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Article Focus:

Rick Gerard takes a close look at Premiere Pro 1.5 as a viable professional HD editing solution.

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Adobe changed more than the face of Premiere when Premiere® Pro was introduced. They completely rewrote the program from the ground up concentrating on the performance benefits of Window XP®. Many criticized the decision not to support the Mac, while others thought and hoped that Adobe would build, at least, an NLE that was as capable as Final Cut® for it's PC user base. Premiere Pro 1.0 brought this NLE much closer to a "professional" level than it had ever been before. With the release of Premiere Pro 1.5® they have improved the product to the extent that it may well be a reasonable solution for many professionals working with SD and HD video.

Rick's HD primer:

So, what the heck does HD mean anyway? Let's start by defining SD. SD - standard definition - is anything with a resolution up to PAL with 576 lines and 720 samples per line. Anything with a resolution higher than 576 lines is then, by definition, HD. Generally the HD frame is either

| Frame Size | Type | Mbps | GiB per hour |
|------------|-------|------|--------------|
| 720 X 480 | DV 25 | 25 | 11 |
| 720 X 480 | DV 50 | 50 | 22 |

1280 pixels (samples) by 720 lines, which is commonly called 720, or 1920 pixels by 1080 lines, typically called 1080. The biggest problem you run into when working with these higher resolutions is data rate. The chart at the right lists data rates for several common HD formats. The chart is accurate for the color sample type displayed. It is easy to see that without some kind of compression scheme coupled with a very fast storage solution just playing back 1080i is going to take more capacity than today's storage and desktop systems can provide.

| | | | |
|-------------|--------------------------|------|-----|
| 1280 X 720 | 8-bit 4:2:2 | 168 | 74 |
| 1280 X 720 | 10-bit 4:2:2 | 210 | 92 |
| 1280 X 720 | HDV 720 30P | 19.2 | 8 |
| 1920 X 1080 | 8-bit 4:2:2 24 fps | 795 | 350 |
| 1920 X 1080 | 10-bit 4:2:2 24 fps | 994 | 437 |
| 1920 X 1080 | 8-bit 4:2:2 30 i fps | 994 | 437 |
| 1920 X 1080 | 10-bit 4:2:2 30 i fps | 1243 | 546 |

How is it done?

The first requirement is some kind of capture solution that will provide both hardware acceleration of video processing and some kind of compression. The current list of working HD capture solutions for Windows® systems is a short one. Blurplefish 444, BlackMagic Design, Canopus, and Matrox are working on solutions. The only Premiere Pro system I saw at NAB that you could actually buy today that would handle 1080i easily is the 1-Beyond HD-Pro™. 1-Beyond's editor uses the Bluefish 444 card. [More on this amazing editing system later](#). Even though the capture cards advertise themselves as uncompressed, there is some lossless compression and some color space manipulation going on that reduces the data rate to manageable proportions.

This brings us to the second hurdle that must be overcome - storage. The only way to achieve the required sustained data transfer rates is to combine multiple high speed drives into a single storage volume and then send all that data down a very high speed pipe to the rest of the computer. This is typically accomplished with a RAID (Redundant Array of Independent Disks) and a controller card. RAID 0 is the fastest, but offers no protection or redundancy for your data, RAID 3 uses 3 or more drives to provide fault tolerance and is the system of choice for most people working with HD. There's a performance hit over RAID 0 but several companies have come up with hybrid controller solutions that improve the total throughput to over MB/s.

The third hurdle you must overcome is sheer processing power. The current generation of Intel and AMD processors have raised the performance of average desktop machines to levels undreamed of just a few years ago. Still, if you want to work with 1080 HD footage you must have a machine with a CPU running at near 3 Ghz.

If you build it, will it work?

Let's assume that you put together your dream system. Whether it's one of Alienware's new professional workstations with dual Xeon® processors, or a spanking new conglomeration you put together from parts, you still have a few hurdles to overcome. The first hurdle is finding the right capture card, driver, display adaptor, machine control, memory, audio, controller card, RAID and every other possible combination that will work with the software. Premiere Pro 1.5, and even 1.0 works very well with OHCI 1394 cards and DV material. I won't get deep into the features of the Premiere Pro in this article. There are hundreds of thousands of different hardware combinations for a PC and just one funky driver can screw up the whole system. This is one place where Apple will probably always have the advantage. There are just not as many ways to get into trouble. If it were me, I wouldn't consider building my own system from scratch. The debugging alone could take months. I'd look to a company that provides a turnkey solution. That's what I'll take a look at next.

1 Beyond HD Pro Workstation

If all NLE's worked as well as this Mylanta wouldn't sell any more tablets to editors. The 1 Beyond HD Pro uses the latest PC technology in the internal structure to speed up data throughput. It uses the wide 64 bit fast PCI-X bus and unlike consumer computers that have one PCI bus, it has three separate PCI buses. This avoids the limitations of even the fastest PCI-X buses from becoming the data path bottle neck. The first part of the HD solutions seems to be beautifully solved.



The second part of the problem is addressed by the 1 Beyond HotRock™ storage system. HotRock storage has a separate bus for each disk. This eliminates the bus traffic problem and combined with the fast and separate PCI buses. HotRock yields over 400 MB/s of sustained data rate. Roughly twice the sustained data rate of traditional SCSI disks. The second problem is solved.

Third Problem: Capture solution. The current version of 1 Beyond HD Pro uses the BlueFish 444 line of capture cards. They are also working with BlackMagic Design to incorporate their card into their product line. 1Beyond has worked closely with BlurFish444 clearing out problems integrating the capture card with the other hardware in the system. Problem three - solved!



As a final note - take a look at this amazing double wide case. I was more than a little impressed with the way that 1Beyond has designed this box and the drive enclosures. At the bottom of the case there are 8 removable drives for archiving and backup. The top of the case contains 20 swappable drives that make up the HotRock storage array. I've never seen any editing solution that is this clean and self contained.

The box is also amazingly quiet and will operate as far as 64 feet away from the monitors and keyboards to provide a truly silent editing environment.

So, the hardware impressed me. It's time to see if Premiere Pro is up to the task of editing HD in a real world production environment.

Roughing up the contender.

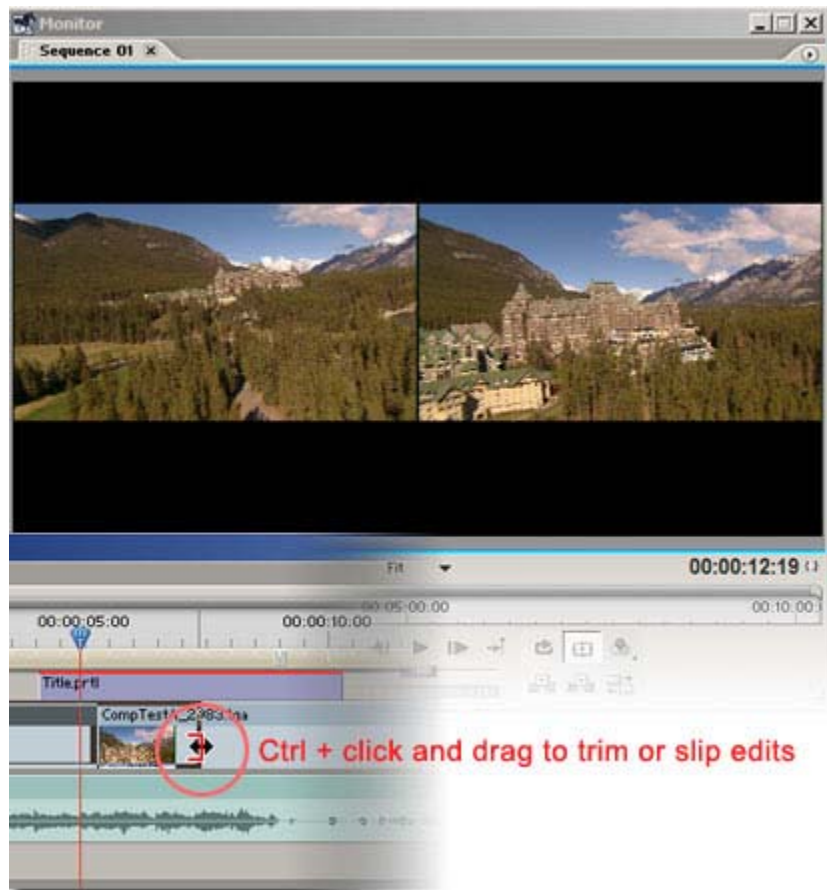
There are a few things that I routinely do when evaluating the stability of an NLE. After I drag a few clips into the timeline I grab the CTI (Current Time Indicator) and drag it around the timeline as fast as I can for about 15 or 20 seconds. I'm looking for both lag and hang up problems. This is usually the first indication of instability. With the 1Beyond HD Pro workstation I found no problems. The second test I do is use the JKL keys to check for system lag. Press L once - HD footage plays at normal speed. Press twice - 2X normal. Press again and again until the system is playing at 10X normal speed then press the K key to stop

playback. Running through this drill several times I found no lag at all, The system responded much better than expected. Premiere Pro was stable as a rock and the hardware was keeping up with my abuse. It was easy to conclude that I could cut as fast as I could think using this system.

It's time to make some edits and do some polishing. One of the great timesaving features of Premiere Pro is the ability to use modifier keys to simplify editing in the timeline. One of my favorites is using the Ctrl key and the direct selection tool to trim, slide, and or slip both edits and transitions directly in the TLW.

Top 10 New Features

- Project Manager. Greatly improved media management.
- Panasonic 24p support.
- Effects Favorites. Save favorite settings for quick application in future projects.
- Project-ready Photoshop file creation. Create Photoshop files with resolution and aspect ratio that match your project.
- After Effects plug-ins automatically appear in your Premiere Pro session.
- Copy and paste content directly between After Effects and Premiere Pro .
- Auto-color adjustment.
- AAF, and EDL import/export.
- Enhanced audio functionality.
- Bezier keyframe support for motion effects.



There are dozens of new keyboard shortcuts for Premiere Pro and dozens of new tools. As many as I checked out worked perfectly. The 1 Beyond HD Pro workstation just worked. In the few minutes I had with the system, everything worked as it should. Apparently, I'm not the only one that thinks so. Cable Vision has 5 workstations cutting HD content from one of 1 Beyond's SAN storage arrays and according to company founder Terry Cullen, they are very happy.

Some final thoughts:

I'll be writing more about Premiere Pro 1.5 in the near future. For now, it's sufficient to say that I find editing in Premiere Pro 1.5 an easy task. The software does not get in the way of the creative process. Everything

is easy to find and there are plenty of tools for a professional editor. Project management is greatly improved. Audio mixing and editing down to the sample level is extremely powerful. The ability to burn DVD's complete with chapter marks directly from the timeline is a nice plus. Integration with the rest of Adobe's line is getting better all the time. Even on hour long programs, I'm finding no slowdown, no bottle necks, no problems with DV and SD material that I'm currently cutting. Integrated systems like the 1 Beyond HD Pro workstation prove to me that even with the demands of 1080 HD footage, Adobe Premiere Pro 1.5 is equal to the task. I'm looking forward to more research into HD editing and to cutting my first full length HD show. My tool of choice on the PC will be Adobe's Premiere Pro 1.5.