


The Digital Reformation

changing the world for Jesus through technology

High Def @ NCC

High Definition, How To's

May 10th, 2

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In these couple of posts I'm going to go over how we do HD video at NCC. I'll try and keep it technical enough to satisfy you tech geeks out there and non-technical enough so the rest of us can understand it. I'll also use lots of links to product pages and wikipedia, a great resource for learning some of the technical stuff. Feel free to post any questions or suggestions in the comme



It all starts with the camera. We use a Canon XLH1 mounted on the ceiling at Ebenezer's. The mounting does involve a level of adjustment so we can re-aim the camera for different speakers. Unfortunately, we currently can't do any camera movements during service and only have the one camera that we use for the video message. The camera has a HD-SDI output that sends out uncompressed HD signal that we run up into Pastor Dave's office. We'll probably never use the tape heads in the camera as we get such a high quality signal from the SDI out.



In his office he has a beast of a machine. PD uses a quad 2.5 GHz processors Mac G5 with 8Gig of memory. (It's where all our HD editing and rendering is done.) His main monitor is a 30in cinema display and he has a Toshiba 27in LCD TV that is connected as a secondary display on which we can preview the shot. We are able to evaluate the camera shot from PD's office before service so we can adjust the camera shot, light levels, white balance and get a pretty good idea of what the shot looks like.

We use a Blackmagic HD PCIe card, the DeckLink HD Pro PCIe, that has an SDI in and allows us to capture full uncompressed 10bit 1080i with 4:2:2 chroma sampling. Using Final Cut Pro HD we capture the sermon as it is preached. For audio there is also a mix from the soundboard that goes up to PD's office. He has a mini board there that he can use to adjust levels before the sound goes into the line-in input on the Mac.

After capture of the video post-production begins. We'll cut what we've captured to include just the sermon (trimming things from the beginning and end), add some fades, and splice in any video clips that happen during the message. (This way when the video played on Sunday it can run straight through without having to worry about the clips.) We'll also do any color correction we might think is necessary, although we try and avoid this by getting a good white balance as it takes a bit of time to render 40 minutes of HD video, not something we want to do on a Saturday night. And then we add the audio track. Now, the audio is a little tricky as we've discovered that there's a small delay in the playback of video compared to audio during service. So we have to move the audio about 5-7 frames back in the timeline so that when played on Sunday morning it all matches up. After we're all done with this we export to a quicktime movie format.

National Community Church, High Definition, HD, Cannon XL-H1, DVCPRO HD, Decklink Pro HD, Apple, G5 Quad

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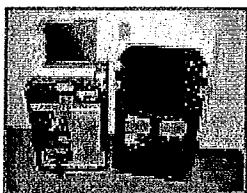
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After having our sermon as a HD video file we then export it to our hard drives that go to each of our locations for Sunday Mornir We use LaCie external hard drives with 120GB of storage. These drives contain all of our video files we use and all of the song fil we use during worship. We use ProPresenter to run our services and are able to run it right off the external drive. The program allows us to play our videos by just clicking on a thumbnail and they play directly off the external hard drive. (I'll get into our equipment in a second.) We also use ProPresenter for all of our song lyrics as well, so all of our video needs are integrated into c program on one machine.

As for the machines: Each location has a dual 2.0GHz processors Mac G5 with 1Gig of memory. They all also have the Blackmagic card, the DeckLink HD Pro PCIe. These cards have a component output (Y, Pb, Pr) that we run up to our projector. The external hard drives are connected via Firewire 800 (IEEE 1394b). This is the new firewire protocol which supports data transfer rates of t to 3.2Gbit/s. I'm sure that we're not going that fast but we are able to run ProPresenter and our videos right off the hard drives

The audio is a little complicated. The audio comes through the Blackmagic card, but the card only has digital (SPDIF/AES) sound output. This would be great if we were running a 5.1 or 7.1 surround system, but right now we're not and our sound board does i have a digital input. So we had to get a D/A audio converter that converts our digital signal to analog and allows us to use plain i left and right RCA cables to connect to the sound board. At the theaters we use RME ADI-2, a Hi-Performance 192 kHz/24 Bit 2-channel AD/DA-converter.



These Macs are all housed in individual units that allow for easy portability, set up, and tear down. The G5's are all rack mounte along with the D/A audio converter. We have the screen, keyboard, mouse, and the cables for the hard drive (power and firewir 800) on a little platform on top. We placed BNC component plugs on the side of the unit along with RCA connectors. So basically we have to do in the morning is plug in the power cable, the video cable, sound cable, and the hard drive and we're good to go.

As for projectors, at our Ballston theaters location we have a Christie LX-45 that we fitted with a long throw lens and put in the projection booth in the morning. It has a native resolution of 1024x768 and accepts HD signals. At the Union Station theaters we use Panasonic PT-6600UL projectors. These projectors have a native resolution of 1366x1024 and also accept HD signals. We're looking to upgrade to true 1080i projectors sometime in the future.

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1. Nathan Jones Says:

October 2nd, 2006 at 10:29 am

I stumbled upon your blog while reading about the NCC website (congrats, BTW!) and wanted to thank you for posting about

the details of NCC's high def equipment.

I've really been wondering how you do as much as you do with a semi-portable church layout. The webcast looks great and am looking forward to whatever next steps you take.

2. **New Movie Reviews Says:**

August 26th, 2007 at 7:42 pm

New Movie Reviews...

I couldn't understand some parts of this article, but it sounds interesting...