

## A digital bargain?

A high-performance digital SLR at an unprecedented price

Nikon is really starting to make me mad. You see, I've been trying to finagle a raise. My argument is that I need the money to buy the latest, greatest digital SLR.

I'm an editor for a photography magazine, after all. Shouldn't I be shooting with the newest wow machine in the world of digital capture? "Alas," I say to my boss with a pathetic pout, "High-quality digital SLRs are so expensive. I'll never be able to

afford one on my salary (sniff, sniff). If only I brought home a little more money, I could save up for one of those \$6,500 juggernauts and become the best photo magazine editor in the world." I could tell I was winning her over.

And then along comes the Nikon D100, a 6.1- (effective) megapixel (eMP) digital SLR with enough features to please a pro and the usability to accommodate an amateur. It has impressive autofocus capability, D-TTL flash operation, and a full complement of automatic and manual exposure settings. Inside, the 3D Digital Matrix Image Control uses an image-

processing algorithm that yields faithful color reproduction, the 3D Matrix Metering facilitates exposure control, and the one-chip system of the Large Scale Integrated Circuit allows fast image processing. The D100 has a variety of high-resolution capture modes, producing images up to 3,008x2,000 pixels. All this at a street price less than \$2,000. Yes, under \$2,000. This is a landmark in performance for price, one sure to cause more than a ripple or two in the photographic industry. Unfortunately, this price also means that my boss will never give me a raise, at least not to buy a high-quality digital SLR. Thanks a lot, Nikon.

### How it feels, where it fits

Straight out of the box, the D100 digital SLR feels like a light, compact, yet sturdy, camera. It measures 5.7x4.6x3.2 inches, and minus the battery, weighs just 24.7 ounces. The comfortable rubber grip and manual control layout will remind longtime Nikon users of the company's 35mm film models, especially the F100 and N80. This manual feel is no accident, as the camera is Nikon's appeal to the large contingent of advanced amateur and business photographers who are still dipping their toes in the digital pool.

Marketing the D100 to the advanced amateur is a testament of how far digital photography has advanced. With 6.1 eMP and a CCD identical in size to the professional-grade Nikon D1X and D1H (23.7x15.6mm), the D100 would have all but ruled the roost among professional SLRs just a few years ago. As recently as 1999, cameras of similar quality were commanding \$6,000 or more, which



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The Nikon D100's 3D Digital Matrix Image Control uses an image-processing algorithm to produce accurate color rendition, seen here in these brightly colored flowers photographed in natural light on a partly cloudy day.



©Joan T. Sherwood

Ideal for fast-action photography, Continuous Servo AF constantly readjusts focus while the shutter button is pressed halfway down. Dynamic AF shifts focus between Nikon's five focus areas to better track and focus on irregularly moving objects. Image captured with an 80-400mm f/4.5-5.6D ED VR AF Zoom-Nikkor lens.

makes the D100's sub-\$2,000 street price look like a true bargain.

But it's no longer 1999—can this camera compete for those precious dollars of 2003? Can it offer the performance that discerning photographers are looking for? Clearly, the D100 falls short of the optimized resolution capability of the Nikon D1X and the pure capture speed of the D1H, but not everyone needs enormous files or a capture rate of 5 frames per second (fps). For them, the D100 is a reasonable substitute. The NEF RAW-format capture files are big enough for a long list of applications, and the 2.5-fps capture rate will do for all but the most intense action photography. With these qualities, the D100 is a fine choice of a versatile, manageable digital SLR that can deliver professional-quality images at a sub-professional price point. The D100 joins cameras like the Canon D60 and Fujifilm FinePix S2 Pro as a tough contender in the emerging digital camera class that falls

between high-end consumer models (\$800 to \$1,000) and the pro-grade super SLRs (\$5,000 and up).

### Changing lenses and finding focus

The D100 is compatible with all Nikon F-mount lenses—the majority of Nikon's 35mm lenses. The D100 has 1.5X angle of view, causing an apparent magnification that, for example, gives a 24-85mm lens the same angle of view as a 36-127mm lens.

The focus modes are set with a small dial on the front of the body. In addition to Manual mode, the D100 has two autofocus modes, Single Servo AF (focus priority) and Continuous Servo AF (release priority). Single Servo AF is best for still subjects, as it prevents the shutter from releasing until the lens has completely focused. Continuous Servo AF allows shutter release regardless of focus status, though in this mode the camera will continually readjust the focus as long as the photographer keeps the shutter button pressed halfway down.



### specs: Nikon D100

**Resolution:** 6.1 million pixels (effective)

**Bit depth:** 8 bits per channel; 12 bits per channel possible with NEF files, which convert to 16 bit when processed using Nikon software.

**Metering options:** 3D Matrix Metering (10-segment SPD), Center-weighted, Spot

**Viewfinder details:** Approx. 95% coverage, 0.8X magnification, fixed Nikon B type Bright View Clear Matte screen II, grid on screen can be turned on and off

**Autofocus range:** EV -1.0 to EV 19 (ISO 100) (Comparably priced Canon D60 starts at EV 0.5. Nikon D100 performs better in dim light.)

**Lens options:** All currently produced Nikkor lenses and many older Nikkor lenses, as well as third-party lenses with a Nikon mount (with some limitations).

**Shutter range:** 1/4,000 second to 30 seconds plus bulb

**ISO settings:** ISO 200 to 1600 equivalent

**Flash options:** D-TTL, non-TTL auto flash with off-camera Nikon Speedlight

**Burst rate:** 3fps for all file types

**File types:** JPEG, TIFF, NEF (RAW)

**Sensor type, size:** RGB filtered CCD, 23.7x15.6mm

**MSRP:** \$2,495.00; street price: under \$2,000

You can switch between Single Area AF and Dynamic Area AF via the AF Area Mode setting on the Mode dial. In Single Area AF, the camera establishes focus using a single focus area on the subject. Dynamic AF uses all five of Nikon's autofocus areas, allowing the camera to follow the subject through the frame by first establishing the focus for the central area, then shifting the focus as the subject moves to another focus area. It's an ideal feature for subjects that move irregularly.



Stepped-up exposure to keep clouds from blowing out



Stepped-down exposure to show detail in trees



Blended exposures for the best of both

## Solving the software

The camera ships with Nikon View 5 software for transferring captures to a computer, viewing them, and doing limited image editing. The optional Nikon Capture 3 software gives you more complex imaging capability, as well as enabling remote camera operation from a computer. The Capture 3 Editor feature has a welcome do-over type control for images in the NEF RAW file format.

When you change the EV or white balance, the image will look like you captured it at those settings to begin with. In addition to correcting capture mistakes, this software allows you to do extensive experimentation with the look of your photos. There's a lot of creative potential here.

You can make changes in White Balance (by changing the color temperature or gray point); Advanced RAW settings (exposure compensation, sharpening, tone, color mode, hue, saturation); Noise Reduction; Curves; Color Balance; Unsharp Mask; and Size/Resolution.

You can save complex adjustments as a

set, then batch-correct the entire day's shoot. Or say there's a certain time of day when you'd like the puffy white clouds in the sky not to blow out, but you don't want to lose the nearly silhouetted foreground in shadow. Save one set of corrections with the exposure bumped up, another with the exposure stepped down, and then do a nifty gradient mask in Adobe Photoshop, without ever having to mess with Curves or Levels. (See photos above.)

## New twists and special features

In the Nikon D100 camera menu, the settings are divided into four categories: setup, playback, shooting, and custom. Most are what you'd expect, with some neat bells and whistles in the display mode, such as the ability to see the histogram, and blinking blown-out highlights.

What *really* amazes are the custom settings. There are 24 setting options, from an anti-shock mirror mode to a grid displayed in the viewfinder, to Dynamic AF options, to EV options in third- or

half-steps. You can even switch the function of the front and back command dials, making the main dial control the aperture and the sub-dial control the shutter. You can save your preferred settings to Bank A or Bank B and quickly recall them next time you use the camera.

The Nikon D100 may not be ideal for the most advanced professional applications, but it has the features, file sizes, image quality, and versatility to make it an attractive choice for a wide variety of uses, even some professional applications. Factor in the low street price, and many professionals might find themselves re-evaluating what they really need in a digital SLR. Nikon's betting on big things for this camera, and so are industry experts—some are predicting that the D100 will become Nikon's best selling camera of all time. Our prognostications are a little less grand, but the Nikon D100 digital SLR has earned our respect, even if the price tag has cost me a raise.

*Technology Editor Joan T. Sherwood contributed to this review.*

# Tech Report: D100 a good choice for weddings and portraits

BY BOB SHELL

The new Nikon D100 and the newest Nikon Speedlight flash units form a very interesting system from a technical point of view. First, the camera offers a broad selection of formats for image saving. In addition to three levels of JPEG compression, the camera offers the option to save files in NEF format (Nikon's version of RAW) or as camera-processed TIFF files. All except NEF offer three levels of resolution.

Although it's confusing at first, I think photographers will appreciate the ability to tailor the format, resolution, and compression of the capture files to suit each job. NEF files are 9.4MB each in size, and TIFF are 17.2MB, 9.6MB, or 4.3MB each depending on the resolution.

With the Nikon D100, you'll need high-capacity CF cards or Microdrives when shooting in the NEF or TIFF format, but for most applications, maximum resolution JPEGs will be sufficient. You have nine choices of JPEG file, three under Image Quality in the Shooting Menu, and three choices of resolution under each of these Image Quality settings. To get an idea of the average sizes of these nine JPEG options, I set the camera on a tripod and made nine exposures of a bookshelf in my office (see Table 1). Of course, JPEG size also varies with subject, but the relative sizes I determined should apply when photographing similar subjects.

**Table One: Approximate sizes of JPEG files**

|               | Fine  | Normal | Basic |
|---------------|-------|--------|-------|
| <b>Large</b>  | 2.5MB | 1.4MB  | 792K  |
| <b>Medium</b> | 1.5MB | 866K   | 448K  |
| <b>Small</b>  | 694K  | 378K   | 226K  |

The 23.7x15.6mm CCD image sensor yields up to 3,008x2,000 pixels. This is almost exactly the same 2:3 aspect ratio as the nominal 24x36mm film frame on a 35mm camera. This is important because 35mm film users can switch to this camera without having to relearn composition and framing in a different aspect ratio.

Color rendition is important to any serious photographer, and to meet this need the Nikon D100 offers two versions of sRGB as well as Adobe RGB. This, again, combined with the file formats and resolution choices, allows very precise fine tuning of the image files to the job requirements. To test the differences in the three color modes, I made photographs of the GretagMacbeth Color Checker in all three modes. I examined them visually on my calibrated monitor and also used the eyedropper tool in Adobe Photoshop 7.0 to take measurements of the color swatches of the Color Checker.

Visually, it is obvious that images captured in Adobe RGB mode are less saturated than the other two modes. They also measured neutral in the gray scale patches. For images in which critical color accuracy is important, it may make sense to use Adobe RGB to get the maximum color information and then make any needed increase in color saturation after the fact.


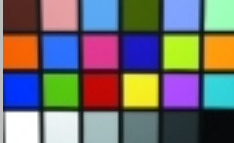

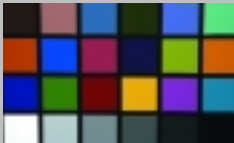
Color Mode I is an sRGB mode balanced for skin tones, and produces the best results on the Color Checker patch intended to mimic Caucasian skin while still keeping the grayscale remarkably neutral and exhibiting good saturation. Color Mode III is optimized for landscapes and scenics, favoring reproduction of blues and greens, but still managing to keep the grayscale neutral.

I'm used to doing most of my testing with grayscales and initially was surprised to find so little difference in the three color modes. After some telephone conversations with Nikon and more time

on the computer, I realized that you can't evaluate this camera's color modes using only neutral gray scale test targets.

You can evaluate the camera's ability to achieve proper white balance under different light sources (see Table 2). Direct sun and hazy sun tests were made with the white balance set for direct sun, while both of the flash tests were done with the white balance set for electronic flash.

**Table Two: GretagMacbeth Color Checker Results With Varying Light Sources (Adobe RGB Color Mode)**

| Photoshop Measurement of: |   | White | Black |   |
|---------------------------|---|-------|-------|---|
| Direct Sun                | R | 216   | 25    |    |
|                           | G | 208   | 25    |   |
|                           | B | 196   | 17    |   |
| Hazy Sun                  | R | 255   | 2     |    |
|                           | G | 255   | 4     |   |
|                           | B | 255   | 1     |   |
| On-Camera SB-50DX         | R | 208   | 15    |   |
|                           | G | 209   | 16    |   |
|                           | B | 210   | 20    |   |
| Studio Flash (Profoto)    | R | 255   | 7     |  |
|                           | G | 251   | 11    |   |
|                           | B | 251   | 8     |   |

One major advantage of the Nikon D100 is that it works with the Nikon DX Speedlight flash system. This system uses both a measured preflash as well as distance information from Nikkor D lenses to compute flash exposure with great accuracy. It is important to realize, though, that because flash exposure determination requires the Speedlight to produce a preflash shortly before the exposure, you cannot use ordinary flash slave systems to fire remote flash units. Some Nikon Speedlights can be used off-camera and will synchronize properly when the triggering flash, or on-camera flash, is set to manual. If you are used to using an on-camera flash in the studio to synchronize your studio flash system, you will either have to switch to another way of firing your studio flash or use one of the new Wein Digital Slaves which are made specifically for this purpose.

Although the Nikon D100 is not as rugged as the D1 series of cameras, it is also much lighter. Those of us who don't put our cameras through the rough and tumble lifestyle of war correspondents will probably find the D100 up to just about any task. With its excellent autofocus performance and flesh tone rendition, it could be the perfect camera for wedding photographers. For portrait photography, the file size is large enough to produce prints in the most popular sizes. I would not hesitate to recommend the Nikon D100 digital SLR for most types of photography. □