that print our images may not have given much thought to the papers and inks that we use. PermaJet, one of the brand-leaders explains how home printing became reliable and a little of what goes on to produce those packs of paper that we buy.

We started our business in 1983 designing and developing darkroom products, namely the Nova Slot Processor and Archival Print Washers. In those days, processing and printing at home was quite common so there was both an amateur and commercial element to the silver halide printing industry. There was also a huge number of rolls of film being processed for commercial photographers, so focus soon turned to the development of C41 chemistry. It was not long before we were producing specialist high speed chemicals for press photographers who needed to take materials on their travels. Portable film and print processing units were needed, enabling easy, quick makeshift darkrooms for press and news photographers who would then wire images across a telephone line to waiting newspapers - oh how the days have changed.

## The digital revolution

We found that our world was going to change when one day in 1991, Horst Faas (then picture editor of



Nova Darkroom Washers

The Associated Press) called me and said "Robin, you need to come to my office. I have something here that is going to destroy your business!". What I was shown in AP's Fleet Street office was one of the first commercially available Kodak digital SLR cameras. No need for a darkroom, and therefore no chemistry, film, or paper... and so the digital revolution began!

Faced with the information that I was gaining from Fleet Street photographers about the emergence of the digital era, we were able to look at the bigger picture of how this would affect the imaging world and those working in the darkroom industry. It may have taken a further five or six years before digital cameras transitioned down to the amateur enthusiast level. During those years and subsequently, darkroom products continued to be sold worldwide, and in some cases there has been a marked increase in the demand for such items. Many people expected art to decline radically when photography came into being; that was not the case. Because of this we felt that the darkroom business would not fade away either, but instead it would become an art form.

Numerous companies sought refuge and proclaimed that digital reproduction would never see the quality that the then silver halide processes were able to deliver. They felt more relaxed in that self-proclaimed position - a position I didn't share. My colleagues and I spent many hours looking at options for our business and how

we felt the darkroom market would change in the future but without coming to any defined conclusions. By the late 90s we were starting to see digital print output gaining in quality and speed. In professional fields, this meant the world of digital print output would start to gather pace, something that would only continue to become more accessible to all. We spent many hours looking at ink and paper combinations and the needs of the imagemakers. It became clear that the focus for the professional photographer was going to become the ability to deliver something special, so we pledged our time and energy into fine art inkjet media and specialist colour and monochrome inks.

By 1999, we had amassed enough knowledge in both computer science and paper technology to launch the PermaJet inkjet brand at the Focus trade show in Birmingham. Photographers from all walks of life were heading out to this exhibition thinking only of digital camera technologies, so knowing PermaJet was going to affect the way that they were thinking about print in the future was a joy to see. We were right at the pinnacle of the transition from darkroom to digital and people loved what they could do with the new digital technologies. At Photokina in Germany in 2000 it was clear that the early adopters were enthusiastic about everything digital. The thirst for knowledge was captivating, especially for the companies who were small enough and quick enough to make the



Inside a paper factory



Mould-made paper line

changes that were going to be needed to embrace the future. There were many challenges and hurdles to be overcome, not only to do with the speed of change but the cost of replacing both cameras and print equipment in that early period. Areas that photographers were not familiar with would change the way they would capture and reproduce their images.

One of the key elements for print output was the development of pigmented inks to ensure that the images that we captured would not fade or change colour on the paper. Many articles were written in the early days about fade resistance and archival permanence, and these were supported by new organisations that claimed prints had fade resistance far above what was capable with the then dye based inks and resin-coated media. However, in the background, there were several small companies working on pigmented inks and Fine Art papers which were both lignin and acid-free. The combination of pigment inks and acid-free materials became the driving force of being able to create stable images with a high degree of archival permanence.

**How fine art papers are made**

Fine art papers are made generally from 100% cotton or a mixture of cotton and untreated alpha cellulose. The most archival are

materials made in as natural state as possible without any optical brightening agents. The combination of several factors is what gives us the greatest degree of fade resistance and achievability.

Art papers are made on either a mould-made or Fourdrinier machine. Mould-made papers have essentially no direction or grain. They tear equally in all directions, tend to stay flatter, and have a unique soft feel. This material is sought by painters, watercolourists and sketching artists. Current commercial mould-made papers are made on a continuous roll process to enable volume production. A large drum is dipped into a vat of paper pulp that is constantly stirred and replenished to maintain a consistency. The drum picks up a skin of pulp and this in turn is transferred to a felt (the felt side of a paper is the side in contact with the pulp). It is then drained and dried which gives a distinctive but subtle art surface. Every machine has its own signature or raw surface. It can be cold calendared to make it smoother but retain some 'tooth' or hot calendared to be made very smooth (squeezed between either cold or hot rollers). It can be squeezed between felts to make one or both sides pick up an impression from the felt to give the range of textured surfaces that we all know and love today. This type of paper/material is ideal for deckle edging and is replicated with some

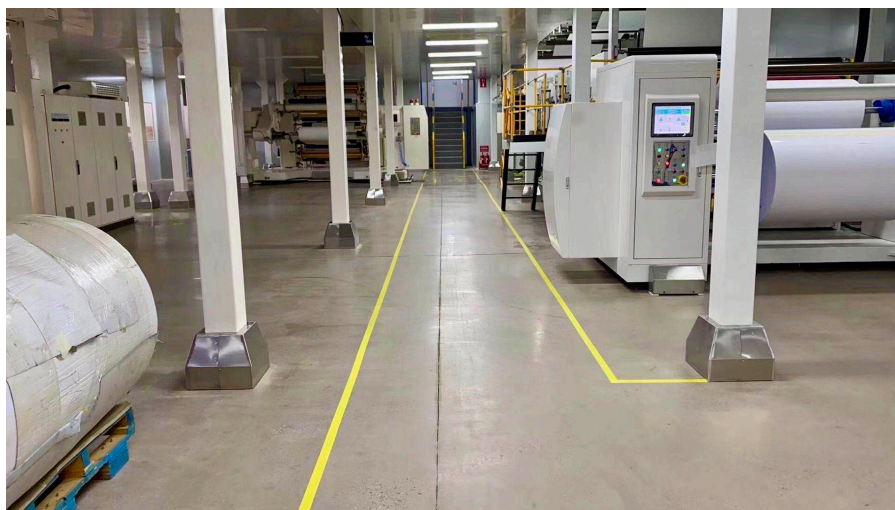
of the digital fine art papers sold in the market today for use on an inkjet printer.

Fourdrinier paper machines adopt essentially the same process other than at the front end the paper pulp is squirted out of multiple nozzles onto a carrier band. This gives the paper directionality, e.g. it tears more easily down the grain (parallel to the web). It is a much faster process and does not reproduce the random effect or level of texture the mould machines do, so only fine art specialist mills still produce mould-made papers.

**The introduction of colour management**

In time, the new printers brought an increase in the number of inks being used, which would now generate high-quality prints with much higher colour gamut levels and far greater resolution capabilities. The quality of image output became far superior to what we experienced in the early days and at a much more affordable cost. For both the professional and amateur enthusiast, the next hurdle became the ability to reproduce colours in an easy and more accurate format.

In 1993 the International Colour Consortium (ICC) was formed by eight vendors. Their quest was to encourage standardisation of an open vendor-neutral cross platform colour management system. This organisation and the use of ICC



Paper coating machine

profiling would become a key element in enabling everybody to see colours in the same way no matter where they were in the world, giving an ability for each individual device to reproduce colours to a set standard. This was a revolution inside a revolution taking place. In principle, this meant that if you were to use a calibrated monitor, the colours that you would see on your monitor could be seen and correctly reproduced on any inkjet printer that was using an ICC profile made for the chosen ink and media.

The next challenge for the industry was who was going to create the profiles, distribute them, and how we should educate the market. In the early days the true knowledge was sparse, and people created their own view on what needed to be done which meant many inaccuracies were taught. Within a couple of years, it became very clear that the printer manufacturers and the paper developers needed to educate the market, and so we began undertaking talks and lectures at both clubs and schools on how to best harness all this new technology. This generated what we now know today to be a widely adopted process commonly referred to as workflow. Workflow is the ability to do something that works on a repeatable basis, something that those of you working in a darkroom

learned many years ago. Look for consistency, change only one thing at a time, and make lots of notes.

### The future of the industry

This year The Imaging Warehouse, PermaJet's parent company, celebrated 40 years of being in the print industry, serving mainly amateur enthusiasts, professional photographers, print labs and art reproducers with both darkroom products and specialist inkjet media. There have been some very challenging periods and an awful lot of learning and re-learning to be done. It has certainly been an exciting period to have worked through and I'm proud to say that we are one of several companies who have weathered such major changes. Some of these companies not only supply high-quality products but also training and technical support to ensure that you, our customers, whether large or small, are able to get the best from the products that have been developed.

This industry will go on to change further I'm sure, as technology and desire for speed, accuracy, and quality continues. Most of it will be driven by the computer-based science, not by what we know from the past as being traditional silver halide technologies. That aside, the imaging industry has also grown and developed with mobile phones, ensuring that the future of image

making is secured by the young through the use and development of technology.

My last fading thought is that we should never lose sight of the art form silver halide and printmaking in the darkroom. It gives a welcome break from sitting and staring at a computer screen, which seems to dominate every aspect of our lives today.

Enjoy taking your photographs and making your images, but a wise person knows a photo is not an image until it's been printed for the world to see ●

#### Learn more

[permajet.com](http://permajet.com)

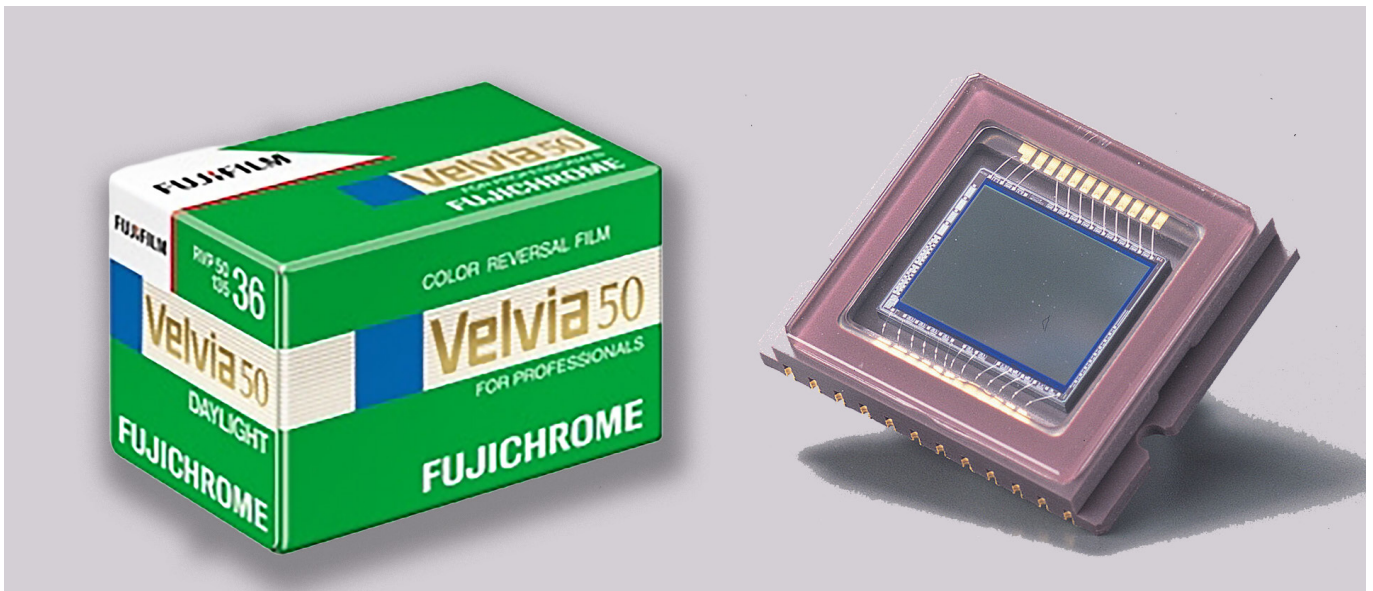
#### Member offer

To celebrate the 100th edition of DIGIT PermaJet are offering DIG members 15% off all PermaJet products.

Just place an order through the PermaJet website before 30 June 2024 and quote code PJDIGIT15.







Fujifilm has successfully made the transition from analogue to digital photography brand-leader - from the legendary Velvia to the Super CCD sensor

## SURVIVING THE PARADIGM CHANGE

### FUJIFILM

The changes to the photographic industry resulting from the move from analogue to digital imaging have been colossal and rapid. During this big shake-up some big names in the business disappeared. One name, Fujifilm, however remains at the forefront of the imaging industry. We were fortunate to get an opportunity to ask Fujifilm how they managed to navigate these turbulent times.

**Q: Commercial domestic cameras became popular and affordable in the 1990s. Did Fujifilm see them as a fad or was it obvious that the days of mass film use were coming to an end?**

Fujifilm foresaw the digital revolution at a very early stage. It wasn't simply a matter of digital photography and the innovation that would come from, for example, digital cameras, but a paradigm shift in many of the company's other businesses like print and medical diagnostics. As soon as the first DSCs became available, it was easy to see the impact on film usage and on film sales, film processing and film printing. This is precisely why Fujifilm entered its 'Second Foundation' and developed new business fields to extract so much of the technology and ability that had been developed within more analogue businesses.

**Q: Did everyone involved in Fujifilm see things in the same way? Why did people have their views?**

Fujifilm's global senior management team, led at the time by Shigetaka Komori, fostered a common goal amongst all employees worldwide. This meant that at all levels of the organisation was aware of the changes needed to continue to be a successful enterprise. It was a really good example of global leadership in the face of such a fundamental shift of the total business.

**Q: Did Fujifilm foresee the growth of photography that the inclusion of cameras in phones would bring?**

Yes, we did. From the very beginning, Fujifilm provided high quality lens optical products and lens assembly modules for camera phones. We knew from the very

beginning that camera phones would play a huge part in the development of consumer imaging. We were able to innovate transfer systems and apps to utilise images from phones in printing kiosks and other devices like INSTAX Link Printers.

**Q: Did the change in business from analogue to digital render a lot of knowledge and experience redundant 'overnight', or were more of the skills transferrable that might be apparent?**

During the analysis of business strategies developed by Komori and the global leadership team, the company analysed the strengths of the whole company in all its activities. Most interesting was the very high degree of 'chemical' knowledge built year after year in the development of analogue imaging. Specifically, one of these



The first 'fully digital camera', the FUJIFLEX DS-1P. Revealed at the 1988 Photokina show in Germany, it was 'the world's first camera to save data to a semiconductor memory card'. It captured images using a 400 kilopixel CCD.

focuses of knowhow was the understanding of how gelatine behaves. Gelatine is the 'carrier' layer for photographic chemistry and the company's scientists were able to apply this world class knowledge in a variety of biopharmaceutical applications. Gelatine is, after all, a complex protein not dissimilar to human protein.

In our core business of imaging - across photo, graphics and medical - we were able to apply deep understanding of image quality from optics, through sensors to output in the same way as we always did with analogue imaging.

**Q: Was there a time when Fujifilm thought that the latest development was all that consumers would ever need? And was continued development driven by consumer demand or the need to keep up with the competition?**

We never stop!

Consumer needs and business

applications constantly evolve and Fujifilm has to constantly innovate. This means not just the development of new consumer products (like INSTAX instant and hybrid cameras and printers) but also new devices needed by industry and healthcare that can solve complex needs and deliver new solutions.

**Q: Is there a particular reason that Fujifilm does not offer a wide range of domestic photo printers?**

We looked very hard at the market for consumer printers like inkjet products. There are many companies established in this field, especially those who have a good market share in the sales of hardware. Our approach has been different. Using our unique ability to understand molecular science and imaging in general, we decided that we were better placed to be a supplier of high-quality materials to this industry - such as the manufacture of inks and various ink technology. The exception to

this is the instant printer Link range. If we have a unique technology, then it's possible for us to use this uniqueness to make products which cannot be copied by competitors. That's the reason why we are making Link printers available as consumer products.

**Q: Were there any novel ideas that Fujifilm developed but did not market because you didn't think that consumers were ready for it?**

As you can imagine, we have and continue to have multiple development ideas. The company has a very strict 'gate' process where innovation is measured and judged at many different stages. This ensures that ideas that cannot be commercially realised don't make it to the factory floor. This may be because the market is not ready, or the technology needs further development; because these two variables may change in the future, we don't disclose any details of innovations that are at pre-marketing phases.



The latest Fujifilm camera, the X100VI, released in February 2024 and featuring a 40 megapixel sensor, 20 film simulation modes and in-body image stabilisation offering up to an additional 6 stops of hand-holding

**Q: Was there one thing that Fujifilm think was 'the thing' that made the public move to digital imaging?**

The popularisation of the personal computer and the ease of printing from digital media were two huge drivers making digital imaging popular amongst consumers.

**Q: What differences are there between your customers in 1990 and today?**

We try to think very hard about differences in consumer attitudes and behaviours and follow the distinct differences in each generation. Not just because of the way that different generations use imaging (think about teenagers decorating bedrooms with INSTAX prints vs young parents who document the lives of the family in photobooks), but also in the ways we communicate. Our brands have personalities that need to express themselves individually according to their audience. For B2B (business-

to-business) customers, there are many changes, but probably the biggest change is in the structure and governance of customer companies where 'professional' systems have become the norm. Compliance is a frequently used expression!

**Q: Fujifilm moved quickly into offering mirrorless cameras - what convinced you that was the way to go when some hefty brand leaders obviously didn't?**

At Photokina in September 2010, we showcased a new digital camera concept, the FinePix X100. This was a step change in our direction as it was a premium compact camera using an APS-C sized sensor. Up until then, we only had much more consumer focused models. It was the reaction to this retro styled, flagship camera that made us stand out and think that we needed to enter the mirrorless market which we did about 18 months later with the X-Pro1.

**Q: How many years in advance of taking your first Fujifilm digital camera to market did you start the development?**

On average, it takes 18-24 months to develop a new digital camera model from concept to being on sale ●

**Learn more**

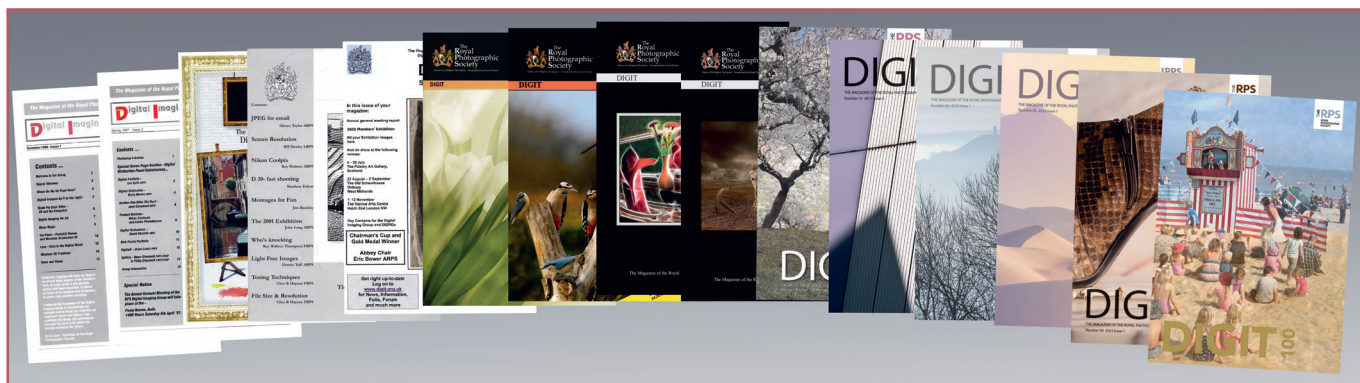
[fujifilm.com/uk/en](https://www.fujifilm.com/uk/en)

A site dedicated to the X-Series digital camera site at [fujifilm-x.com/en-gb/products/x-series/](https://www.fujifilm-x.com/en-gb/products/x-series/)

**An offer from Fujifilm**

Fujifilm have kindly offered RPS members a 10% discount on the FUJIFILM X-H2S, X-H2 and X-T5 cameras (all variants). Orders must be placed on the Fujifilm X/GFX eShop at <https://eshop.fujifilm-x.com/uk>. The discount can be applied to any existing offers showing on this website. This offer is valid until 23 May 2024. Subject to availability of products.

Members need to send an image of their RPS membership card showing membership no. and expiry date to [fujifilmpr\\_uk@fujifilm.com](mailto:fujifilmpr_uk@fujifilm.com). A unique discount code will be emailed to the member, to be redeemed at the site above.



# 100 AND COUNTING

## JANET HAINES ARPS

The 100th issue of DIGIT magazine has given us an opportunity to look back at how digital imaging has evolved over the last 28 years. But the Digital Imaging Group and its members have also evolved and 100 issues of the group magazine provide a great insight into what has been of interest to members and the work that they produced.

When we started planning this issue of DIGIT we really wanted to do a 'look back' at all the DIGITs ever produced, to find the little nuggets of interesting facts and images. Little did I know how absorbed I'd get going through every one of the 99 copies we have online in our archive - now 100 with the production of this issue. Happy hours were spent, but such were my findings that it resulted in far too much copy to put it all in this 100th issue.

### DIGIT - the quality quarterly magazine from RPS Digital Imaging

Click on a numbered button below to view that issue of the magazine

DIGIT 01	DIGIT 02	DIGIT 03	DIGIT 04	DIGIT 05	DIGIT 06
DIGIT 07	DIGIT 08	DIGIT 09	DIGIT 10	DIGIT 11	DIGIT 12
DIGIT 13	DIGIT 14	DIGIT 15	DIGIT 16	DIGIT 17	DIGIT 18
DIGIT 19	DIGIT 20	DIGIT 21	DIGIT 22	DIGIT 23	DIGIT 24
DIGIT 25	DIGIT 26	DIGIT 27	DIGIT 28	DIGIT 29	DIGIT 30
DIGIT 31	DIGIT 32	DIGIT 33	DIGIT 34	DIGIT 35	DIGIT 36
DIGIT 37	DIGIT 38	DIGIT 39	DIGIT 40	DIGIT 41	DIGIT 42
DIGIT 43	DIGIT 44	DIGIT 45	DIGIT 46	DIGIT 47	DIGIT 48
DIGIT 49	DIGIT 50	DIGIT 51	DIGIT 52	DIGIT 53	DIGIT 54
DIGIT 55	DIGIT 56	DIGIT 57	DIGIT 58	DIGIT 59	DIGIT 60
DIGIT 61	DIGIT 62	DIGIT 63	DIGIT 64	DIGIT 65	DIGIT 66
DIGIT 67	DIGIT 68	DIGIT 69	DIGIT 70	DIGIT 71	DIGIT 72
DIGIT 73	DIGIT 74	DIGIT 75	DIGIT 76	DIGIT 77	DIGIT 78
DIGIT 79	DIGIT 80	DIGIT 81	DIGIT 82	DIGIT 83	DIGIT 84
DIGIT 85	DIGIT 86	DIGIT 87	DIGIT 88	DIGIT 89	DIGIT 90
DIGIT 91	DIGIT 92	DIGIT 93	DIGIT 94	DIGIT 95	DIGIT 96
DIGIT 97	DIGIT 98	DIGIT 99			



Everyone can now access each and every issue of DIGIT online

### Basic Equipment List

I promised a number of people during the excellent Photo Forum weekend at the Octagon (Thank's Bob!) that I would give a list of reasonable requirements for an efficient PC suitable for digital imaging. It looks something like this ...

- 75MHz Pentium on a PCI Motherboard.**
- 16MB RAM (EDO is faster)**
- 1GB EIDE Hard Drive**
- 4x CD-ROM**
- 2MB Accelerated PCI Graphics Card**
- 15 inch NI Monitor**
- MS Windows 95**
- Image Editing Programme**

A recommended computer specification for digital imaging in 1996

Conclusion - do a short precis here and then produce an online supplement telling the entire story.

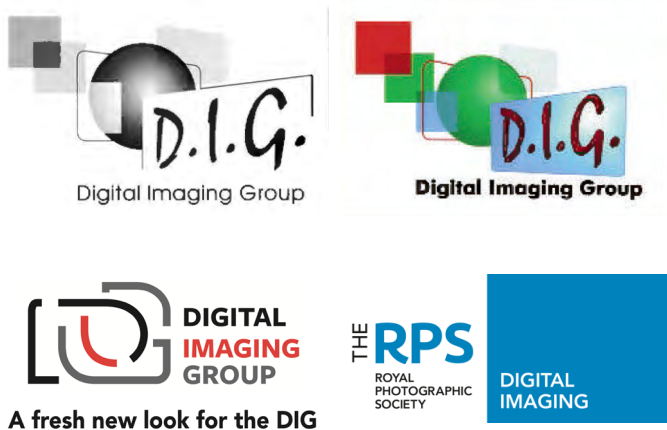
For many years now we have had not only the full physical library of DIGITs, in safe keeping with our Editor, but also the online archive which can be found on [www.rps.org/di/digit-archive](http://www.rps.org/di/digit-archive) along with the supplement. Previously this archive has been kept hidden for the use of DI members only. But upon the publication of DIGIT 100 we are pleased to announce that this amazing record of the RPS Digital Imaging group, and the development of digital photography, is now to be made public.

What has made my discovery so interesting, whilst going through all 99 back copies, is to see the progress of the DI group, the publication itself and the record it represents of how digital photography has progressed since 1996. Looking back to DIGIT 1 and seeing the recommended specification of 'an efficient computer' we needed for digital imaging, made me smile broadly .

DIGIT issues 1 to 6 (May 1998) were all printed in black and white with comments telling us that members were scanning slides and in some cases the 'manipulation' they were using. By 1998 we see images using Motion Blur, Cloning, Unsharp Mask, even the occasional use of multi layers. By DIGIT 7 in October 1998 we see the first colour supplement with the then editor really going to town with all the bells and whistles.

On the earlier copies of DIGIT the original D.I.G. logo in B&W appears, but by issue 22 it shows up for the first time on the front cover and in colour. Fast forward to 2017 and issue 72 and DIG had an updated logo, designed especially for us by a then US member Jason Witworth.

Today we use the RPS branding and official versions.



*Evolution of the Group logo*



*Colour supplement which accompanied issue 7*

In 2015 DI member Alan Cross LRPS did the mammoth task of digitising all the back copies of DIGIT and starting the archive that we maintain to this day.

## IT STARTED WITH A WISH... BUILDING THE DIGIT ARCHIVE

### ALAN CROSS LRPS

Now in its 65th issue, the DI Group magazine saw its first magazine back in 1996. Now we have a digital archive which members can explore and be reminded of where we came from digitally, and how we have progressed over the years.



Since 1996 we have had a series of DIGIT Editors to thank for producing such a great record of the Digital Imaging Group, charting the advancement and changes in digital photography and the work of our members.

Editor	Issues	Editor	Issues
Barrie Thomas	1 - 2	Carol Lewis	60 - 64
Bill Henley	3 - 20	Jim Buckley	65
Glynis Taylor	21 - 22	Margaret Preston	66 - 70
Geoffrey Carver	23 - 24	Gary Beaton	71 - 90
Jim Buckley	25 - 44	Steve Varman	91 - 92
David Cooke	45 - 59	Gary Beaton	93 - 100

My journey though the DIGIT archives has been one of memories, smiles, discovery and amazement. 'Amazement' at how far we have come from those early days when the majority of Society members looked upon the early digital adopters with about the same degree of scorn as some are now doing with AI generated images. Now digital photography, whether using a camera or smartphone, is pretty much the norm and DI Group, with 1750 +/- members is the largest Special Interest Group representing 18% of the overall RPS membership.

From those early pioneers in 1996 the DI group has continually evolved, experimented and embraced change - and we certainly intend to keep it that way for the next 100 DIGITs.

I applaud all those who have contributed to DIGIT and the DI group over the years and I highly recommend you dip into the back archive for a thoroughly good read. [rps.org/di/digit-archive](https://rps.org/di/digit-archive) ●

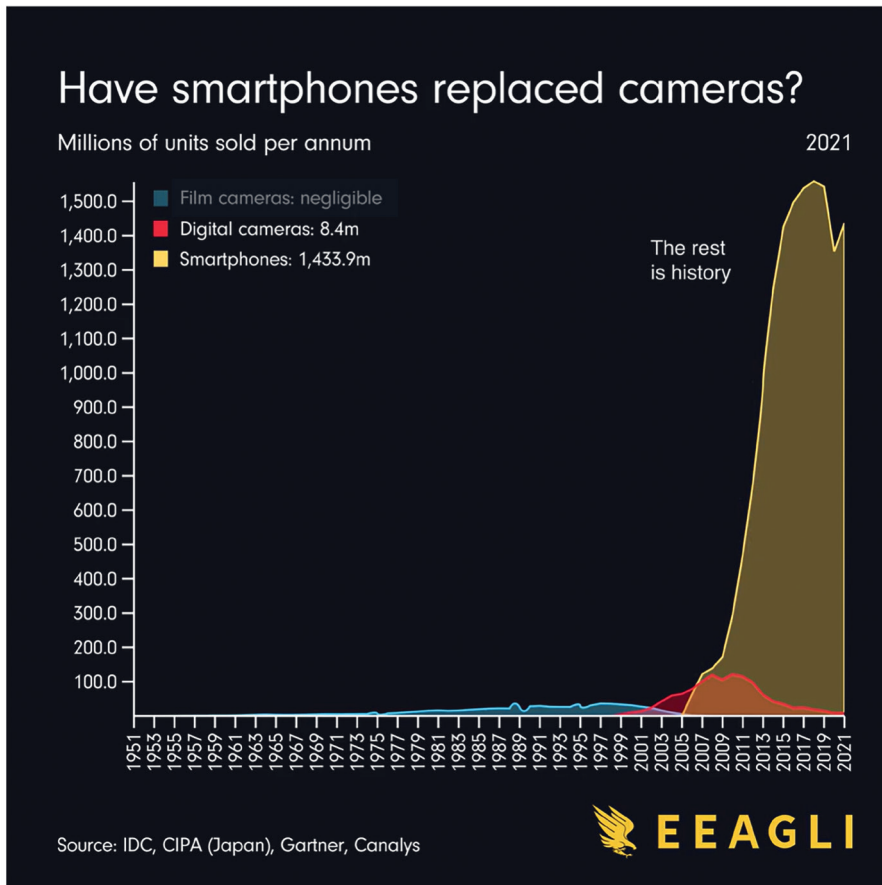
## A FINAL THOUGHT

Reading this issue of DIGIT may have got you thinking about how much has changed over the years, and how quickly it has all happened. As we think back in time, it's easy to forget when some of the huge changes occurred and, consequently, how quickly we adapt to the novel and find creative ways to utilise the additional features available to us.

Although we, as keen photographers, will probably have our own specialised camera equipment, the most common type of camera today, by far, is a smartphone. As we all know, a picture paints a thousand words, and an animated graphic can illustrate this change far better than this picture!

Take a look at [visualcapitalist.com/cp/charting-the-smartphone-effect-camera-market/](https://visualcapitalist.com/cp/charting-the-smartphone-effect-camera-market/) to see how many cameras there are today.

Perhaps the important question, though, is how many of the cameras around us are actually used? ●



### Charting the Smartphone Effect on the Camera Market

## IN PREVIOUS ISSUES

All previous issues are available from the DIGIT Archive at  
[rps.org/di/digit-archive/](https://rps.org/di/digit-archive/)



### DIGIT 97 2023 Issue 2



- 2 Group events
- 3 Contents
- 4 From the chair  
Janet Haines
- 4 Editorial  
Gary Beaton
- 5 Taking to bird photography  
like a duck to water  
Maggie Bullock ARPS
- 13 You can tweak images in an  
app?  
Nicki Gwynn-Jones FRPS
- 18 A Photographic Adventure in  
Rocky Creek Canyon  
Brian Menzies and Albert  
Hakvoort
- 25 We each see the world  
differently  
Alison Webber FRPS
- 29 Talk-Walk-Talk  
Richard Ellis ARPS
- 31 DIGIT Challenge: Woodland  
Impressions  
Jen Spiers
- 33 DIGIT Challenge: The  
Shipwreck  
Ken Hurst-Earl
- 35 In previous issues

### DIGIT 98 2023 Issue 3



- 2 Group events
- 3 Contacts
- 4 From the chair  
Janet Haines
- 4 Editorial  
Gary Beaton
- 5 Underwater photography  
David Keep FRPS
- 10 Abstract photography - a  
personal view  
Lois Wakeman LRPS
- 16 How To Make Cyanotypes  
Alan O'Brien ARPS
- 20 Astro-landscape photography  
Dave Lynch
- 25 Travel photography close to  
home  
Kath Phillips ARPS
- 29 Project: The Huskar pit  
tragedy 1838  
Wendy North
- 32 DIGIT Challenge: 2/10,000th  
of a league under the sea  
Evelyne Peten
- 33 DIGIT Challenge: A Tower  
Reading  
Neil Wittman ARPS
- 35 In previous issues

### DIGIT 99 2023 Issue 4



- 2 Group events
- 3 Contacts
- 4 From the chair  
Janet Haines
- 4 Editorial  
Gary Beaton
- 5 The art of convergence  
Mark Reeves FRPS
- 9 Dan Jones: CEO and  
photographer  
Dan Jones
- 14 What comes first the book or  
the project?  
Wendy North
- 17 Behind the scenes at  
the Second Edinburgh  
International Salon  
Joe Houghton and David  
Greer
- 22 The RHS Botanical Art and  
Photography Show
- 26 Digital Imaging workshops  
Melanie Chalk ARPS
- 29 DIGIT Challenge: The banana  
leaf project  
Ashok Viswanathan
- 31 DIGIT Challenge: My holiday  
experiment  
John Moore
- 33 DIGIT Challenge: Nightmares  
and visions  
Janet Lee
- 35 In previous issues

### The cover image - Punch and Judy by Hilary Roberts FRPS

Hilary says 'The picture was taken at Weymouth when we were on holiday with the grandchildren. I think it was in 2009. It became part of a little series of nostalgic images which featured the grandchildren, then very small and now at University! It would have been a Sony digital camera, but I don't remember which. All the pictures were massively fiddled with - including, as I recall with a very light overlay of marble, taken from the floor of a hotel where we once stayed in Pistoia, Italy.'

