



Digital Ice—before, left, and after, right.

### Applied Science Fiction

If a few years ago someone had asked us if we thought it would be possible to remove scratches and dust from film with the touch of a button, we would have told them it was utterly impossible. When asked whether we thought film could be processed without chemistry, we said it sounded like science fiction. Believe it or not, a company called Applied Science Fiction turned all these and many more “what ifs” into reality.

Founded in 1995, the scientists at Applied Science Fiction were determined to perpetuate photography by developing new ways to incorporate photo imaging

and technology. The folks at ASF weren’t interested in marketing new products, only new ideas. They researched and developed the ideas, proved they would work and then licensed them to OEMs, (Original Equipment Manufacturers), to produce an end product.

### Digital Ice

Their first innovative technology called Digital Ice, Digital Image Corrective Enhancement, was introduced in 1998. Digital Ice identifies surface defects on film as it is being scanned. A separate defect or “D” channel detects only

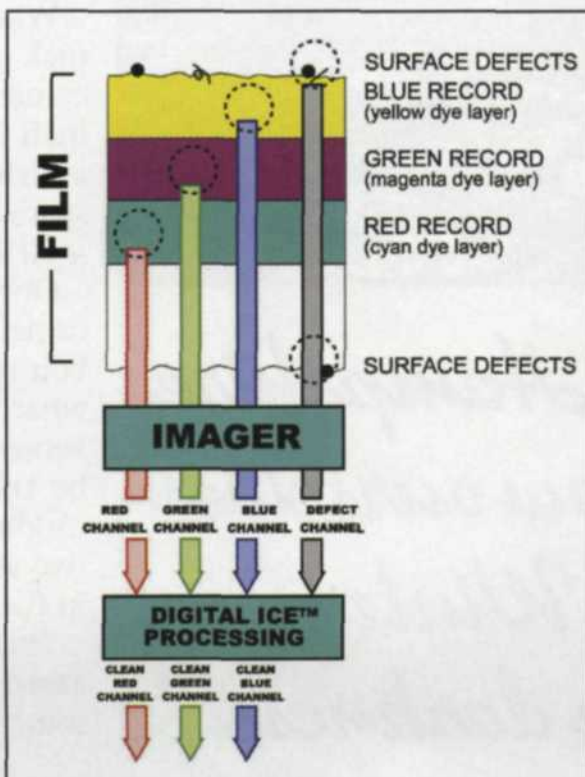
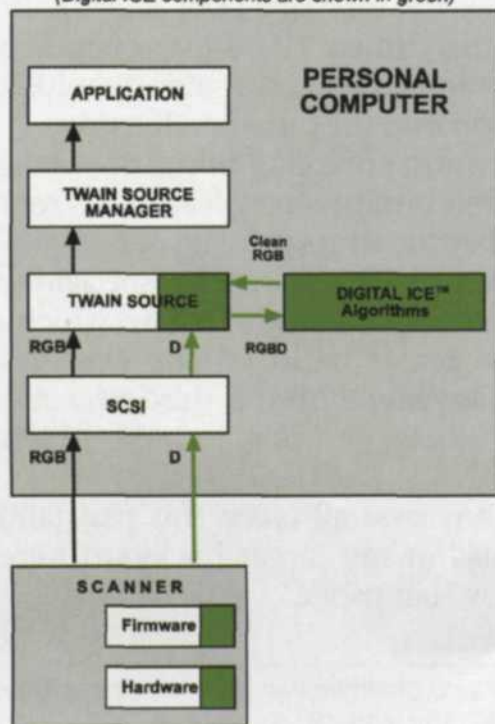
things on the surface, not embedded in the film. Through sophisticated proprietary algorithms, the defects are effectively “erased” without degrading the image itself. Ice efficiently removes years of damage to an image, unwanted dirt, dust, fingerprints, fungus growth and scratches with the touch of a button. With the flatbed scanners, besides removing unwanted surface dust and scratches, it also allows folds and cracks in a print to be whisked away.

This technology is available in certain film scanners, minilabs and flat bed scanners utilizing Digital Ice technology. Some of the products incorporating

### Typical Block Diagram

#### Desktop System

(Digital ICE components are shown in green)



Film cross-section



Digital ROC—before, top, and after, above.



Digital Ice are Nikon Super Coolscan 2000, Nikon Coolscan III, Acer ScanWit 2740S, and Gretag's Master Flex D 1008 digital microlab.

### Digital ROC

A second technology, called Digital ROC, Reconstruction of Color, is a new software application designed to restore the original color to faded and off-color images. The program uses a set of proprietary algorithms that reconstruct the image during the scanning process to provide a final image that closely resembles the original image. When used in the basic operating mode, Digital ROC can be turned on or off. While using the advanced mode, it has the ability to tweak and profile the specific device to the customer's preferences. Once the image is run through the Digital ROC process, it can then be imported in an editing program such as Adobe Photoshop, if any further adjustments are required.

### Digital GEM

For the photographer who enjoys using higher speed films and is constantly dealing with their increased grain, ASF has a solution for them too. Grain Equalization Management or Digital GEM is a technology that analyzes the grain structure of the film being scanned and then algorithmically removes or reduces the grain structure. This technique is a great help for the APS film format since it is 40% smaller than 35mm and has larger grain structure when enlarged. Since higher speed films allow for better control of low light, this new Digital GEM technology provides the high speed shooter new image control.

Minolta features both the ROC and GEM technologies for enhanced images in its Dimage Scan Multi II, multi-format film scanner.

### Digital ICE

If you combine the ICE, GEM, and ROC technologies into one machine you have the new Digital ICE technology. This suite that combines all three technologies is pretty new, but expected to be included with many of the new scanners being introduced in the next few years. Nikon just announced the Super

Coolscan 4000 ED film scanners that uses this Digital ICE technology. Pixel Magic also incorporates all three ASF technologies in its new generation of photo kiosks.

It was estimated that in 1998 more than 450 billion images were being stored in shoeboxes, photo albums, libraries, file cabinets, and a dozen other

places that cause a photographer to cringe. The bulk of the time required for converting traditional photographic images to digital is spent editing dust, scratches, color fading, and film grain. The best part of all this ASF technology is the editing time you will save fixing images damaged during handling or storage.

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Digital GEM—before, top, and after, above.

Even with samples and illustrations of how this technology worked, we found it still a little hard to believe. We weren't going to just take their word for it, we



Digital GEM—before, left, and after, right.



were going to run our own tests. The biggest problem was that we take very good care of our images, and finding one as abused as their samples was difficult. So, we looked for several images that had several duplicates or "seconds." We then collected a variety of abusive tools like sandpaper, staples, paper clips and began creating our own set of damaged images.

We scanned the totally unusable images into our LS-2000 with the ICE turned off. That is actually pretty easy, as the command on the LS-2000 is hidden, and the default setting is off. At the bottom of the scan menu is a feature called extras. When we selected this menu, we saw a command called "clean" which is really the ICE command. We then

scanned the same damaged images with the "clean" turned on. We were shocked because the difference between the two scans was like night and day!

Now we had ourselves a real problem. All those images we scanned a couple of years ago on our Nikon 3510 could have been scanned on the LS-2000 using the Digital ICE technology. Instead of hours of digital repair, we would have had virtually no editing for dust or scratches with ICE.

We were really curious exactly how much time we could save with this new technology, so we tried to fix a couple of the scanned images



Digital ICE—before, above, and after, right.





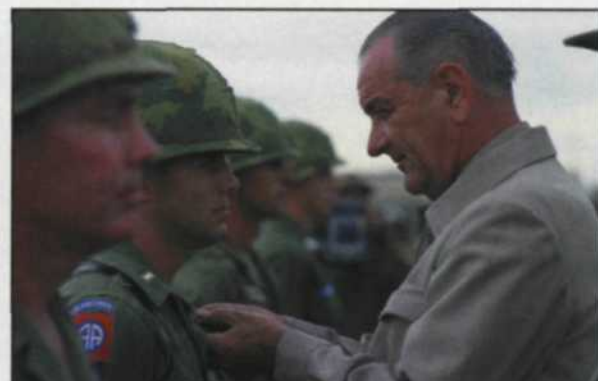
with no ICE. Since the damage was severe, it took a couple of hours on each image to make them presentable. Using the Digital ICE command, the images were fixed in less than two minutes and looked identical to the ones that took us hours to repair. We did notice that it took twice as long to scan with Digital ICE turned on. If you look at the time it takes to repair scanned images, this extra scan time is well worth it.

### Digital Dry Film Process

Applied Science Fiction's latest technology Digital Dry Film Process, requires no water supply, generates no hazardous waste, reduces the labor required to process film, and doesn't even generate a final film negative. It is designed to bridge the gap between photography and digital imaging. As the film is run through the dry process, each exposed layer is scanned and combined into one complete digital image. The digital file is then sent to a variety of storage devices



Digital ICE—before, above, and after, right.



such as Zip, CD, or DVD. This processor will be attached to a digital color printer, so the film can be dry processed, stored, and printed directly onto color paper. The customer walks away with prints and digitally stored images that can be reprinted at a later time. This new process is expected to start showing up in some printing labs in the very near future.

If you are like us, you would rather spend more time taking pictures than processing, scanning, and transferring photos into image libraries. The way we see it, Applied Science Fiction just gave

us all more time to concentrate on taking pictures. If this is what Applied Science Fiction can design in just a few short years, just what does photography's future hold when in their hands? Pretty exciting, huh?

For more information, on Applied Science Fiction products, log on and check [www.asf.com](http://www.asf.com).

*Jack and Sue Drafa are freelance journalists/photographers living in the Pacific Northwest. They have owned and operated a custom lab and service bureau, Image Concepts, for many years. They can be reached at: [concepts@pacifier.com/](mailto:concepts@pacifier.com/).*

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