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## Simplay HD™ Program News

We're glad to report that many major manufacturers have joined the program since our last newsletter, and will now be sending in their products for testing and verification. A big Simplay Labs welcome to Microsoft, HP, Bose, Acoustic Research, Hitachi, JVC, Panasonic TV, and TTL.

We've been busy testing products, and have verified nearly 100 devices at this point. So why aren't they all listed on our web site? Well in many cases, these products aren't on the market yet, and we don't want to tip the hands of our testing partners. More and more manufacturers are getting smarter, and testing earlier in the process, so they can be confident that their products will work right from the first unit shipped.

We've now opened a Simplay test center in Shanghai, our second testing center in Asia (the other is in Shenzhen). We've also been putting a lot of effort into getting the new London facility up and running, to provide our European manufacturers with a local testing option. As you can imagine, the Simplay Labs staff has been racking up a lot of frequent flyer miles (not to mention jet lag hours), but hey, we're on a mission here: to make sure that HD gear works, all the time, in every time zone.

Speaking of the travel calendar, the Simplay HD team will be conducting two training sessions, compliments of Acoustic Research, at the upcoming [CEDIA](#) Expo in Denver on September 14<sup>th</sup>. The course is titled "Get Ready for HDMI," and attendees will be awarded .375 CEDIA continuing education units. The first session will run from 2-3:30pm; the second from 4-5:30pm. Both will be held in Room BR5C at the Denver Convention Center. Come find out what's behind some of the common problems with A/V installations, which products have passed our testing program, and what you should look for when buying or recommending HDMI products.

## Notes from the Test Bench

The Big Buzz around the Lab is the recent release of the HDMI 1.3 specification, which includes some major enhancements over previous versions. We believe there are some big implications here for the future of A/V technology - which is why Dr. HD has devoted his column to the subject (see below). Of course it also means a vigorous overhaul of our testing protocols, so we can evaluate the newly enabled features and functionality as they come to be implemented by manufacturers. As always, we will go

beyond the minimum testing standards for basic HDMI compliance and test for real-world performance under less than ideal conditions.

That extra-mile approach to testing can already be seen today in two important, overlapping areas: cable testing and 1080p performance testing. Simply put, HDMI compliance testing does not address the increased performance requirements for a 1080p connection, whereas Simplay HD testing does. Our testing regimen pushes cables and components to the edge of the current performance envelope - up to 150MHz of bandwidth - and includes testing with less-than-pristine signals, to simulate the real world challenges of long cables runs and other complicating factors that A/V consumers and installers face every day in the field.

When you have a source that can output 1080p signals, (like that PS3 we've all been waiting for) you need to ensure that your HDMI cable is up to the task. Sending data out at twice the speed of a 1080i or 720p source means that there's less room for error, and a high quality cable is needed. That's why Simplay tests cables up to the 1080p limit. In our many training sessions, we've heard customers ask "Won't the source connection automatically downshift to a lower speed if the cable's not good enough?" - the answer is an emphatic "NO" - you'll get a blank screen, scratch your head, and wonder what's broken this time - a scenario that Simplay certification is specifically intended to prevent.

Now HDMI testing is great for what it does, and certainly better than the all-too-common alternative, which is no compliance testing at all (i.e. FireWire). The point here is that Simplay HD testing goes a lot further, and covers more bases. So if you're looking for a "gold standard" of testing for CE equipment, you can stop looking now. Simplay HD is it!

## Dr. HD on HDMI 1.3

*Q: The latest version of HDMI (v1.3) supports many features that older versions do not. How important is it to get the latest/greatest HDMI version, and is there any easy way to tell which version is used in a device?*

A: Before you go wading through a sea of product data sheets, let me save you the trouble. From a buying point of view, knowing the HDMI version has no real value. HDMI 1.3 is not a feature, or even a set of features, but rather a framework that allows manufacturers to design and build certain features. The specification stays ahead of the product curve intentionally, and features that were enabled in theory by earlier versions are just now coming to market. For instance, the EZ-Sync functionality in Panasonic's new DVD player and HDTV line, which exploits the expanded CEC (Consumer Electronic Control) capabilities introduced in HDMI 1.2. So shop for the features you want, and forget about the version number.

That being said, there's still a whole lot to say about HDMI 1.3, and what it portends for the future of consumer electronics. If you're curious to know what A/V gear is going to be like a few years down the road, examining the new capabilities in HDMI 1.3 is a great place to start. Some of them may sound like science fiction today, but we all

know how quickly things can change, and how fast the “out there” features can turn into “must haves.”

The first and most obvious change to the spec is that there's more available bandwidth in 1.3. Thanks to incremental improvements in the TMDS coding algorithm (transition minimized differential signaling, for the acronym-averse), that same shielded, twisted-pair based HDMI cable is now capable of hauling a lot more data than it used to. And when I say a lot more, I mean a lot more. The single-link speed is up to 340MHz, with plans to expand to even higher speeds in the future. That means there's a whopping 10 gigabits per second available now.

Why is this important? One of HDMI's big advantages over FireWire and other legacy connections has always been that it has enough bandwidth to send HD signals without compression. Once a digital signal has been “unpacked” by a set-top box, disc player, or other source device, it stays that way until it reaches the display, avoiding the inevitable losses in quality that come from repeated compression and decompression. Along with better signal fidelity, eliminating the need for compression has other advantages. It means that A/V components can be built for less, since they don't have to perform this type of processing. And in the future, when your content provider switches to a different compression scheme (i.e. MPEG-4), the only piece of equipment you'll need to upgrade will be the set-top box. While earlier versions of HDMI had plenty of bandwidth for uncompressed transmission of video up to 1080p/60, the new spec allows that ceiling to be raised substantially. Future devices will be able to transmit even fatter signals, 1080p/120 and beyond, with the same end-to-end quality that we enjoy today. It may be a while before home theater applications demand that level of performance, but makers of gaming consoles will be able to put that extra bandwidth to good use immediately. Of course the PC world is already familiar with this kind of display speed; the gain for HDMI makes it the clear leader as a crossover interface between A/V and PC applications. Media Center PCs, for instance, are likely to rely increasingly on HDMI rather than traditional PC interconnects.

Increased bandwidth is not a feature in itself, but it enables product designers to improve the CE experience in a number of evolutionary ways. Along with higher resolutions (1440p, anyone?) and refresh rates of 120 frames per second or better, it allows a radical rethinking of the way we look at color. That's the second big change in HDMI 1.3, and the one that may actually offer the biggest potential in the long run: a revolutionary expansion of the available color palette. While today's equipment typically maxes out at a 24-bit color depth, HDMI 1.3 supports up to 48-bit “deep color.” That's not just twice the color detail; it's 4,000 times as much, a quantum leap from millions of colors to trillions. With that kind of color depth you can say goodbye (and good riddance) to color banding, the annoying tendency of fixed pixel displays to break down what should be smooth color gradients into discrete bands or stripes of color. But just as important as increased color depth, the new spec also offers the potential to widen the color spectrum, and allow content creators to use colors that have historically been out of bounds for display on a TV monitor. In addition to being more richly nuanced, colors can now go past the limits traditionally imposed by the broadcast environment, offering shades that are literally off the map. To get an idea what a wider color gamut might look like, consider a Technicolor film as it appears in a movie theater, compared to what it looks like on your TV. No matter how good your equipment is, there are some colors that just don't translate because they are outside the bounds of the color model, and are summarily clipped down to fit. HDMI 1.3 affords product designers a historic opportunity to break free of these

old-tech limits, and deliver colors that have never before been seen on a TV set, or for that matter, in nature. To take full advantage of these expanded capabilities, HDMI allows pixel data to be defined under the new xvYCC color standard, which broadens the boundaries of each color to span nearly twice its conventional width. Like 120Hz frame rates, deep color is something that will probably be of more immediate benefit to gamers than to movie buffs, but eventually we may look back at all of today's source material and be amazed that we ever put up with such washed out, half-baked colors.

HDMI has always had plenty of bandwidth to spare for digital audio, thanks to the clever way TMDS packs audio data into unused space in the three video channels. From its inception, HDMI has allowed the uncompressed transmission of eight-channel, 24-bit, 192 MHz digital audio, more than enough sound data for any of the currently available media formats. But just as digital video is evolving to exceed its historic limits, so is surround audio. HDMI 1.3 addresses this evolution by including support for the two new "lossless" audio codecs, Dolby® TrueHD and DTS-HD Master Audio™. These new formats are part of the HD-DVD and Blu-ray standards, and combine the bandwidth advantages of audio compression with the perfect fidelity of uncompressed audio, allowing content creators to deliver richer audio detail without any widening of the audio footprint. This means that we can experience the same quality of surround audio that the movie was originally mastered with for the theater release.

With the growing complexity of A/V systems, and the increased use of digital signal processing in devices, synchronization of audio and video outputs is becoming more of a challenge. The 1.3 spec addresses this issue by introducing a new "lip sync" function, designed to compensate for the inherent processing delays in various components, and get the words and the pictures to all march in step. Devices which have this lip sync capability will automatically perform the corrections to just the right amount without user intervention. And of course users can mix and match because these features are optional and HDMI devices will still function fine if the option is not supported by all the devices.

Finally, even though the standard HDMI plug is reasonably small, the new spec introduces support for an optional, miniature connector called the Type C connector. With HDMI ports already showing up on portable devices like digital cameras and camcorders, this is a natural evolution of the technology. As with USB, product designers will now have two plug forms to choose from. And with HDMI's bandwidth advantage, it seems only natural that these mini-connectors will start to show up on a wide variety of handheld and portable devices that currently rely on analog connectors, USB or FireWire.

So that's what the future looks like, using the expanded capabilities of HDMI 1.3 as our crystal ball: faster, smoother, and more colorful, with better sound and more ways to connect. Dr. HD says "Make it so!"



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