

D2



“ ... A STAND-OUT ... the next generation of performance in video processing.”



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INTRODUCTION

There have been very few source components in my home theater that have stayed there a long time. Being a writer in this industry has its perks, especially getting to play with lots of new stuff, but it also has its drawbacks. The biggest drawback is having to keep everything at the state-of-the-art. Home Theater technology changes all the time, and it is up to me to stay current and explore the differences. So, most of my DVD players, receivers, video processors, and surround sound processors get changed out as the technology is improved upon. But one component has remained in my reference system for quite some time now, and looks to be safe in the rack for a long time to come, the Anthem Statement D1/D2.

I was one of the first people to own the Anthem Statement D1 that Brian Florian lovingly praised in a review here at Secrets. I could go on and on about how much I've enjoyed this surround sound processor in my system, but I saw its day eventually coming to an end as HDMI became more prevalent and high definition audio formats appeared on the horizon to be released as part of movies on HD DVD and Blu-ray discs.

Only a little while after the D1 hit the market, I met up with Anthem at a Home Theater convention and they commented that they were working on an upgrade to the D1 that would include HDMI switching with support for the HDMI 1.1 spec and some type of video processing. This upgrade would be a hardware addition to existing D1s, or consumers

could just buy a D1 with the upgrade already installed. They even mentioned adding support for iLink (Firewire) for digital transmission of all available sound formats, including DVD-Audio and SACD. Ultimately, they did not include the iLink support with the final product based on the perceived needs of the market and lackluster support of high-resolution audio in the audio marketplace.

What Anthem did bring to the market outshined what I thought the D1 upgrade would actually include. Video processing is now appearing in SSPs, but is more common in most high-end A/V receivers. Denon, Pioneer, and Yamaha have been offering this for some time now, with products even featuring de-interlacing and scaling from Faroudja. The problem is this support has been limited to processing

for standard definition (SD) sources only, like DVD, and the output resolutions have been limited to the standard 480p, 720p, and 1080i resolutions. While this does take care of a lot of displays out there, there are more and more requiring slightly different resolutions like 853x480 (ED plasma), 1024x1024 (ALIS displays), 1366x768 (LCD), and more. With all of the new display technologies coming on board, it seems like the need for even more flexibility is necessary.

“... better than the vast majority of video processors I’ve ever evaluated ... not just a simple de-interlacing and scaling solution — a full video processing solution ...”

THE BEGINNING

Originally, Anthem had designed the concept of their video processing board around an already popular video processing solution, the Genesis FLI-2310. This chip has become very common in DVD players, displays, and A/V receivers, and its price point makes it a very attractive solution for the market. It uses Faroudja’s proprietary algorithms, including their patented DCDi for diagonal line processing of video based material.

“The fact that it does true HD video processing makes it a standout ... Couple this with the HDMI switching and the fact that it supports all the audio formats that will soon become the new standard with HD-DVD and Blu-ray and you have an investment that will pay off for a long time ...”

During the trade show where I spoke with Anthem about it, they mentioned the FLI2310 and alarms started going off in my head immediately. As much as I like the Faroudja solution from a de-interlacing perspective, the chipset has some very serious issues that have been reported here at *Secrets* back when it first came on the market. The biggest concern is enhanced macro-blocking in darker areas of the image. This manifests as blocks of noise that can vary in severity from

subtle to unwatchable depending on the end users display. I have literally seen some displays not show the problem at all and others show it so bad that you would never want to watch it. I immediately warned them about this problem and listed the displays I’ve seen the issue on and informed them about material that was good for testing for the bug.

Sure enough, sometime later, Anthem decided to go a different route. After doing a lot of research in the market on new video processing solutions that were appearing, they chose the new Gennum VXP video-processing chip. The VXP chip is a one-chip high-definition video processing solution that includes full inverse telecine and motion adaptive support for 1080i. It is one of only a small few that can perform these tasks, making the Anthem video processor one of the very few out there capable of de-interlacing a 1080i image properly. They also decided to rename this new processor the Anthem Statement D2 rather than just the D2.

FINAL DESIGN

The final product for the D2 added HDMI support in terms of four HDMI inputs and one HDMI output. The inputs support most of the HDMI version 1.1 specification, including support for PCM 96/24 stereo soundtracks, six-channel PCM 96/24 soundtracks, and the full complement of Dolby Digital and DTS soundtracks. (High Resolution PCM soundtracks like those found on DVD-Audio require a DVD player that also conforms to the HDMI v1.1 specification if you use HDMI for transmission.) It also included full video conversion of S-Video and component video to HDMI, along with Anthem’s own on-screen menus. All input resolutions from 480i to 1080p can be output at various resolutions up to and including 1080p at different frame rates. The component video output can output resolutions up to 1080p (pass-through) or 1080i (processed) as long as the source component software isn’t copy protected (at this time, most DVDs are).

“... an incredible job ... these chips have taken video processing and cadence-based de-interlacing to the next level ... top of the line de-interlacing performance.”



Currently, the D2's input EDID information relays that it can support up to 96/24 for input audio resolution. It also does all of its post-processing (bass management, time alignment, PL-IIx, THX, etc.) at that level then up-samples to 192/24.

For this review, I received a final version of the actual Statement D2 as opposed to having my D1 upgraded to a D2. Right now, Anthem is pretty much backlogged with orders for the D2, so upgrades on existing D1s have not started yet. I plan on having this done at the first opportunity and will follow-up this review if there are any differences between an upgraded D1 and a native D2 worth noting. Right now the only difference I know of is that the silk screens on the front panel will not be the same. The D2 has both the HDMI logo and the Gennum VXP logo; updated D1 processors will not have these.

SETUP

Setting up the D2 is pretty much exactly the same as the D1. All of the flexibility stays intact and all the things you could previously do with any audio or video input remain the same. When you are setting up each individual source you select which video input and audio input you want associated with it and what sound decoding you want the input to default to for each type of input signal. For example, for DVD you can select HDMI 1 for the video input but you can select any audio input whether it is analog or digital. Then you go through the surround sound modes you want for each input type. 6.0 PCM, 2.0 PCM, 2.0 surround sound flagged, Dolby Digital, Dolby Digital EX, and DTS-ES Matrix can all have different post-processing applied including THX, Dolby Pro Logic IIx and so on (DTS-ES Discrete cannot have post-processing applied to it.) All of the flexibility is still there.

With HD-DVD and Blu-ray there are new sound formats to deal with. These include Dolby Digital Plus, Dolby True HD, and DTS-HD. As it stands right now, these formats need to be decoded to high resolution PCM inside the player to take full advantage of them in your system. This means the decoded PCM stream can be transported via either HDMI or analog multi-channel outputs like we've had to do with DVD Audio and SACD in the past. Only receivers or A/V processors with HDMI v1.1 compliant inputs will be able to accept these signals via HDMI. The D2 does this and you can apply any post processing format you want to it including ones like THX Ultra 2 and PLIIx. Recently Anthem updated the D2 firmware to allow for setup of the default for up to 6 discrete channels of PCM so you can apply different processing on top of it. This allows me to take decoded Dolby Digital + 5.1 soundtracks that have been decoded to high resolution PCM and add stuff like THX Ultra 2 or Dolby Pro-Logic IIx post processing to it.

Eventually these formats will have support for decoding inside receivers and SSPs. This is rumored to happen with the introduction of the HDMI v1.3 spec (or possibly even a v2.0). I haven't spoken directly with Anthem on what their plan is for this but they have mentioned in the past that they will support any sound format that comes down the pipe and since the D2 has a completely upgradeable DSP board, I imagine they will do this when it becomes available and necessary. The only roadblock I see for this is the HDMI receiver chips in the D2. I don't think they can just be upgraded with firmware to the 1.3 spec later down the line so I am not

sure if another hardware update would be necessary. I really don't see this as much of an issue though since all of the formats can be decoded within their respective players. The SACD via HDMI. SACD uses a 1-bit encoding format called Direct Stream Digital (DSD). The HDMI 1.2 spec addressed the need for the transmission of this 1-bit data stream and all further HDMI specs will incorporate the previous features. There is a workaround for this though. DSD bitstreams are often converted to PCM in most Universal DVD players for things like bass management and time alignment. That PCM data could be passed over HDMI just like any other PCM material making digital delivery of SACD possible. Right now I know of only one player that does this, the Oppo 970HD.

"... worked without a hitch in its conversion to HDMI ... all of the resolution — was kept in tact ... image looked razor sharp ..."

In the main setup menu of the Anthem is a new selection for video output. This is where you can select the main output configuration of the D2. There are selections for output type, resolution, color space, data format, letterboxing, synch and the Component 2 output (the D2 has two component outputs).

For output types you can chose from HDMI or component video. If you select component then the selections that pertain to HDMI only will not be accessible in the output setup menu.

The next setting is the output resolution. The D2 does not allow for custom output resolutions but it does come pre-programmed with 21 different resolutions in various refresh rates (frame rates) including 24, 25, 30, 50, 54, 60, 65, 70, 75 and 85 Hz! (Refresh rates are output resolution dependent and not all rates are supported with all resolutions.) There are plans in the works to add 48 Hz soon to some existing resolutions and new resolutions can be added as necessary. During my review I used the D2 with output resolutions of 720P and 1080P both at 60 Hz.

The output color space is selectable and includes HDTV and SDTV depending on the end display and what the user prefers. You can also select Auto. Many of the displays on the market automatically use the HD color space (REC 709) when they receive a signal higher than 480P, even if the original source was mastered using an SD color space (REC 601, like most DVDs). The D2 allows you to force a color conversion or let the EDID information from the display dictate.

For data format you can chose from YCbCr 4:2:2 or 4:4:4, RGB, or Extended RGB. 4:2:2 YCbCr is the standard output of most DVD player's MPEG decoders. Some of the newer upscaling DVD players will also output 4:4:4, which enables for higher color sampling (keep in mind that DVD is mastered at 4:2:0 so the higher color sampling is essentially added information not inherent in the original source, HD DVD and Blu-ray use 4:2:0 as well). RGB is the most common color scheme on the market and is supported by all displays. Extended RGB re-maps the RGB luma levels so that black is moved from digital 16 to 0 and white is moved from digital 235 to 255. This will usually introduce banding and it also clips head and toe room in the

image. We do not recommend this setting unless you are using a display that clips head and toe room anyways, which only a few do. For this review I used the YCbCr 4:2:2 and 4:4:4 output modes as well as the RGB output with various projectors. The Gennum VXP chip does a minimum of 10 bit processing but if the HDMI output is selected for YCbCr 4:4:4 or RGB it is dithered and truncated to 8 bit. The YCbCr 4:2:2 supports the full 10 bit resolution of the VXP chip and is highly recommended for anyone using a digital display featuring an HDMI input. This will help with the common “banding” and “contouring” artifacts so typically seen with digital displays.

The output menu also lets you select the level of “gray” for pillar-boxing or letterboxing applied to the image. There is a setting for adjusting the synch of the HDMI output and for selecting the output of the second component output. Component output 2 can be set to the same processed resolution of Component 1, can be unprocessed, or be set for Zone 2 (which is unprocessed). You can also turn the second component output off if you want.

But that is just the start of the video processing setup and tweaking. You could just leave it at that but Anthem has taken full advantage of the Gennum VXP processor. For this there is a completely different setup menu that will overlay over the active onscreen image. The menu system is very clean and intuitive and is separated into five main areas: Picture, Crop Input, Scale Output, Pattern and Info. Processing like you'll find in these menus is what would normally be reserved for high-end stand-alone video processors, not surround sound processors or audio/video receivers.

GENNUM VXP

The Gennum VXP chip is not just a simple de-interlacing and scaling solution; it is a full video processing solution similar to the recently reviewed Silicon Optix Realta chip with HQV processing. In the past we've been limited to chips that do a good job with certain things but required a lot more processing for image processing beyond de-interlacing and scaling. Things like chroma upsampling error (CUE) correction, picture controls, and advanced picture controls (Y/C delay, pixel cropping, detail enhancement, noise reduction) have been absent, which is why standalone video processors have become so popular (and in our opinion necessary!). But just because a chip offers a high level of flexibility in image processing doesn't mean the companies that use them take full advantage of them. We've seen this a lot in our reviews and it's not the case here.

All of the advanced picture options in the Gennum menu are adjustable for EACH source. That means every input source can have separate tweaks applied. As I go over the features in this menu you will see why this is so important. For picture control the D2 offers a wide variety of options. Some are far more useful than others and some most people will never use at all. Most of the default settings are actually dead on and what we recommend but some of the features are worth looking at to decide whether you can use them to enhance your viewing experience. All of the settings apply equally to both SD and HD input sources.

“... the best HD viewing I've done to date ... amazing depth, clarity and colour fidelity ... the best high definition video processor we've evaluated ... Its standard definition processing is better than any SSP or receiver I've tested ...”

In the Picture menu you'll find selections for input color space, image color (contrast, brightness, saturation and hue), Film Mode (de-interlacing mode), detail enhancement, noise reduction, and motion threshold.

Input color space is a selection few will use, as most people don't know what color space their devices output in. The options include HDTV YCbCr, SDTV YCbCr, or Auto. This will force the input color space for those of you who may be scaling a SD source in a DVD player but want the processing done in the correct SD color space. The Gennum VXP does all of its video processing in the RGB domain so no matter what all input signals are converted to RGB and then converted back to the output color space selected in the output video menu I commented on earlier. I used the auto feature and never had a single issue.

Image color had the obligatory adjustments most find with any display but since the D2 handles each incoming source separately this allows for the end user to adjust for inconsistencies between each source. Since there is only one HDMI output (and since most displays only have one digital input) the need for separate picture adjustments for each source is imperative as most manufacturers just can't seem to get all on the same page, even in the digital domain. Adjustments you'll find here include Contrast, Brightness, Saturation, and Color.

You'll find controls for the Gennum's de-interlacing capabilities in the Picture menu under Film Mode and Motion Threshold. Film mode is either On or Off and we didn't find a single reason to turn this off. The Gennum does an excellent job picking up cadences and locking on. Motion Threshold sets the level of detection and its default setting did fine with all of our mainstay tests.

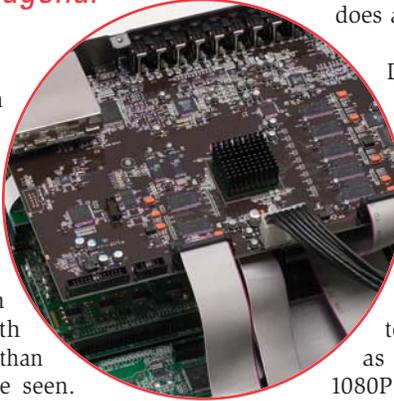
The Gennum offers some more advanced video processing similar to the Silicon Optix Realta chip including detail enhancement and noise reduction. The HQV Benchmark DVD has some excellent video clips to test these functions with so I relied on it for all my subjective testing.

The Detail Enhancement feature did a good job with the “staircase and bridge” scene on the HQV chip but the Gennum offers a LOT of range for this setting. I found that if you went too high, things got bad. Be careful what you do here. Detail chips essentially add high frequency information that is not really in the image and normally to get something you have to give it. While it may look good in certain scenes, it may also hurt others. A great test pattern to use for this feature is an overscan pattern from Snell and Wilcox. This pattern is used a lot for setting sharpness in calibrations and you will

see how changing detail settings (or sharpness) will add ringing into an image to make things seem sharper.

“... exceptionally good ... passed every test in both our benchmark testing and the HQV test disc ... excellent job with diagonal line processing ...”

On the noise reduction side the Gennum does okay but not nearly as good as the Realta HQV chip. Even turning the Gennum to its max setting did not clear up the test sequences on the HQV test disc as well as the Realta processor. There was still some underlying noise apparent. The same was true for the motion adaptive noise reduction tests. The Gennum just cannot compete with the Realta chip in this case, but it did better than most consumer noise reduction features I've seen. About half of the noise was reduced overall.



The Crop Input menu has some very cool options including the ability to mask the borders of the image. Most people do not understand the importance of this feature because unfortunately most people's displays have a certain amount of overscan that cannot be undone. What this means is the display is cutting out a certain percentage of the active image. Normally this is right around 3-5% but I've seen even worse than that before. Personally I prefer my display to have 0% overscan. I want the entire active image. This is pretty much essential for reviewing purposes since we test things like pixel cropping, but I also like the piece of mind of knowing that my display is actually showing me everything that is supposed to be there. But there are occasions that this is not a good thing. With some cable or satellite broadcasts you will start to see information in the upper borders that is random noise. This is usually copyright coding and it can be distracting. Anthem has addressed this issue with a user specified amount of pixel cropping from 1-20 pixels. This worked exceptionally well with HBO-HD. That channel is always fine with movies and shows but the commercials in between always have a lot of garbage in the outer frame.

You'll also find adjustments for your letterbox settings. The Anthem allows you to letterbox or pillarbox any image you want or have a straight bypass altogether.

The next menu, Scale Output, allows you to adjust the size and position of the active image. It also lets you stretch the image or set a bypass for the scaler. So if you want 480P information to just pass through without scaling, it will do it. Same goes for any other resolution. This is a great feature on a per input basis for someone like me that tests a lot of different video sources.

The Pattern menu has some pre-rendered calibration patterns that some people may find useful. Most of the patterns are various color ramps in stepped form. Recently they added a SMPTE color bar pattern as well. While these patterns may be useful for some, I didn't get much out of them personally. I use very

specific patterns for calibrating my display and unfortunately these don't encompass the things I look for.

The last menu is the Info menu, which provides input and output information for your sources. There were a couple of occasions when the input video source displayed the wrong colorspace information. I honestly hope that Anthem does a bit more with this menu in the future.

During the course of the review I used various source devices and projectors. Sources included DVD players, an HD PVR Cable box, a D-VHS player, an HD DVD player and a home video game console. I used a BenQ 8720 DLP projector, Sony VPL-VW100 (Ruby) 1080P projector, Marantz VP12S4 720P DLP, and a Panasonic AE-900 through the course of the testing. This allowed me to test out the various color space outputs as well as evaluate the D2 for 1080i de-interlacing to 1080P into the Sony Ruby. All DVD sources were output at 480i. HD sources were set to 1080i output and the home game console was outputting 720P.

The first part of my evaluation was done with DVD at 480i being de-interlaced and scaled to the appropriate resolution for the respective projector. I started here because DVD is still the primary medium in home theater right now and represents the lions share of the software available to consumers. We put the D2 through our progressive scan benchmark and the Gennum VXP did an incredible job with all of our tests. The VXP really does represent the next generation of performance in video processing and is more in line with the offerings of the Silicon Optix Realta chip and the Anchor Bay Technologies ABT-102 board. These chips have taken video processing and cadence based de-interlacing to the next level, so much so that we will be updating our benchmark by year's end to take into account what is possible now and raise the bar on what constitutes top of the line de-interlacing performance.

The Gennum was exceptionally good with bad edit detection and locking on to cadences and staying locked. This was especially true with bad edits in source material. The VXP is one of only two chips that I've seen hold things intact through loops with difficult material, especially the famous Super Speedway clip found on the HQV benchmark DVD. Even the Realta chip with HQV processing can't hold things together through that loop. It passed every test in both our benchmark testing and the HQV test disc. It fared very well in the new DVDO Video Reference Series disc but tripped up with some of the harder mixed cadence tests.

The VXP does an excellent job with diagonal line processing with video based material. Up until recently the Faroudja DCDi solution was the only processor available to the general public that did well with diagonal line interpolation. That changed when the Silicon Optix Realta chip premiered in our reference DVD player, the Denon DVD-5910. While the VXP doesn't do quite as good as the Faroudja solution overall, it is pretty much on par with the Realta chip.

But the real standout for the VXP was its high definition video processing performance. Test patterns for high definition de-interlacing are extremely rare when it comes to video processing and I was lucky enough to see an early version of a new test disc that will be available in the next year. Stacey Spears and Don Munsil, former writers for *Secrets of Home Theater and Hi Fi* and the creators of the DVD Benchmark, have formed an outfit called Spears and Munsil (S&M) and are working on a disc for evaluation of high definition video processors. They are also the creators of Anchor Bay Technologies new Video Reference Series disc that is shipping with their new de-interlacing board, the ABT-102. Using the new Toshiba HD-A1 we were able to feed the D2 true 1080i test patterns for video setup and de-interlacing. The VXP did an exceptional job with the tests and passed the majority of the cadence tests including 1080i material mastered with 3-2 and 2-2 based cadences. It also held together through the brunt of the mixed cadence and bad edit tests, regardless of the amount of detail. It also does the same diagonal line processing for HD sources as it does for SD sources. The only other inverse telecine high definition processor (other than the Genum chip in the Marantz projector) we had on hand was the Sony Ruby itself. The projector's internal video processor does handle 1080i material but it is not near the same level as the Anthem Statement D2. It had issues with even the basic 3-2 patterns on the S&M test disc. We plan on creating a new high definition video processing benchmark at *Secrets* in the next year as more test material is created and will be incorporating most of the test patterns included on Stacey and Don's disc. We wish them both the best of luck with their business and thank them for the opportunity to try out the beta of their new disc.

For component to HDMI conversion I used the output of the new Xbox 360, which is limited to component but is 720P. The D2 worked without a hitch in its conversion to HDMI and I didn't notice a single instance of latency during any games including fast paced racing and first person shooters. All of the resolution of the 360 was kept intact and the image looked razor sharp. At this time this is the only source I have in my system that I use a component output for.

“... superb ... Anthem went above and beyond ... a one box solution that does everything and does it extremely well.”

For subjective evaluation of DVD I used a variety of players including the Sony 9100ES, Marantz DV-9600, Oppo DV970HD and Denon DVD-5910. All of the players worked without issue via HDMI except the Denon DVD-5910. For some reason this player would immediately lock up completely when connected to the D2 via HDMI. No matter how I set up either the player or the SSP the player would lock up. I am going to send the player to Anthem shortly so they can investigate the issue and hopefully resolve it. Over the course of development for the D2 Anthem have found a lot of issues with various HDMI products not meeting the specifications that they should have HDMI outputs. Because of this they've had to continually update the D2's software to find workarounds to make products work correctly with the D2. This has included several cable

boxes and DVD players. In the time I've had the D2 Anthem has corrected all of the compatibility issues I've found with DVD players and D-VHS players with the exception of the DVD-5910, which they haven't had yet to evaluate. So needless to say, product support has been phenomenal.

Moving on to high definition subjective evaluations were done with a variety of sources. On hand I had a Comcast HD PVR, a JVC 5U D-Theater D-VHS player, and the Toshiba HD-A1 HD DVD Player. I was able to look through quite a bit of pre-recorded content on HD DVD and D-Theater as well as material I had taped off of cable. Watching the pre-recorded content from D-Theater and HD DVD was by far the highlight of the evaluation and represented the best high definition viewing I've done to date. Using the Sony Ruby projector you got to see what the full extent of high definition could be with true inverse telecine de-interlacing of just about flawless HD material. In fact the only gripes I had was the motion artifacts present from the over compression present in the cable broadcasts. Unfortunately even the noise reduction filters in the D2 can't remedy this issue. HD DVD looked exceptionally good with no noise to bother at all. Titles like *Serenity* and *Phantom of the Opera* had amazing depth, clarity and color fidelity making them standouts in the evaluation. The difference between these HD DVDs and their standard DVD counterparts was not even close to subtle in A/B comparisons regardless of the source device. I tried the Marantz DV-9600 into the D2 at 480i via HDMI and also the Denon DVD-5910 and despite having some of the best video processing capabilities on the market available, they were just no match for the inherent resolution and color capabilities of the HD DVD format. I did have some issues with the D2 locking on to the correct colorspace for the Toshiba HD-A1 in the beginning but Anthem resolved those within about a week and I've not had an issue since. I do, however, have random HDMI communication link dropouts between the HD-A1 and the Statement D2. The HD-A1 has some HDMI output issues that are to blame and this became a rather frustrating issue over the last few weeks. Anthem is currently working with Toshiba's new firmware and hopes to resolve these issues soon.

Currently the Anthem Statement D2 represents the best high definition video processor we've evaluated to date. Its standard definition processing is better than any SSP or receiver I've tested and in line with the best processors I've seen on the market yet. The Realta HQV chip and the DVDO ABT-102 still do a bit better with mixed cadences. The fact that this add-on costs considerably less than what it would cost to buy a processor that would even be in the same league makes this one of the best values I've ever seen; especially if you are already a D1 owner.

Audio evaluations were a bit of a moot point. We've already covered the D2's audio capabilities extensively either as a footnote to existing reviews or in Brian's excellent review of the D1. Nothing has changed in this regard except for support of HDMI. For this I used the JVC 5U D-Theater deck, the Xbox 360, the Toshiba HD-A1 HD DVD player and the Pioneer Elite 79AVi.

Dolby Digital and DTS soundtracks were supported via HDMI without a single hitch regardless of the format. I tried this with D-Theater, DVD and HD-DVD as well as games on the Xbox 360. There wasn't any difference in overall quality either compared to the standard coaxial or SPDIF inputs.

"... one of the best values I've ever seen ... an investment that will pay off for a long time to come ... the D2 will continue to be my reference Audio/Video processor ... I could not recommend a product more."



DVD Audio was probably the biggest difference. I used the Pioneer DV-79AVi for transmission of high resolution DVD Audio via its HDMI output. This means the player decodes the MLP compressed material and sends the raw high resolution PCM data to the Anthem without any post-processing such as time alignment or bass management. All of this is done within the Anthem. Like all incoming digital signals, the Anthem upsamples the high-resolution data to 192/24 and will add any post-processing you want to the signal. This again includes THX modes or enhanced surround modes like PLIIx, all in the digital domain. The difference was noticeable in comparison to the analog outputs of the Pioneer Elite player. Bass response seemed a bit cleaner and imaging was tighter with the majority of the material I used. I was really bummed that I didn't have the chance to try out the Denon DVD-5910 like this. It supports HDMI 1.1 and has excellent audio playback capabilities through its analog outputs. But I have found over the last few years that I like the D1 better for stereo playback with the Denon 5910 feeding it coax digital information. CDs sound considerably better with a broader soundstage, more body and tighter bass. I was anxious to see if this would be the case with DVD Audio as well. I hope to have that chance soon.

Anthem is the only company I know of that is allowing the end user to set their speaker configuration for DVD Audio with HDMI. HDMI does not dictate what channel is what with high resolution PCM. There is an auto setting in the D2's setup that worked every time though and placed the outputs to the correct amplifier channel, but I use a different speaker configuration for DVD Audio playback. Instead of using my dipole surrounds, I use my direct radiating rear speakers for the surrounds with surround sound music. Anthem is the only company I know that lets you dictate what channel information goes to what output with HDMI but unfortunately they are not support the rear speakers for this. I have my fingers crossed that at some point the D2 will allow me the option of doing this like they do with the analog inputs. It is one of my favorite features of the D1!

I would say the most exciting part of the audio evaluation for me was trying out the new HD DVD format and Dolby's new DD+ format. For this I used the Toshiba HD-A1 HD DVD player and had the player output multi-channel PCM. The internal Dolby Digital decoder decodes the DD+ soundtracks to PCM. For some reason Toshiba has included some type of post processing because all of the PCM coming out of the HD-A1 was upsampled to 96/24. The Anthem then upconverted this audio to 192/24. I had the D2 set to apply Dolby PLIIx to all incoming multi-channel signals. The soundtracks sounded superb. Universal's release of *Serenity* was especially impressive with ample use of the surround channels and very clean bass. I am really looking forward to doing some A/B comparisons as more titles are released in this format.

Since HD DVD and Blu-ray decode their high-resolution soundtracks internally and output high resolution PCM, this brings up a major concern for outboard video processors and a major advantage for the Anthem D2. Currently only a handful of outboard video processors handle HDMI, and I don't know of any that will pass through high resolution PCM. Most will output the standard Dolby Digital and DTS soundtracks though. But how do you handle this with HDMI? Most video processors only have one HDMI output and that needs to go to the display, so how do you get the PCM data to your SSP or receiver? I suppose you could use a splitter for the signal, but since most video processors don't pass through high resolution PCM, that data is lost. That means you are stuck with either resorting back to the analog outputs or something like the Anthem Statement D2. With these new formats coming out it is becoming apparent that the need for an all-in-one audio video processor will become a factor if you want the most out of the new formats. Either that or outboard video processors will need to find a way to pass through high resolution PCM and have dual HDMI outputs so that one output can feed a display and the other can feed a receiver or SSP. Anthem went above and beyond this and offered a one box solution that does everything and does it extremely well.

CONCLUSION

The D2 encompasses one of the best add-ons I've ever seen for any product, period. As a stand-alone video processor it is outstanding and better than the vast majority of video processors I've ever evaluated. The fact that it does true HD video processing makes it a standout in a very limited market. Couple this with the HDMI switching and the fact that it supports all the audio formats that will be soon become the new standard with HD DVD and Blu-ray and you have an investment that will pay off for a long time to come. The Anthem Statement D2 will continue to be my reference Audio/Video processor and I could not recommend a product more.