The Road to Digitization at the YCBA

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Over the past decade the Rights & Reproductions department has begun the slow transition from film (5x7 Color Transparencies) to digital. 1990’s digitization was begun scanning film. In 2001-2002, film was supplemented by adding digital captures on an evolving range of camera: Olympus E20, Nikon D100, Canon 5D. In late 2007 the decision was made to drop film entirely and go completely digital.
Going to digital comes with a bit of a learning curve. With each step we learned a little bit more and got a little bit better. By 2007, Richard (Caspole) and Melissa (Fournier) had developed a good background of digital. We did not do this alone. Consulting with other reproduction studios who already completed the transition, such as the YUAG, gave us great guidance. We were a little late to make the final switch, but holding off gave us the advantage of learning from others who already did a lot of the hard work.
After a bit of preliminary research we were able to come up with a list of needs.

List of Needs

- High Resolution
- Accurate Color
- Flexible
- Speed
- Ease of use
We wanted a very high resolution to provide for publication, and scholarly use. Ideally we did not want to have to reshoot an object over and over because we did not capture enough detail.

Of course with resolution the first thought is Megapixels, however if you have 100 blurry megapixels, it’s not very useful.

Several factors come into play in terms of per-pixel sharpness:
Most 35mm DSLR cameras and practically all point-and shoots have an AA filter to prevent Moire, but this has the detrimental affect of blurring the image.
Nearly all still digital cameras have a Bayer filter that captures a checkerboard pattern of RGB, this means some interpolation is used to fill in the blanks. Scan-Backs capture RGB on every pixel and are therefore much sharper.
The best sensor/camera in the world is not going to get a sharp image with a bad lens.
Our requirements for color were pretty straightforward:

We wanted 16-bit per Channel RGB color out for maximum detail and adjustment (if needed)

We wanted to be able to get out relatively linear data so we can profile it for accurate reproduction. If the camera tries to make an image look “good” by tweaking what it thinks are skintones, grass, sky, it will be difficult to profile.

Accurate Color

Two Requirements:

1. 16 bit / Channel RGB Color

2. Don’t mess with the color! (let me do it!)
As Melissa noted in her presentation, Richard is a do-it-all photographer. While our primary use is flat art reproduction, we needed something that could also be used for sculpture, architecture, exhibition installations, and on the rare occasion, even some portraiture. Last week Richard was asked to help with some product photography for our gift shop.
While we strive to produce the best quality possible, we have a relatively small staff and a fairly large collection that we needed to digitize. While a scan back may be able to produce an image with much more detail, 10 or 15 minute exposures would significantly reduce our production. Another concern with long exposures, is for some objects there may be conservation concerns leaving them under bright lights for a length of time.

Related to speed and through-put, we also were interested in anything that sped our workflow. We had looked at a Phase One back on a view camera, and while it offered options such as tilt-shift and very sharp lenses, it came with the problem of having to center the standards, and possibly having to do white field captures to deal with color shifts. Features like AutoFocus and Live View factored into the decision as they can aid in setup.
It does not have to be so simple that any person of the streets could walk in and do our job. Richard has been working in photography here at Yale for 30 years, he knows what he’s doing. But if the camera or software makes things harder than it has to be, it increases the chances of mistakes and generally slows down the process. Also going back to the flexibility issue, because of the need to also capture exhibition installations we needed something that was fairly portable and could be ready to go on short notice.
We chose the Hasselblad H3D-II 39 MS feeling it was a good compromise between speed and quality. We paired this camera with Broncolor strobe lighting. It has a 39 megapixel sensor, with no Anti-Aliasing filter. Some other features that we’ve found are useful is it has Auto Focus, Live View, and FireWire 800. While the back is removable, the back and the cameras are always sold as a matched pair. Hasselblad claims that make sure the back and camera are matched to meet tighter tolerances to reduce focus and colorshift issues. It also has one trick up it’s sleeve, Multi-Shot.
Multi-Shot
The camera functions like a normal DSLR in single-shot mode, it has a battery and a Compact Flash card slot for hand-held operation. However, it can set to take a 4 shot exposure, where it shifts the sensor one pixel between each shot, producing an image where it capture each color on each pixel, requiring no interpolation and producing a sharper image. Of course this only works for still subjects, and must be done on a tripod, but that works perfectly for our application.
A few years ago Hasselblad made a switch from their old Flexcolor software, which was originally made to operate their scanners. It was functional but definitely dated. This is the current Phocus interface. It has taken the “LightRoom” approach. There are a lot of tabs. It’s a little overwhelming at first, but it’s very adjustable, you can make the tabs have only the settings you need to deal with and hide the others. There are some other minor nuances that take some getting used to such as progress bars have mostly been done away with for background processing and little icons in the corners. This sometimes leads us to zooming in on something using the magnifying glass to check focus and thinking it is horribly out of focus only for it to “snap” into focus a few seconds latter, because it was processing and we didn’t notice the progress icon. This is our basic set up for our workflow in the studio.

One nice thing about Hasselblad is you can open the 3FR RAW files directly into Adobe Camera RAW. We do not use this for our studio workflow, but it makes Richard’s life easier when working on Exhibition and Architecture shots, being able to open them with just Photoshop CS5.
Live View has a lot of promise, it could help in framing or focusing when the camera is high up on the copy stand and we can’t reach it. Unfortunately in practice, it is not nearly as useful. It takes a little time to start up, and then it refreshes the frame every 1.3 seconds, and it’s a little erratic. This makes it

You start seeing noise at 100-200 ISO, 400 isn’t pretty, 800 is ugly. This is not a big problem as it is not the main use of our camera. And for the rare occasions where we need even or action shots Richard will more likely grab the D100 or 5D.

The cost is the biggest hurdle, the camera is not cheap. Neither is anything else with the name Hasselblad. Any accessories have added costs because of the Hasselblad name. Even a lens cap.

Phocus isn’t perfect, there’s still some quirkiness to it. There are updates every few months that address some of these.

Being locked into the Hasselblad body means you’re locked into Hasselblad lenses. They are not bad lenses, but the selection is limited.

Metadata is a personal pet peeve. Image on the left is the amount of EXIF data from a $200 point and shoot camera, the right shows the data that comes from the Hasselblad. There are things I’d like to see in metadata, like the serial number and more lens information (focusing distance for magnification calculations.)
This past summer we expanded our digitization effort. We added Anna Magliaro as a 2nd digital tech. And we got Bernie Staggers as a 2nd photographer to speed up our work on our massive prints and drawing collection. A 2nd photographer means we needed a 2nd camera. We really love the Multi Shot feature so we stuck with Hasselblad. The 39 MP has been discontinued, so we ended up upgrading to the H4D-50MS. A 50 Megapixel camera with multi-shot. It also has a slightly improved auto focus, but other than that the two are nearly identical.