stereophile
ultimateAV
Electronically reprinted from March 2007

Video Projectors

JVC DLA-HD1 1920x1080 Home Theater Projector

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In the past few months we've seen a revolution in the video projection business. A revolution no one expected. The prices of home theater front projectors have been dropping nearly as fast as flat panel displays.

Since the September 2006 CEDIA Expo we've seen the introduction of at least six 1080p projectors priced at or below $6,500. We've already reviewed three of them (the Sony VPL-VW50"Pearl," , the Optoma HD81, and the Mitsubishi HC5000. A fourth, the JVC DLA-HD1, was the subject of a Short Take a few weeks back. While the JVC is the most expensive of all of these models, in many respects it's also the most exciting. This is the full review.

At $6,300 (a replacement lamp is priced at $399), the DLA-HD1 is one of two new projectors from JVC. The other is the RS1. According to the company, they differ in only two ways. The RS1 is sold through JVC's professional channels, and the HD1 is sold through consumer outlets. In addition, the HD1 is black and silver (see photo) and the RD1 is all black. But with respect to features, performance, and price, the projectors are identical.

Technology and Features

LCoS, or Liquid Crystal on Silicon, is a variation of LCD technology. Sony uses a variant of LCoS that it calls SXRD, while JVC uses the moniker D-ILA for its LCoS designs. Most LCD devices are transmissive. That is, the light passes through the imaging chips and emerges from the other side, modified as required by the image to be displayed. This has advantages—LCD can be used in either flat panel displays with a backlight or in front or rear projection applications using a miniaturized imaging chip and a lamp as a light source. But LCD also has disadvantages. A major downside is increased spacing between the pixels, a requirement to accommodate the near-microscopic wiring needed to pass signals to those imaging elements. This spacing can result in the"screen door effect," which at its worst can look exactly as that name implies as the pixel structure becomes visible on screen, though practically speaking this is less of a problem today than it was when panel resolutions were lower.

In an LCoS design the light source passes through a much thinner LCD layer, is reflected, passes back through the LCD layer, and emerges on the same side from which it entered. The circuitry to drive the pixels can therefore be located behind them rather than between them, so the spacing between pixels can be much smaller. This narrow pixel spacing results in a high"fill factor" in an LCoS display—that is, more of what you see on-screen is actual picture information rather than dead space between the pixels. One disadvantage to LCoS is that it is suitable only for projection applications, not for flat panels.

Until recently, LCoS was behind DLP in some aspects of its performance and in price. DLP has made huge gains in recent years in improved black levels and increased contrast ratios. And DLP projec-

tors are now available at prices more videophiles can afford than ever before. LCoS was, by reputation, plagued by both low yields and mediocre contrast, which resulted in high prices and grayish blacks.

Sony broke those roadblocks with enhanced yields on its SXRD chips, gaining economies of scale by using the chips in a range of products priced for a wide market. Sony also engineered the most effective dynamic irises in the industry, dramatically lowering black levels.

JVC, however, has been in the business of producing LCoS video displays longer than anyone, and has clearly now been able to lower costs and increase yields as well. For these new projectors, JVC has designed both a brand new D-ILA chip and an improved light engine. The new 0.7-inch, 1920x1080 D-ILA chip employed here is spec'd for a chip-level contrast ratio of 20,000:1. This is made possible by a major reduction in the crossover of stray light between the pixels. The projector overall, including the chips, light engine, and optics, is specified to have a native contrast ratio of 15,000:1.

At present JVC is using this new D-ILA chip and optical engine only in these two new front projectors. The new components are not yet employed in any of the company's more expensive projectors or in the highly tweaked versions of those projectors that are available from Meridian/Faroudja. But I would not be surprised to see one or both new developments turn up in future JVC products.

The improved black level in these new projectors has come exclusively from the new chip and light engine. They have no iris of any kind, fixed or dynamic. The only control over light output, apart from the Contrast control, is a two-position brightness adjustment for the 200W UHP mercury lamp. The High position of the lamp is about 20% brighter than the Normal position.

Zoom and focus are manual, as are *both* horizontal and vertical lens shift. The lens has a fairly long throw; for a 100" diagonal image (87" wide 16:9 screen) the projector may be set up anywhere between 9.9- and 19.9-feet.

The DLA-HD1 provides one input each for component, composite, and S-Video, plus two HDMI 1.2 ports. There is also an RS-232 (9-pin D-sub) terminal.

Operating controls are located on the top of the case, but every control you'll need is also available on JVC's well-designed remote. The remote offers direct input selection and direct access to a number of frequently used functions, including Brightness, Contrast, Color, Sharpness, and six different Image Profiles: Cinema, Natural, Dynamic, and User 1,2, and 3. While the video adjustments are global across all inputs (you can't set in different values for different inputs) you can set up different profiles that cover a wide range of video adjusments and use these for different inputs. In addition to the option to configure each of the three User settings, you can also alter the factory settings for the Cinema, Natural, and Dynamic profiles as well.

There are five Color Temp. selections: Low, Middle, High, User 1, and User 2. Both User settings provide separately adjustable overall Red, Green, and Blue adjustments, but do not offer control for *<BOTH< I>the top and bottom of the brightness range.*

The same color temperature control limitations apply to the code-locked Service menu, so there is no particular advantage for a calibration technician to go there unless you want to recalibrate the Low, Middle, and High factory default settings. The latter do not offer user accessible Red, Green and Blue controls. But a separate set of Red, Green, and Blue controls in the user menu, called "Offset," allow you to tweak the five Color Temp. options.

But the Offsets are global—you can't set them separately for each of the Color Temp. choices. My recommendation for those who choose to calibrate the projector (which I recommend) is to first make certain that the Offsets are set to zero, then perform the calibration using one or both of the User settings. For security against someone changing the calibrated settings, write them down. After that, leave the Offsets alone unless you find a program with obviously whacked-out color, such as too-green flesh tones. In that case, use the Offsets for very fine adjustments, carefully returning them to zero for better-produced programming.

The projector does not offer a manual selection (or an auto switchover, as far as we can determine) between the NTSC color space (REC601) and ATSC color space (REC709 for DTV/HDTV). Since the specifications do not mention the ATSC color system at all, and our test tools cannot check for this, I have to assume that the projector

uses NTSC color (REC601) for all sources. This will result in inaccurate color for some sources, but the color never looked clearly"wrong" on any of the many sources I watched.

All LCoS projectors are three-chippers—one each for red, green, and blue. If the chips are not aligned precisely, you'll see misconvergence that can affect the sharpness of the image. The JVC has adjustments to converge the red, green, and blue chips, with up to seven pixels of movement in single pixel steps in both the horizontal and vertical directions.

This is a the first time I've seen this feature in a three-chip projector, and they should all have it. The convergence had been set reasonably well at the factory, though I added a single additional step to the vertical blue channel. This put nearly everything within one-half pixel or less of proper alignment. Unfortunately, vertical lines at the far right side of the image were off by up to one pixel, primarily in red. This was rarely noticeable from a normal viewing distance, and then only as a slight red edge to very high contrast objects on that side, such as white titles on a black background. A difference in pixel convergence in different parts of the screen is generally due to chromatic aberration in the lens or something else in the optical path, not panel misalignment, which would be uniform across the entire screen.

A Mask control, available only for 720p and 1080i/p sources, masks off the image on all sides by either 2.5% or 5%. This control can be useful when there's garbage on the screen at one or more edges. Artifacts at the edge of the screen are now fairly rare. But on a display with little to no overscan, like the JVC (see"Measurements"), they can be distracting when they do occur. Some displays offer"overscan" controls that reduce image resolution. The JVC's Mask control, however, crops pixels from all sides of the image without upscaling it to fill the screen. So you get a slightly smaller image (unless you manually zoom the image to fill the screen again), but the resolution is not degraded.

The JVC will accept both 1080p/60 and 1080p/24 inputs in addition to the other usual suspects: 480i/p, 720p, and 1080i. When I wrote the Short Take for this projector, I did not know exactly how the projector handled a 1080p/24 input. Now I do. According to JVC, it quadruples the frame rate to 96fps. The HD1's Gennum GF9351 scaling/deinterlacing chip doubles the 24fps input to 48fps, the 48fps to 96fps step is added elsewhere in the projector's video processing, downstream of the Gennum. This eliminates the need for 3/2 pulldown with 1080p/24 sources.

The only consumer sources of 1080p/24 material at present are the outputs of a few (not all) Blu-ray players. Movie material on HD DVD is also native 1080p/24, but as yet no HD DV D players will output this resolution. Instead, they convert it, at best, to 1080p/60, with 3/2 pulldown. (A firmware update to Toshiba's HD-XA2 to allow 1080p/24 output is rumored to be imminent- Tech Ed.)

Other features include six different built-in test patterns, a video/film mode (Auto or Off), HDMI input level (Standard, which is the one to use, or Enhanced), Black Level (a 0% or 7.5% offset adjustment for the video and S-Video inputs only), a selection to allow the component input to accept RGB sources or even SCART (for those in Europe), Aspect (4:3, 16:9, or Zoom—no fancy stretchy modes here), Menu Display (times out the menus in five seconds or leaves it on until you defeat it, thus lowering the blood pressure of calibrators everywhere), and the ever popular Sleep Timer.

Performance

While I've found some minor issues, none of them diminish enthusiasm for this product—an enthusiasm that has, if anything, increased since my Short Take report.

While the JVC isn't quite a light cannon, it's definitely bright. Out of the box, it put out just over 20 foot-Lamberts on my 78" diagonal, 16:9 Studiotek 130 screen (white, 1.3-gain) in the Normal lamp mode, and 25fL in High. After 200

hours, including a fresh calibration, this decreased to a maximum of 16.3fL (Normal lamp mode) on the same screen. This 20% decrease, in my experience, is not unusual in lamp-driven projectors. Above this point the whites clipped, but unlike many projectors, which tend to show subtle discolorations in a multi-step grayscale pattern when pushed to their pre-clip limits (tints that often don't register in the grayscale measurements), the JVC held thje pattern to a true white-gray-black, without odd color shifts. And at this same 200-hour mark I could still wring 20fL out of the projector on my screen if I switched to the High lamp mode.

The deinterlacing and scaling of the JVC turned in a fair performance overall. It was good to excellent when upconverting a 480i component input to the projector's native 1080p. But it degraded

to fair, at best, with a 480i HDMI input. Here it clearly stumbled on some of my standard tests for jagged edges.

The problem appears to originate in the JVC's 480i-to-480p deinterlacing. To check for this, I fed the projector the same material in 480p HDMI from a Toshiba HD-XA2 HD DVD player. The latter is equipped with a Silicon Optix HQV REON processor, which we know to have outstanding 480i-to-480p deinterlacing. The result: all of my jagged edge tests now looked flawless on the JVC.

This result suggests you should avoid feeding the JVC a 480i HDMI source. Why the projector's deinterlacing of 480i-to-480p is better in component than in HDMI remains a mystery. But it is. Fortunately, I can't think of a compelling reason to use an HDMI source at 480i.

The JVC de-interlaced 1080i program material (both film and video) directly to 1080p, as it should. But it did not recognize 3/2 pulldown in a 1080i film source. While the latter limitation was quite visible in test patterns, I never saw any evidence of it with real 1080i program material.

Most of the criticism of past LCD and LCoS projectors has focused on their blacks, with good reason. But the LCD and LCoS projectors I've reviewed before have also had a tendency to look a little faded on bright scenes as well, which reduced their punch and dimensionality. This effect is subtle on the best of these projectors, but never completely absent. Many of these displays were equipped with auto irises.

I noted this in my Short Take report on the JVC as well, but I also observed that the JVC suffered less from this bright scene fading than most LCD and LCoS designs I've seen, even those that like the JVC don't use an iris. A dynamic iris can greatly improve the depth of a projector's blacks in dark scenes, but once it opens up on a bright scene you're left largely with the naked, native contrast of the imaging chip and light engine.

While such fading isn't entirely absent in this new JVC design, I have found it to be more and more difficult to spot, particularly since the Sharp XV-Z20000 DLP was sent back to its maker and the opportunity for additional A/B comparisons thereby eliminated. I saw it rarely before; now it doesn't bother me at all. While some bright scenes initially looked a bit more saturated and three-dimensional on the Sharp compared to the JVC, I now find that the JVC's image, particularly on good high-definition material, offers plenty of depth and dimensionality.

The JVC is very quiet in its Normal lamp mode, and only slightly louder in High. It's not as quiet as the Sony Pearl or Mitsubishi HC5000, but quieter than the Sharp XV-Z20000. Its noise is also pitched fairly low, making it less intrusive than the usual high frequency, rushing air sound.

While I didn't use the JVC's Dynamic Noise Reduction for serious viewing and testing, it was very effective. At a setting of 11 out of 30 it virtually eliminated some annoying grain/noise in the standard DVD transfer of *Star Trek: Insurrection*. It made the image far more watchable, and did *not* make it soft. Each increased step in NR is subtle, making it a very effective tool for improving marginal transfers.

I noted earlier that when the JVC receives a 1080p/24 source, such as the native video from a Blu-ray Disc, it quadruples it to a frame rate of 96fps and displays it without the usual motion judder of 3/2 pulldown present in 24fps, film-based material displayed in video format at 1080p/60. In theory this should result in smoother motion. And that's just what I saw. But the improvement is not immediately obvious; 3/2 pulldown judder is something we've all lived with so long that most of us can tune it out. It's nearly impossible to spot on rapid motion. But if you look carefully you'll see improved smoothness in slow pans, zooms, and the sort of leisurely motion that hides motion blur in displays prone to it.

While I did see some very subtle motion blur in fine details moving across the screen, I see the same effect from DLPs. The only modern display technology that can do better on this (sometimes) is plasma.

While the subjective color of the JVC was excellent, some of its primary (red, green, and blue) and secondary colors (yellow, cyan, and magenta) were a little oversaturated. Green glowed too brightly on sunlit foliage. Red was also a little intense, though unlike green, a bit too much fire in the reds can often be pleasing—provided that flesh tones look right. And the JVC's post-calibrated flesh tones were just fine, as long as the program source allowed them to be (there's a lot of color processing going on in today's films).

The color temperature was reasonably accurate in the Middle Color Temp. setting, but minor tweaking in the user controls (with appropriate calibration tools, of course) produced an even better and more accurate result. But it did take different settings for the best results in each of the two lamp modes. Fortunately,

the projector provides those two User color temperature memories. If you have a need to alternate between lamp levels, perform two color temperature calibrations and save each one separately.

While less than specified (not uncommon), the JVC's contrast ratio still provides state-of-the-art performance for a digital projector (See "Measurements.") The only chink in the JVC's black-level armor is a slightly brighter level in the four corners of the screen, noticeable mainly when the projector is displaying a completely black or very dark image. (I saw this same artifact on the Sony VPL-VW100 or "Ruby," but not on the Sony VPL-VW50 "Pearl.")

If I had never seen a CRT projector, I would be tempted to call the JVC's blacks spectacular. Typically, the full-screen video black levels on the best DLP projectors have measured between 0.005 and 0.008 foot-Lamberts. The Sharp XV-Z20000 set a new record of 0.002fL. And the JVC, together with the Sony VPL-VW50 "Pearl," measured approximately the same (I say approximately because the Minolta LS-100 we and nearly everyone else in the industry use for this measurement is only good to three decimal places and then

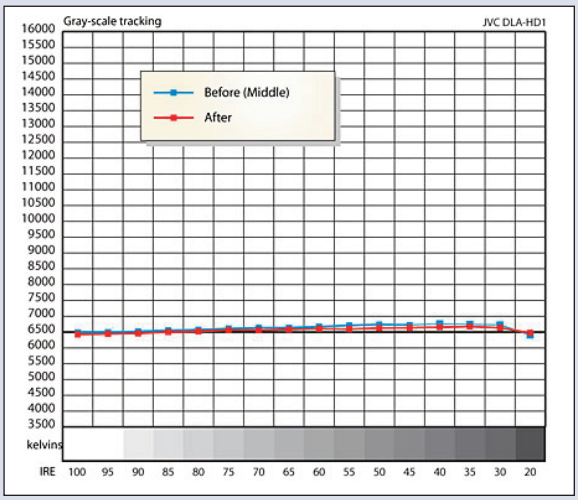
Measurements

With a component 1080i input, the JVC's black and white (luminance) response to the multiburst patterns on my AccuPel HDG-3000 test-pattern generator held up well to 37.1MHz with no unevenness, though the output there was clearly down in level compared to the 18.5MHz burst. There was also some *very slight* edge enhancement that could not be defeated by reducing the Sharpness control without excessively softening the image. At 720p, component, the response was also still visible at 37.1MHz, though more reduced in level and with a bit more edge-enhancement. Both 480i and 480p looked good to their specified limits (6.75MHz and 13.5MHz, respectively), though there was clearly visible, non-defeatable edge enhancement.

With an HDMI input at 1080i or 720p, both the color and black and white response were still visible and clean at 37.1MHz, though subtly down in level—just a hair short of the best I have seen from a projector (the Marantz VP-11S1). There was no visible edge enhancement at all at 1080i, and the Sharpness pattern was crisp and clean. The same for 720p, though at that resolution a bit of edge enhancement was added. The 480i/p responses were essentially the same as component.

With the Mask control off, the overscan was zero on all sides in 720p or 1080i, HDMI or component. In 480i/p it ranged between 2% and 3%.

The JVC's color points were typical of most new digital projectors and short of ideal. Red and blue were a little oversaturated, green was very oversaturated. While the subjective color of the projector was good, I wish manufacturers would at least give us the option to select accurate colors.



Before calibration, the JVC produced its best grayscale in the Middle setting. The Low setting dropped down to about 6000K across the full brightness range, and the high setting was over 10,000K. The Before and After results of the calibration I performed are shown in the chart (using the Normal lamp setting). The After results don't differ all that much in their Kelvin temperatures, so the Before and After results appear to be very similar. But, as usual, the accuracy of the points themselves came closer to the D6500 standard after calibration (6500K is a line on the color chart, but the D6500 standard is the exact point on that line we're aiming for). The single adjustments for red, green, and blue proved sufficient to get a good result. This is not true of all displays, which often need high and low adjustments, but don't always provide them.

I measured the JVC's contrast ratio by placing the projector very close to a screen, producing an image less than 2-feet wide. This not only raised both the black and white levels to a point where the black level could be read by my Minolta LS-100 light meter with greater accuracy, but also limited the light reflected around my non-black room so that I could determine a modified ANSI contrast (measuring just the four center squares of the 16 squares on the standard ANSI checkerboard pattern). I measured a peak contrast ratio of 8752:1 and a modified ANSI contrast of 139:1, both with the Lamp on Normal. (I also ran these measurements on the Sony Pearl under the same conditions, in Auto Iris 2, Low lamp, and obtained readings of 5949:1 and 133:1, respectively.)

In the Normal Gamma setting (which I used for all of my testing and viewing) I measured a gamma of very close to 2.2 across most of the brightness range from dark to bright, increasing to 2.5 at 20IRE (the lowest point measured) and decreasing slightly to 2.1 at 90IRE at the top end.

only down to 0.001fL).

But unlike the Sharp, the JVC can deliver this low black level while set up for a higher peak white output. In other words, the JVC can be, simultaneously, both brighter on bright scenes and darker on dimmer ones than the Sharp. In both respects the JVC is also slightly superior to the Sony Pearl. And unlike the Sony, it does not use a dynamic iris to achieve those deep blacks.

Comparisons

Sharp: The black level capability of the JVC is, indeed, directly competitive with that of the $11,999 Sharp XV-Z20000 (which like the JVC does not have an auto iris). Overall, however, the Sharp XV-Z20000 still has the best combination of deep blacks and consistent scene-to-scene contrast ratio I've yet seen on a digital projector.

While the JVC could match or even exceed the Sharp in its measured black level and peak contrast ratio, and on many scenes looked every bit as good, there were some scenes in which the prize clearly went to the Sharp. Blacks could turn a little gray on the JVC in scenes with dark foreground details and strong backlighting. For example, in the 2005 *King Kong* there's a sequence in which Kong is rampaging in Times Square just after breaking out of the theater. In one shot, just over half the screen is covered with Kong's head and shoulders, with a bright neon sign above and behind him. On the Sharp, Kong's fur remains a dark gray, with its detailing still evident. On the JVC, the fur is still nicely detailed, but it's a lighter, paler gray. In another example from chapter 43 of the same film, there's a night shot of a New York street as Ann Darrow (Naomi Watts), backlit, walks slowly toward Kong. It's intercut with shots of the big ape. Again, the Sharp looks a little more dimensional in this scene, with better apparent contrast.

Although the Sharp's picture did"pop" a little more realistically than the JVC's, the difference, more often than not, was elusive. Comparative (not absolute) measurements suggest that the Sharp has superior ANSI contrast (which shows how well the blacks and dark grays stay dark in the presence of bright areas in the image), but the JVC has better peak contrast (peak white output divided by the level of video black). This *might* be one explanation for the visible differences I saw on some real program material, and why those differences could come and go on different scenes.

But at a shade over half the price of the Sharp, the deep black and contrast ratio performance of the JVC can only be described as amazing.

On most program material, I also found the JVC to be a hair sharper than the Sharp. This was surprising, because while both projectors clearly responded to the 37.1MHz video burst on my AccuPel test pattern generator (tested in HDMI), the response of the JVC at that frequency was down a bit in level compared to the Sharp.

There's also the issue of rainbows. Like all single chip DLP projectors, the Sharp will occasionally show them. They weren't as distracting to me as on some DLPs (and single-chip DLPs, in general, are far better at suppressing rainbows than in early DLP designs). But the three-chip JVC will never flash a rainbow.

But on much of the program material I watched I could switch back and forth between the Sharp and the JVC and not be able to make an easy, clear call as to which I preferred. And when I did see a difference worth commenting on, the far less expensive JVC sometimes came out on top. The more time I spent with the JVC, the more excited I became at its combination of performance and value.

Sony: In my First Look I concluded by deduction that the JVC was sharper than the Sony Pearl. No further need for (elementary) deduction now; I was able to spend the better part of a day directly comparing the JVC to the Sony, using

SPECIFICATIONS

Display panel/size: D-ILA device, 0.7" (1920x1080 x 3)
Projection lens: 2.0x manual zoom (zoom/focus manual)
Lamp: 200W Ultra-high pressure mercury
Color System: NTSC, NTSC4.43, PAL, PAL-M, PAL-N, SECAM
Analog video input format: 480i/p, 576i/p, 720p/50/60Hz, 1080i/50/60Hz
Digital video input format: 480i/p, 576i/p, 720p/50/60Hz, 1080i/50/60Hz, 1080p/24/50/60Hz, VGA 60Hz
Inputs: one each composite, S-Video and component, two HDMI (HDCCP compliant)
Power consumption: 280W (Standby: 2.8W)
Installation altitude: Below 5000ft
Weight: 25.5 lbs
Dimensions: 17.9" x 6.9" x 16.5" (WxHxD, excluding lens and protrusion portion)

REVIEW SYSTEM

Sources
Toshiba HD-A1 and HD-XA2 HD DVD players
Pioneer Elite BDP-HD1 Blu-ray player
Pioneer Elite DV-79AVi universal DVD player NAD Masters Series M55 universal DVD player
AccuPel HDG-3000 test pattern generator
Video Cables
Ultralink and Monster HDMI
Tributaries component
Screen
Stewart Studiotek 130 (78" wide, 16:9, white, 1.3-gain)
Power conditioners
APC S15 (sources)
Audio Power Industries Power Wedge VI (projectors)

Manufacturer
JVC Company of America
www.jvc.com
(973) 317-5000

1080i high-definition material primarily from HD DVD. A 1080i source, rather than 1080p from Blu-ray, was used to include the 1080i-to-1080p conversion of each projector in the evaluation.

As with the Sharp comparison, both projectors were driven from the same source using PureLink's HD-150, a superb 1-in, 5-out HDMI distribution amplifier. The images were projected onto the same screen, and the light alternately blocked or passed from each projector. This enabled an instantaneous switchover from one to the other. I was very careful to calibrate each projector for optimum setup, and was fortunate to be able to get the peak white output of the projectors to within 1fL of each other.

Highs
Sharp, crisp image
Superb blacks and shadow detail
Quiet (but not silent)
Remarkable value

Lows
Lacks separate high and low color temperature adjustments
Color points could be more accurate

It was shocking just how closely the two matched. When viewed on its own without a direct comparison, the Sony still showed itself to be a very fine projector—the best available (in my opinion) for under $5,000. I had no complaints about its image in any respect. But on a direct comparison to the JVC, the latter pulled ahead in three areas.

First, the JVC was sharper. But not by a huge amount. Contrary to the popular Internet myth, the Pearl is *not* soft. Soft-er, but that's not the same thing. In any well-transferred film, there are well-focused shots and those that are slightly "off." You'll never spot these variations in a typical movie theater with its typical crappy projector, cheap projection lens, and a mass-produced print, which is why filmmakers can get away with it. But play a good high-definition film transfer through the Sony and you'll see these differences easily.

So while the resolution differences between the Sony and the JVC, even in a quick switch from one to the other, do not jump out and grab you by the throat, you can see them if you look closely. And even subtle differences in sharpness can have a cumulative subjective impact over time.

The Sharpness differences between the Sony and the JVC might have been at least partially due to the fact that the Sony sample in the comparison was misconverged by a full pixel (to the right) in red and a half pixel (to the left) in green. This is factory-fixed in the Sony and cannot be corrected. The JVC was not perfectly aligned either (as discussed earlier) but the error it its case was much smaller, and irrelevant in the important center of the image. Both projectors, incidentally, performed equally well on our standard 1080i luma resolution test.

Second, the JVCs shadow detail was better. While the deep blacks of both projectors were very similar and hardly worth picking a fight over, the JVC was better at bringing out subtle, slightly brighter highlights in most dark scenes. This is almost certainly due to the brightness compression in the Sony's dynamic iris. When the iris closes down on dark scenes, it also chokes off these highlights a bit, too—not enough to compromise the picture significantly, but enough to limit the way in which those highlights can enhance a scene.

And third, the JVC's image was more vibrant and three-dimensional. The above two characteristics likely contributed to this, together with slight differences in the gamma of the two projectors. And, again, the Sony by itself did was not obviously lacking here. But the JVC simply came out on top.

The differences I saw between the Sony and the JVC in my comparison were very similar to what I've seen from the two projectors in JVC's very public demonstrations. But they were less obvious. I suspect (he said, modestly) that I took more time in optimizing each projector, and matching their setup where such adjustments did not compromise the performance of either of them. I'd also say that the differences in the prices of the two projectors were representative of their performance differences. If you kick in just a bit more cash, the JVC gives you that extra kick toward (unattainable) perfection.

The Bottom Line

I'm not sure if all of the individual details I've mentioned here adequately convey just how impressed I am with the JVC's overall performance. You really have to see it to appreciate it. I've lived with it for several weeks now, and it hasn't failed me yet in the way it presents the pristine images available from the best program material. It even appears to get the best out of average sources (though some programming, clearly, will always be hopeless).

No projector I've had in house since my days of reviewing 9" CRTs (now four years past) has provided a bigger double-wow experience—"wow" for the quality of its images, and "wow" for its amazingly affordable price. The JVC's image is bright and compelling. Nothing odd, such as digital artifacts, ever limited my enjoyment. The best standard definition discs looked close enough to HD that they would likely fool many an average viewer, and HD wove its expected magic.

In short, the JVC DLA-HD1 is, without question, the best projector I've yet laid eyes on for under $10,000.