



## What Camera to Use to Photograph Paintings, Maps, Drawings, Posters So you can print this art as Giclee



Part I: Zoom-Lens Compact Camera  
and 35mm DSLR Cameras  
(Canon, Nikon, Leica, etc)



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## Contents

Options for Photographing Paintings to reproduce as Giclee Prints	3
Entry Level: 4, 5, 6, 8, 10, and 12 Megapixels	5
Why do we not list Olympus or Pentax?	8
35mm DSLR Cameras for giclee	10
Why not Olympus or Pentax?	14
General comments	14
Why don't we mention Leica more?	14
Aligning your CCD parallel to your painting	16
How to overcome Deficiencies of 35mm Cameras	17
Summary	18
Conclusions	19
The Photo Equipment Segment of the FLAAR Reports Series on Giclee	19
For further information	20
Footnote to History	21
Bibliography	22

## Options for Photographing Paintings to reproduce as Giclee Prints

There are many ways to get your painting or other flat work of art ready for a giclee printer.

1. you can photograph the painting with a traditional camera with film (Nikon, Leica, Hasselblad, or large format) and then scan the resulting transparency.
2. You can put the poster, map, drawing, painting, or other art directly onto a flatbed scanner.
3. You can feed the artwork through a wide-format scanner.
4. (Especially if the art is too large for a normal scanner) you can photograph the painting (or map, poster, drawing or other art) directly with a digital camera.

This FLAAR Report covers option 4: digital photography.

We have several reports that cover option 1. Option 2 is self-explanatory: you put the object on the scanner and press the “SCAN” button. But most art is too large for the average scanner, so option 1 or 3 or 4 are the most likely. There are, however, custom-made large format scanners. These are both sheet-fed (HP, Contex) or flatbed scanners (Screen and one or two other brands; we are speaking here of flatbeds considerably larger than the tabloid size of a Creo). There is an entire separate FLAAR Report on all each of the scanner options.



*Macro Nikon D100*

You could consider the Cruse as a giant flatbed scanner in reverse (it scans from above, not from below, so you get much better results because you can modify the placement of the lighting and hence control the shadows to some degree).

For option 4 there are four sizes of digital cameras you can use to photograph your art.

- Compact camera, non-interchangeable lens
- 35mm digital SLR camera
- medium format camera
  - o One-shot (Bayer pattern)
  - o Multi-shot (four shot)
- Large-format tri-linear scanner (multi-shot only).

There is a separate FLAAR Report on all medium format options. There is a separate FLAAR Report on large-format tri-linear scanners. Now, in the present report, we will discuss the first two categories.

“What Entry-Level Camera to Use to photograph paintings, Maps, Drawings, Posters so you can Print this Art as Glicee/Part I: Zoom Lens and 35mm SLR Cameras”.

The present FLAAR Report is based on our experience using digital cameras from circa 1996 onward. Today FLAAR is one of the few institutes in the world with an 80 megapixel Cruse, 48 Megapixel Better Light, as well as medium format Phase One, Canon EOS-1Ds Mark III, Nikon D-series (various), and even point-and-shoot digital cameras.



Photokina Cruse Booth 2008



Cruse Booth 2008

## Entry Level: 4, 5, 6, 8, 10, and 12 Megapixels

You can take a good photograph with any adequate digital camera of 4 megapixels or over. Yes, you heard correctly, 4 megapixels is fine for a small painting that you will reproduce at natural size. The first digital camera I used was 2 megapixels and cost \$28,000. Several months later the next generation came out: wow, 4 megapixels. It also cost \$28,000! Fortunately I was a consultant in Japan and the museum bought all the equipment. But these Kodak-branded Nikon-made cameras were great (for their day).

Today as we enter 2011 I prefer an 80 megapixel Cruse or at least a 48 megapixel Better Light. My medium format is a mere 22 megapixels but with Zeiss lenses can beat any Canon 21 megapixel system. But if you already have a more economical camera, and if you wish to produce décor for your friends and family, no need to buy a \$40,000 (Hasselblad or Better Light) to \$110,000 system (Cruse).

For point-and-shoot, we recommend no less than 4 megapixels. Of course today you can get point-and-shoot at 8, 10, and 12 megapixels from most brands.



*Hoodman Ljubljana 2009*



*Canon EOS Rebel T2i 2010*

The downside is the lack of interchangeable lenses. Zoom lenses are not tack sharp. But otherwise, brands such as Sony, Canon, Nikon, and Leica/Panasonic point-and-shoot cameras are all acceptable for entry level if you don't need pinpoint sharpness. But only for page-sized art work that will be produced at page-size prints.

The 8 megapixel Sony F828 had a good pixel count but still has the disadvantages of being a point-and-shoot zoom-lens camera. The Sony F828 did poorly in our tests over several months and has fared well primarily in commercial reviews with paid sponsorship. In the FLAAR course on digital photography we explain the downsides of zoom-lens cameras. But other models are fine. Just realize that most of the web sites claiming to do "reviews" of point-and-shoot cameras are what we call sham-reviews or pseudo-reviews. Some of this could be considered simply skills for camera stores.

Eight megapixels is eight million photo sites. That is too many for the small sensor area; the individual sites are rather small. The results include purple fringing and about every other digital defect that you can imagine.



The other downside of point-and-shoot cameras is not their quality (which is okay for small size enlargements), but the distortion of the perspective caused by their zoom lenses. If you photograph a small painting, you will likely get distortion of the edges of the painting. This is less likely with a 35mm DSLR and even less likely with medium format or large format digital backs.

A further disadvantage of most point-and-shoot digital cameras is that they are made for snapshots of family vacations, not for recording of precise colors of a work of art. The camera's software often exaggerates colors, distorts the color gamut, and over-saturates reds.

Because the average audience for these cameras are people using them for holidays, weekends, family, and hobby, everything is automatic, including sharpening. The result is that many features are overdone: the image is sharpened so excessively that the image looks cheap and poorly done when you compare it with a professional photograph with a good camera.

The most obvious disadvantage of attempting to use a point and shoot camera to record a drawing or painting, to reproduce as a giclee print, is sheer lack of file size: you can't enlarge the prints much past 11x17 or A3 size, and when you do, all the imperfections (listed previously) become all the more obvious.



CanonEos5D 2010

We get asked every day by people who have just paid \$899 to \$1200 if their camera can start producing giclee printers. Let us close by reminding you of digital reality.

#### Point-and-shoot cameras

- Have fuzzy electronic viewers;
  - You can't see the true colors or the true focusing plane.
  - The image may shimmer and be exaggerated in the LCD viewer.
- Zoom lenses distort, especially at the edges.
- Colors may not be true.
- You may be stuck with sRGB, a limited color gamut for desktop printers and the Internet
- You can't enlarge the prints, or if you do, the results will be marginal to poor.

Yet I am sure that a dedicated individual, with eternal patience, and a really excellent point-and-shoot camera (some of the Nikon and Canon models, at least one of the Fuji models, or the Sony) can achieve a decor print, even up to 24", that would impress most viewers.

The first digital camera I ever used was less than 4 megapixels. I learned year by year, and megapixel by megapixel. So if you are starting, use our warning (about compact cameras) simply as an incentive to do a careful job with your first digital camera. Practice, experiment, and soon you can move up to a better camera, a larger printer, and achieve giclee prints that look great.

### Why do we not list Olympus or Pentax?

These are perfectly good brands for weekend photography, travel photography, photographing your family and friends. But nowadays, most professional photographers use Canon or Nikon. Sony took over the remnants of Minolta and Sony cameras today are better than the original Minolta; but Sony has no professional brand name status (nothing wrong with Sony cameras, just that pros tend to prefer Canon or Nikon).

Olympus and Pentax are not better or worse than others in compact size (point and shoot), but for 35mm DSLR their sensor size is of inadequate size. So we don't take these brands seriously, at any size. There are simply too many other good cameras; we do not have time to worry about Olympus or Pentax.

Notice that this particular report is about cameras to digitize paintings, old maps, historical posters, or other art that you wish to reproduce as giclee or décor. If you want to do fine art photography, that is an entirely different question. For fine art photography an Olympus or Pentax are as good



*Nicholas Hellmuth holding a Canon EOS1Ds Mark II  
Photokina 2004*

as most entry-level Nikon or Canon cameras, if you don't need to enlarge your photos past A3 size or 11x17" size, or if you want to enlarge up to 24" but are not too fussy about details. A complex scene with lots of colors may be so beautiful that not many people will notice that it was taken with a point-and-shoot camera.



I have been to a photo exhibit, in a gallery, of images taken with a 2-megapixel point-and-shoot camera. I enjoyed the photographs, but you got precisely what you put into it: 2-megapixels worth.

If you are serious about fine art photography, or about digitizing art work for décor, you will not attempt to do any of this with a point-and-shoot camera. You will save up and get a good 35mm DSLR camera instead.



*Nicholas Hellmuth shooting with a Hasselblad*

### 35mm DSLR Cameras for giclee

SLR does not just mean only single lens reflex; SLR means interchangeable lenses and a true optical viewfinder.

There are several kinds of digital SLR camera nowadays:

- General purpose digital cameras:
  - o Nikon D70, D90 at entry level
  - o Nikon D300s and D700 at mid-level
  - o More expensive Nikons at their high-end, 3Dx, 3Ds, etc
  - o Canon Digital Rebel, at good entry level
  - o Canon EOS 5D... 7D... various models (old plain 5D not good but others good)
- Intermediate cameras: general purpose but with lower-res setting for action (Nikon D2X)
- Cameras dedicated to shooting action and sports
- Full-frame digital cameras:
  - o Kodak SLR/c, (long before Canon, Kodak was the first full-frame; we still have it)
  - o Kodak SLR/n,
  - o Canon EOS-1Ds Mark III



*Nikon D300/Lens 24-85mm 2010*

You do not need a sports or action camera for shooting oil paintings. Your oil painting is not going to run out of the studio in between shots.

For 35mm DSLR at mid-range your choice is the Nikon D70 through D700, Canon EOS of many sizes and shapes.

The Kodak 14n was distinctly unsuccessful except if you shoot with very bright lights (which may either melt your original painting or cause unacceptable highlight reflections on the ups and downs of the brushstrokes of oil paint). Because of the terrible PR from the unfortunate models those two years, Kodak is totally out of the market for years now. But the Kodak SLR/n and /c are okay if you get one on eBay for peanuts. I have used both the Kodak SLR/c and then I tested the Kodak SLR/n. These are okay when color preciseness is not an issue (this is a polite way of saying that the Kodak pumps up the color saturation to make the resulting photo look "pretty.")

Foveon makes the sensors for the Sigma digital cameras. Foveon made more PR than any other camera sensor in the history of digital photography. It was 90% fluff and puff (smoke and mirrors). The sensor is just 3.4 megapixels. Since they do capture 100% of the Red, 100% of the Blue, and 100% of the Green (in theory at least), they claim 10.2 megapixels. But in reality you do not get a true 10 megapixel result. Sigma SD15 has too small a sensor to be taken seriously. But if you already have it, you can use it. File size from a Sigma is only a fraction of what a Nikon or Canon can produce. Frankly nowadays a Sony might be better than a Sigma.



*NikonD100 Lens 200mm 2010*

I used the Sigma SD9 for a month, while teaching digital photography on the Island of Malta. It was a great camera; the body is the model for the Kodak SLR/c. But the green was weak; the blue was over exaggerated. The SD10 makes up for some of these problems, but introduces others. Compared with the Canon and Nikon cameras, the Sigma image quality cannot compete unless you happen to like some particular feature of it. The current SD15 is obviously improved in software, but none of the promises made by Foveon actually panned out. So they are still hyping a several-year old concept. I am sure it takes adequate photos, but why bother when Canon today can run circles around any Sigma. Even a good Sony camera in 2011 is better than any Sigma.



*Photokina 2010*

The Canon EOS-1Ds appears expensive and uses a CMOS sensor rather than CCD. The CMOS of both Canon and Kodak may give you digital noise in the shadows. If the photo is underexposed, it may show excessive noise when you correct the exposure in software. But today in 2011 the sensors, and software to correct issues, are significantly improved. Four years ago I would not touch a CMOS system. Today I am content with the photo quality of the Canon cameras.



The Canon EOS- 5D was a waste of money. I gave it to my assistants and bought a Nikon D300 instead and am more content with the Nikon D300.

Then the model II of one of the EOS came out. Canon kindly loaned it to me for evaluation, but this model was so inadequate it could not focus in low-light. Unfortunately for Canon, my test location was the largest cave in Slovenia (south of Austria, Slovenia is the northern part of former Yugoslavia; we often do our test photographer in Slovenia). This Canon was so awful I returned it to Canon and did not even bother to finish my evaluation. I saw no need to write about a totally inadequate camera.

But then I recently obtained a Canon EOS-1Ds Mark III. It is better than any previous Canon camera and so far I am very content. It is frankly good enough that I have no interest to experiment with the Nikon top of their line. I would perhaps try the Nikon D700 only to replace my D300 (I use these cameras for photographing at trade shows and for site-visit case studies; the Canon would be overkill for those applications). But I don't see any current Nikon that can come even close to the Canon EOS-1Ds Mark III.



*Nicholas Hellmuth holding a Canon EOS1Ds Mark II  
Photokina 2004*



*Pentax Photokina 2010*

### Why not Olympus or Pentax?

The sensor of the Olympus 35mm SLR is too small; that camera is grossly overhyped, primarily by highly paid photographers (most of whom don't actually use the Olympus in their own work). Besides, the Nikon D100 (and D70) is a known entity as well as a great camera.

### General comments

Full-frame digital cameras may distort at the edges with ultra-wide lenses. But you will not use that kind of 14 to 15mm lens on a painting.

### Why don't we mention Leica more?

I used Leica cameras for decades. I still have my Leica R3, R4, and R5: in dead storage in a closet. Leica sells cameras to people who need the red brand logo to impress their friends. Leica is rarely used today by most pros. Leica is more for photo-journalism anyway. I have not even looked at a Leica for over 15 years. Even at Photokina 2010, the only reason I went into the Leica booth was because the toilet nearest our exhibit area was at the back of the huge Leica booth (FLAAR had an exhibit at Photokina 2010).

Leica never understood that a digital camera is 90% software and only 10% hardware, and that without software good lenses are no particular advantage. Fortunately, there are enough people who crave the red Leica logo in China, Russia and elsewhere, that they sell well enough that Leica had a booth six times larger than the Kodak booth at Photokina 2010. Leica's booth was two to three times large than the entire Hasselblad booth!



*Nicholas holding a Leica Photoplus 2003*

The Leica R8/R9 digital hybrid, based on Imacon software, is not yet convincing in the real-world experience. I gave up on Leica over a decade ago.

The Leica M9 and newest Leica digital camera, S-System, are too-little, too-late. I am sure that thousands of well to-do aficionados will enjoy these Leicas (I loved my R3, R4, and R5; until I got a Nikon at half the price and about the same quality). Besides, a Hasselblad image for a slide lecture projected with a Rollei or Hasselblad projector blew my audiences out of their chairs with a quality they had never seen in their years of Kodak or even Leica projectors.



*Nicholas holding a Leica Photokina 2004*

## Aligning your CCD parallel to your painting

Whether you use a 4-megapixel zoom-lens camera, a 10 to 21 megapixel 35mm SLR, or a large format Better Light, you still have the same problems of parallelism. Because of the way large format cameras are constructed it is a lot easier to align your large format camera precisely with the painting (using a Zig-Align system). There is a separate FLAAR Report on the Zig-Align system.

A giclee is a re-creation of a painting, a photograph, or any other design which you define as art. If the original is a painting or a large photograph, your camera has to be absolutely parallel (aligned) or your photo will be slightly out of focus on the side of the camera that is off a few millimeters. The higher the resolution the more likely you are to have the error of mis-alignment visible in the final result. At million-dollar art shows, such as the Atlanta Art Deco, an embarrassing number of the giclee prints were sadly out of focus or otherwise were poorly photographed before they had been printed.



*Canon Cameras Photokina 2010*



*Carl Zeiss Camera Canon Photokina 2010*

This is partially a result on the exaggeration of interest in wide format printer resolution, dpi, and picoliter drop size. Not one of these specifications is meaningful if your photograph is poor to begin with. A higher resolution, a better picoliter size, will merely better reproduce the flaws that are inherent in your photograph.

You can jerry-rig a parallel alignment with a smaller simpler camera. This implies having a carpenter's level and a defined area to set the painting for photographing it. A good copy stand is better than trying to get a camera on a tripod parallel with a painting on a wall (walls are not necessarily plumb to the floor). I have seen some of the most amazing hand-made alignment systems (rigid parallel piping all the way from the camera to the area where the painting is hung). 99% of these home made systems will result in distortion (we see it at million dollar giclee and décor trade shows every year).

But with levels and plumb bobs, you can get your painting approximately parallel to your camera sensor. If you are using a 4 to 6 megapixel camera your sharpness and detail will be limited anyway, so you (and your clients) may never notice how fuzzy the image really is (until you see the same painting photographed with a BetterLight or Cruse).



### How to overcome Deficiencies of 35mm Cameras

You can mount certain models of 35mm digital camera bodies directly onto a 4x5 camera. The Cambo Ultima, Arca-Swiss and a few other comparable brands of large-format cameras accept the Canon EOS 1Ds, Kodak SLR/n, Nikon, and a few other bodies. With this hybrid system you use the camera CCD or CMOS sensor but with Schneider or Rodenstock lenses. These lenses are far superior to even the best lenses for 35mm cameras, especially for photographing flat surfaces.

Once you have any 4x5 camera you can more easily use a Zig-align system, so you have many of the advantages of a 4x5 without the expense of a larger format camera back. However if you are a commercial lab or studio, your customers will expect you to be using a BetterLight or a Cruse.



*Nikon Cameras and Lenses Photokina 2010*

## Summary

Every artist, photographer and print shop owner asks what brand and model of printer will be used to render their fine art giclee. They discuss the ethereal benefits of piezo vs thermal printheads. They expound for hours on inks, media, and longevity.

In other words, everyone asks only about what inkjet printer to buy! But this is not the question: the question should be: how will the work of art be digitized to begin with. You can't print it until you digitize it.

But there are two voices calling out in the wilderness, that of Nicholas Hellmuth, and independently of Gary Kerr. Nicholas had his website on digital photography as many years as he has managed his website on giclee printing. Nicholas is probably the only giclee specialist in the world with both a BetterLight and a Cruse.

Gary is the foremost giclee photographer in the US. He is now even being hired to work in Europe because his techniques are the best that money can buy. Both Kerr and Hellmuth reached the same conclusion independently of each other:

- The digitization of the painting, poster, or historical map is more important than what printer, ink, or media it is printed on.
- Most digitization, whether scanning or direct digital photography, is done with equipment neither made to accomplish this task nor in a studio that is equipped to photograph paintings to reproduce as giclee. The dpi of the printer is irrelevant in the face of having a typical digitized painting, which is guaranteed to have the following faults (in the words of Kerr):
- Blurry (poor focus, usually worse on one edge or corner than on the rest of the image)
- Specular highlights (gloss and glow where you don't want it)
- Light fall off

What both Kerr and Hellmuth stress is that you need (in the words of Kerr):

- Texture
- Detail
- Sharpness

And it is precisely here where large-format has the advantage, with medium format very close. It is in these areas where 35mm is weakest (in comparison to medium and large format).

## Conclusions

### Advantages of Entry Level Cameras

- You probably already have an entry-level camera, so you can get started with no extra expense.
- You hopefully know how to use your own camera, so you don't need to take lessons to get started.

### Disadvantages of using Entry Level Cameras to Digitize your Paintings

- Small file size: you can't enlarge your giclee much
- May have poor gray balance or white balance
- May have too many features that are automatic (which you can't easily control)
- Viewing mechanism may not allow precise focus
- Alignment may be haphazard
- These are all 1-shot cameras; so everything is interpolated, especially the colors.
- Lenses are not specialized for flat-field subjects.

But if your budget is tight; and your time is tight also, and you want to start printing giclee now, yes, you can use your 35mm DSLR. Forget about using film: that is a waste of time. You have to scan your film and then you will get the artifacts from film grain. Go digital from the beginning.

- If you want true professional quality, go medium format.
- If you want even better giclee quality, go large-format: Better Light or Cruse
- If you want to feel a great camera body in your hand, go for Leica.
- If you want a practical professional camera, go for Canon EOS 1Ds-Mark III
- If you can't afford any of the above, opt for the Nikon D300s or very similar D700.

This is based on visiting Photokina 1998, 2000, 2002, 2004, 2006, 2008, and 2010, and thirteen years evaluating digital cameras, but our FLAAR Reports can present all this experience in the above five simple bullet points.

## The Photo Equipment Segment of the FLAAR Reports Series on Giclee

The present Part I covers basic entry-level cameras to record paintings for subsequent giclee printing.

- Part II covers medium format cameras.
- Part III covers large format cameras.
- Part IV covers copy stands (for all sizes of camera)
- Part V covers the Zig-Align system for giclee photography with large format cameras.
- Part VI covers wide format scanners (which we do not recommend, but we added this report since full-page ads in trade magazines are showing this kind of scanner being used to produce giclee. We feel that people should be warned of the downsides).
- Part VII covers the dedicated (turnkey) Cruse reprographic camera, the ultimate professional system for a giclee atelier.

### For further information

Once you have your camera, to learn what lighting, tripod, and accessories, FLAAR offers an entire course on digital photography, with over 30 comprehensive learning units. For people who only want to learn those aspects which pertain to digital capture of their oil paintings or watercolors, we have separate FLAAR Reports as part of **Options for Photographing Paintings to reproduce as Giclee Prints**

For the workflow we have an additional series within the Giclee Set to discuss primarily the step by step aspects, the sequence of work.

Since Nicholas is often away lecturing around the world, if you can't reach him, you can obtain abundant information from the giclee and fine art team at Parrot Digigraphic: e-mail [JLorusso@parrotcolor.com](mailto:JLorusso@parrotcolor.com).

Since summer, Nicholas was lecturing in Johannesburg, Mexico City, Abu Dhabi, Brussels, and then San Jose Costa Rica, so is not always available. But the experienced giclee, scanning, printing, and color management staff at Parrot are available all year long.

There are about a dozen professional quality photo stores across USA and Canada that have the personnel and equipment with enough experience to provide what a professional needs.

There are several low-bid places for box-pushers: Amazon, B&H.

There are several places which are not box-pushers: Calumet is one; but they are not specialized in giclee and don't have experience with Cruse

In all of North America (USA and Canada) there is only one single solitary dealer (that I am aware of) that has, in-house!, a Cruse, a Better Light, a Hasselblad medium format, and a Canon EOS system for your perusal and comparison, in-person, all in one convenient demo center.

This means, that in all of North America, there is only one place that has experience in every single kind of giclee capture system. Plus they offer RIP software, color management hardware and software.

And, more important than any brand, more important than megapixel size, there are individuals here who actually know how to operate a large-format tri-linear scanner. Actually know how to handle a medium-format Hasselblad, and know Canon cameras for years. Plus: they have 100% of the available large-format giclee capture systems: both Better Light and Cruse.

So they can do test scans for you, with any and every capture system you could possibly think of. Simply negotiate a fair price for the test scans, and pay up front. If you buy any one of the systems, ask for the cost of the test scans to be discounted from final system price. This is fair to both you and to the time and effort they put into the digitizing your giclee test image.

## Footnote to History

- Kodak produced one of the first professional-quality digital cameras, long long before Nikon or Canon. I used this early Kodak DCS 420: \$28,000 for less than 4 megapixels.

- Kodak produced one of the first portable (non-tethered) medium format digital backs (I used this digital back and got awesome photos years ago that still look top quality even when compared with Hasselblad or Phase One today).

But then Kodak came out with a simply awful camera about 2002, the DCS Pro 14n. Their PR agency was brilliantly inept in handling criticism and alienated virtually the entire pro photography people around the world.

I can still remember when Kodak flew me and an assistant to the Athens World Olympics (all expenses paid) and when I asked to borrow their newer model to evaluate it they were so nervous they said, “sorry, we don’t have one available for you to use.”

Here was Kodak, sponsor of the Olympics, spending several million dollars to fly photographers from all over the world and renting an entire hotel for the entire Olympics, whose rooms cost \$4000 PER NIGHT, and they said they did not have one single solitary Kodak camera available.

I humbly pointed out there was a complete Kodak SLR/n in the glass exhibit case in their own hotel lobby just a few meters away from where they were telling me they had no cameras available! Kodak, the manufacturer, having not one single camera. hmmm

I published this lame excuse within 3 hours of them trying to find an excuse why not to risk loaning me an evaluation unit.

24 hours later (after I called-their-bluff) there was a Kodak Professional DCS Pro SLR/n digital camera on the breakfast table for me to borrow (for several weeks).

I took the DCS Pro SLR/n camera to the Greek island of Hydra, and got some of the absolute best shots in 12 years of digital photography: gorgeous detail in shadow area yet whites held without burning out. No other camera could do this well in a scene with Mediterranean sunlight on white walls yet deep shade under the roof.

This last Kodak digital camera turned out to be significantly improved over the 14n, but too much damage had been done to the brand name by how Kodak tried to dodge critique of the 14n by pretending there was nothing wrong with it.

Canon and Nikon took over the market.

At Photokina 2006, the largest booth at Photokina was that of Kodak.

At Photokina 2008, the Kodak booth was pathetic: there was nothing left of their photo division.

At Photokina 2010, the Kodak booth was more than pathetic, it was so small it was embarrassing, and the primary occupant was a nice father-and-son team of 8x10 camera manufacturers who were showcasing 8x10 Kodak chromes. As if the digital revolution had never happened.

The history of how Kodak bought Encad and then totally blew away umpteen million dollars with one of the most inadequate wide-format printers every launched (Kodak 5260) is a separate story.

Then Kodak bought CreoScitex and dumped the highest quality digital back (Leaf) and the absolute best flatbed scanner every made (Scitex).

It is amazing how the management style of a single company has had so many monumental failures yet still survives (or at least limps along). I hope that graduate schools of Business Administration can learn from the Kodak executive and management style and save other American companies from such utter stupidities. Kodak sure must have had zillions of dollars of profits from their heyday of Kodachrome film profits that have kept them afloat as they bungled one digital opportunity after another.

If the Chinese flag some day waves over the city of Rochester, it is because the Chinese are business savvy. Even the Japanese FujiFilm did better than Kodak (even though Kodachrome was the better film in it's day; FujiFilm cleverly pumped up the green and blue of their FujiFilm films which made resulting photos look gorgeous (even if the color was fake). Within a few years many if not most photographers switched away from neutral Ektachrome to the eye-catching (albeit fake) colors of Fujichrome.

#### **Bibliography:**

[www.nikonweb.com/files/DCS\\_Story.pdf](http://www.nikonweb.com/files/DCS_Story.pdf) is the best history of any digital camera I have ever read. They even slightly admit that the 14n had a few issues....

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