

## The challenger

Despite minor flaws, Canon EOS 20D delivers top features and response time at affordable price

It might not seem quite fair, at first, to compare an entry level digital SLR like the Canon EOS 20D to the top of the line 1D Mark II, priced some three times as much (street price \$4,500; \$1,500 for 20D).

But it's not totally unfair—the 20D stands up surprisingly well in the comparison. Certainly, there are some differences, but not nearly as great as the difference in price suggests.

Though the 20D is priced about the same as the earlier 10D, it's faster and has a higher resolution sensor. It has a rated shooting speed of 5 frames per second with a total burst rate of 23 JPEG frames. When shooting RAW, according to the specs, it can capture six frames in a single burst in either RAW or RAW plus JPEG mode. Its RAW capture format is the new CR2 RAW, the same as the Mark II's.

The 20D achieves its speed through a new four-channel data transfer system that lets the camera multi-function. It can read and write to the CF card while continuing to shoot. That results in a significant increase in write speed and a reduction in the overall time it takes to clear the buffer.

While the actual speed didn't quite match Canon's claims, the results were impressive. In repeated tests, done unscientifically with a stopwatch, the camera was consistently able to take 2 to 3 frames per second to a maximum of 21 to 31 frames, capturing images at the highest resolution in the JPEG mode and writing them to a high-speed SanDisk Ultra II 516MB CompactFlash card.



The newly engineered DIGIC II image processor in the Canon EOS 20D improves color accuracy in highly saturated subject matter and white balance capability.

The camera was also only slightly slower than stated when capturing RAW images. Up to six frames could be fired off in less than three seconds. The next three frames fired at roughly one per second, then the RAW capture rate dropped to about one every four seconds. While that doesn't match the 8.5 frames per second of the Mark II, it's very good for what might be considered an entry-level professional digital SLR. (The Digital Rebel costs about \$600 less, but it's designed more for consumers than the 20D.)

The 20D is not only fast when shooting, it's also fast on start-up, just 0.2 seconds. That's 11 times faster than the 10D. Shutter lag, which can be a problem with more affordable digitals, is only 65 milliseconds, virtually eliminating lag as a consideration.

Overall, the new 20D handles and shoots very much like a 35mm SLR. The magnesium alloy and stainless steel-bodied 20D is considerably smaller than the Mark II. It's even slightly smaller than the original 10D. The body weighs only 24.2 ounces.

The new camera is compatible with the entire line of Canon EOS System equipment, including EF and EF-S lenses and most EOS accessories. I used an EF 16-35mm f/2.8 and an EF 28-135mm f/3.5-5.6 IS (image stabilization) lens for this test drive.

Its new 8.2-megapixel CMOS sensor can capture images with a maximum resolution of 3,504x2,336 pixels. That's about the same as the Mark II (and 1.7 megapixels higher than the 10D). But the sensor is smaller than the Mark II's, which is the size of a 35mm frame. The 20D's 8 million pixels are crammed onto an APS frame-sized sensor. Since it is a smaller sensor, the 20D does have a 1.6X lens conversion factor. On the upside, that extends the telephoto range of 35mm lenses by 60 percent. The main disadvantage is that the wide-angle coverage of is more limited.

Canon has improved the design of the photo diodes in the CMOS sensor by eliminating transistors in each pixel. That makes a greater portion of the surface area of each pixel sensitive to light. It also has an improved signal-to-noise ratio. The new second-generation three-step, on-chip

noise reduction circuit significantly reduces unwanted artifacts.

That improves all images it takes, but particularly images taken at higher ISO settings. Shooting at ISO 1600 with the 20D will result in roughly the same added noise as shooting at ISO 400 with the 10D, a significant improvement for low-light photography.

Besides the new four-channel data transfer system and redesigned CMOS sensor, there are numerous other technological advances incorporated into the new camera. The brains of the unit is a newly engineered DIGIC II image processor, which, while it's not the same processor as the one in the Mark II, shares much of its advanced technology. It provides high-speed parallel data

## specs: Canon EOS 20D

**Sensor:** CMOS, 8.25 effective megapixels (3,504x2,336 pixels) with DIGIC II image processor

**Metering:** Maximum aperture TTL metering with 35-zone SPC, evaluative metering, partial metering at center, center-weighted

**Shutter:** Vertical-travel, mechanical, focal-plane shutter with all speeds electronically controlled, 1/8,000 to 30 seconds, bulb, X-synch at 1/250 second

**Frame rate:** 5 fps up to 23 consecutive frames

**Sensitivity:** ISO 100 to 1600 (3200 available via menu selection)

**White balance:** Auto, six standard modes, custom, compensation +/- 9 steps, white balance bracketing possible

**File format:** JPEG, RAW, simultaneous JPEG and RAW

**Autofocus:** TTL-CT-SIR with AF-dedicated CMOS sensor, one-shot AF, predictive AI Servo AF, AI Focus AF, manual

**Flash:** Built-in pop-up, GN 13/43 (at ISO 100 in meters/feet); EOS-dedicated Speedlite E-TTL II auto flash with EX-series Speedlite. PC terminal provided, not sensitive to PC card polarity

**Lenses:** Fully compatible with entire Canon EOS System, including EF and high-value EF-S lenses

**Storage:** CompactFlash Type I and II, Microdrive

**Interface:** USB 2.0 High Speed

**Street price (with lens):** \$1,599



processing for each of the four sensor output channels. With it, the camera has a wider dynamic range, more accurate color reproduction of high saturation subjects and improved white balance capabilities.

White balance has been improved over the EOS 10D to make it possible to capture more accurate color. The 20D calculates the flash's color temperature when image processing. Nine white balance settings are available, ranging from fully automatic to manual. White balance bracketing of up to plus-or-minus three stops is available.

The EOS 20D has broad selection of creative options. There are 12 separate shooting modes, including five Creative Zone modes and seven Basic Zone modes. Creative Zone modes control fundamental camera options. They include standard Program AE, Shutter-Priority AE, Aperture-Priority AE, Manual and Depth-Of-Field AE. Basic Zone modes automatically set the camera for specific types of shooting, such as sports, landscapes and portraiture.

Besides the standard settings, there are also 18 Custom Functions with 50 settings available. These can be used to control the

flash sync, change exposure setting increments, lock the mirror up and change the AF point selection method.

The 20D's focusing system, which includes a new nine-point CMOS focus sensor with an optimized sensor point layout, is more advanced than the 10D's, for faster and more accurate focusing, particularly in low-light situations.

There are multiple metering modes available. I had some problems, initially, with the exposure meter. Exposures tended to be off, either over or under a half stop or so. That's well within the correctable range, but it was still a problem. I played with the different types of metering and found center-weighted averaging worked best for the type of shooting I was doing.

Even in that mode, though, it took several shooting sessions for the percentage of usable images, images that were correctly exposed, to reach the level I was able to obtain with my own digital cameras. The only thing I could determine as the cause is that the camera assigns more weight to the center portion of the frame than some other cameras. Because of that, slight shifts in the composi-

tion would have a more significant impact on exposure, sometimes throwing it off.

The color LCD on the back of the camera is very viewable, as long as it isn't in direct sunlight. Multiple information options are available for display, including an RGB histogram.

The 20D's menu structure is one of the most logical ones I've seen. The menu is one continuous list broken into three sections. Selections can be made by scrolling through the entire list, or by jumping to the top of each category, similar to how individual menus would be accessed.

While, generally, the camera will feel familiar to Canon shooters, there's a new Multi-controller navigation button on the back of the camera that acts like a mini-joy-stick. It can be used for numerous adjustments, including to set things like the AF point selection, playback scroll during enlarged playback and setting white balance compensation.

The camera comes equipped with a pop-up flash. Its enhanced intelligent E-TTL II algorithm is the same one used in the Mark II, for highly accurate flash exposures. The maximum flash synchronization is 1/250 second.

Digital cameras are power hogs, but the 20D has remarkably good power management. I was able to fire away all day, well over 400 frames, with one charge. The BG-E2 battery grip, which doubles the power and adds a vertical grip shutter release, is available as an option.

Images are stored on CompactFlash cards. FAT32 formatting is supported, making it possible to use CompactFlash cards that are larger than 2GB. Images can be transferred to computer via high speed USB 2.0. It's the first Canon DSLR that supports USB 2.0, making the data transfer rate 11 times faster than with the EOS 10D. For output, it supports PictBridge, CP Direct, and Bubble Jet Direct direct-printing protocols.

Bundled software includes Canon's new Digital Photo Professional, the EOS Viewer Utility and Adobe Photoshop Elements.

While it is an entry-level digital SLR, the Canon EOS 20D is certainly functional and versatile enough to meet the shooting needs of many professionals. □