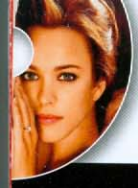

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Test Bench

BY Thomas J. Norton

JVC DLA-HD950 D-ILA Projector

PRICE: $8,000 **AT A GLANCE:** Superior black level and shadow detail • Accurate color • Brightness to spare

Setting the Bar Higher

Since the launch of JVC's DLA-RS1 projector more than three years ago, consumers have anticipated each of the company's new DLA designs. In some respects, such as resolution and brightness, JVC's projectors have run neck and neck with their competition. However, they haven't broken new ground. But with regard to producing inky black levels, without the help of a dynamic iris, they arguably have no equals.

That remains true. JVC's newest complement of home theater projectors includes three models: the DLA-HD550, the DLA-HD950, and the DLA-HD990. The first of these is the company's entry-level model. However, calling the DLA-HD550 entry level glosses over the fact that it's similar to the others in many ways. It just has less adjustability and fewer features. The DLA-HD950 provides additional picture controls and a higher claimed contrast ratio. The flagship DLA-HD990 is basically a premiere version of the DLA-HD950. It has the same features, but it claims to offer an increased contrast (possibly due to a cherry-picked optical engine).

All three of these new models have twins in JVC's Pro line. They have different model numbers and different distribution channels, but they feature parallel prices and identical designs.

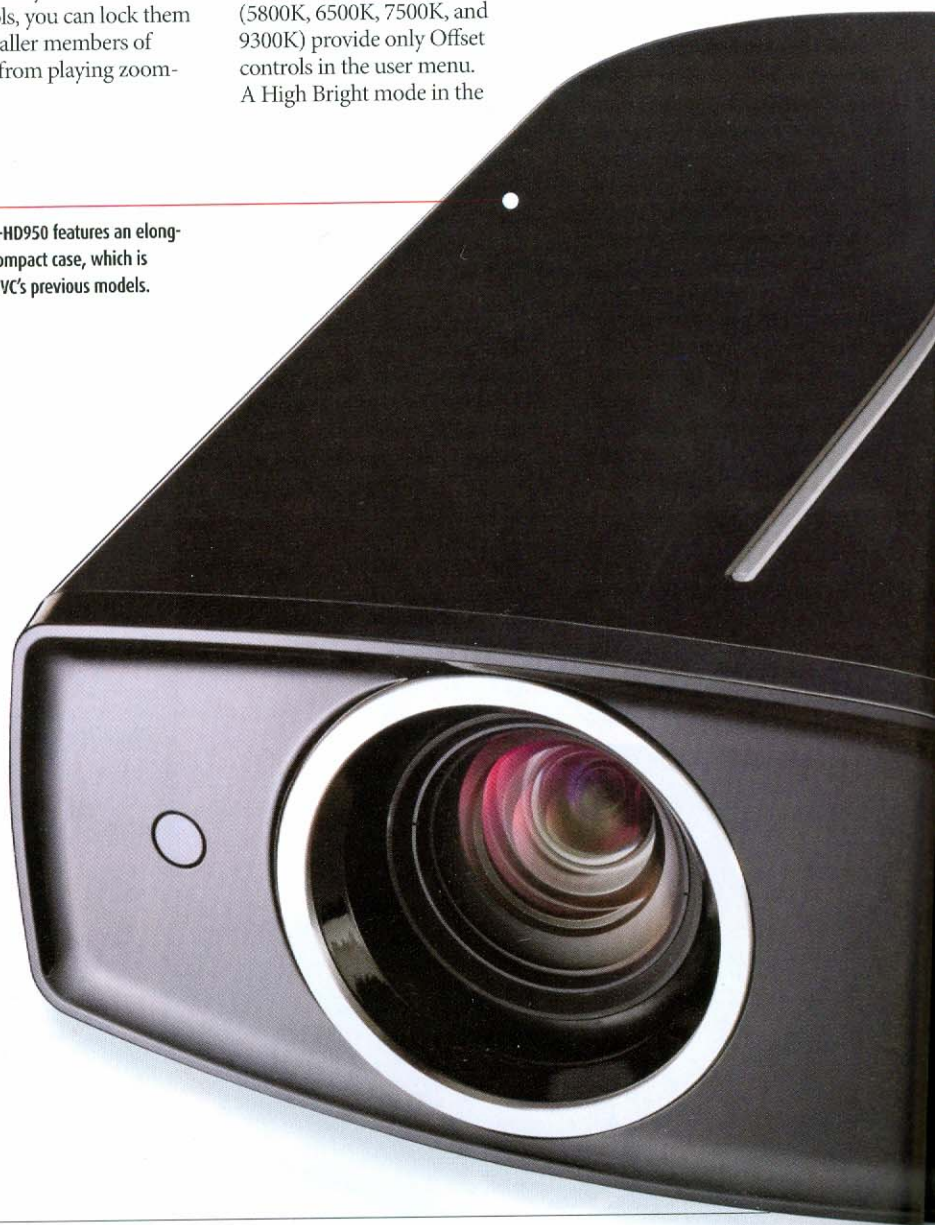
Features

The DLA-HD950 has the same elongated and relatively compact case as the DLA-HD750. The motorized lens adjustments include focus, zoom, and horizontal and vertical shift. Plus, it has a sliding lens cover. The zoom lens has a throw distance of 9.9 to 20.1 feet for a 100-inch-diagonal (87-inch-wide) 16:9 screen.

The projector includes built-in test patterns to help you make the lens adjustments. You can also turn them off and use an external source to tweak the settings. Once you've set the lens controls, you can lock them to keep smaller members of the family from playing zoom-zoom.

The DLA-HD950 offers nine picture modes, including two User selections. It has three custom Color Temperature options, which each offer Gain (high) and Offset (low) settings for red, green, and blue. Four other Color Temperature choices (5800K, 6500K, 7500K, and 9300K) provide only Offset controls in the user menu. A High Bright mode in the Color Temperature menu gives a higher priority to light output than image accuracy, so you should ignore it for home theater use.

The DLA-HD950 also has a full six-axis color management system (CMS). It controls Hue,



• The DLA-HD950 features an elongated but compact case, which is similar to JVC's previous models.

JVC DLA-HD950 D-ILA PROJECTOR
PERFORMANCE ★★★★★
FEATURES ★★★★½
ERGONOMICS ★★★★½
VALUE ★★★★½

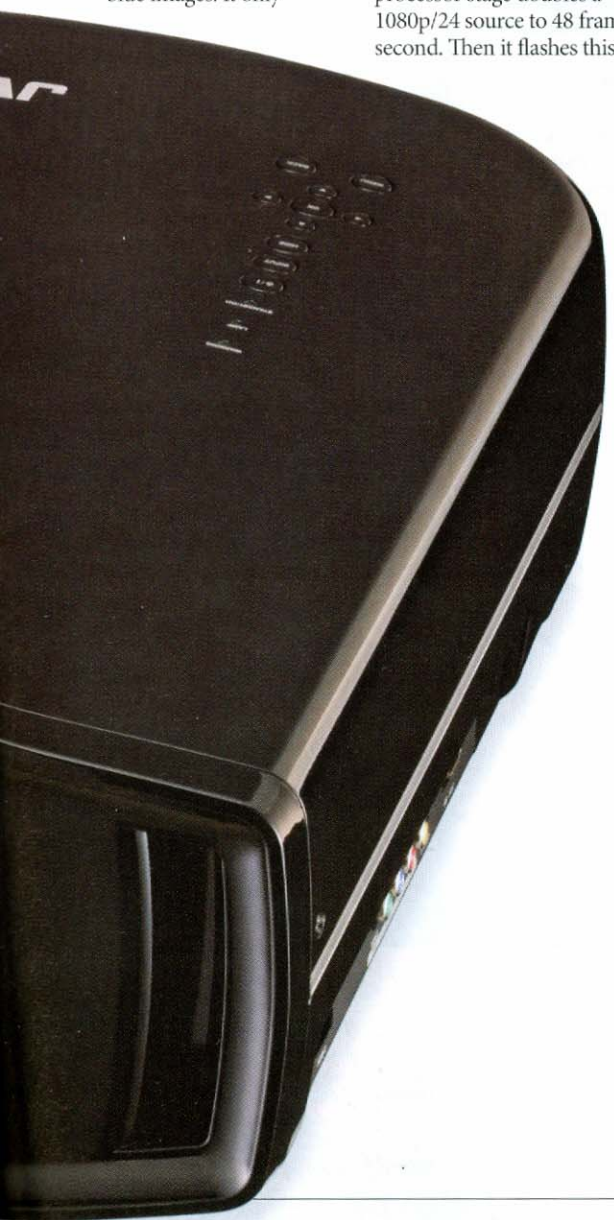
Saturation, and Brightness for each primary and secondary color.

JVC's projector features five preset and three custom Gamma settings. The Custom menu also lets you tweak the overall gamma using an onscreen graphic, as well as the individual red, green, and blue gammas. You should leave the latter alone unless you have the necessary skills and tools; I never needed to adjust them.

The projector also includes Pixel Adjust for fine-tuning the alignment of the red, green, and blue images. It only operates in single-pixel steps. This makes it useful for gross errors, but it's of little use if the convergence is off by less than a pixel.

It also has two lamp settings (Normal and High), two types of Sharpness adjustments, and three types of Noise Reduction (SD sources only). Plus, it includes Color Transient Improvement (CTI, SD sources only) and a manually adjustable lens aperture (iris). If you choose to add an anamorphic lens for use with a 2.35:1 projection screen, the JVC can process the image with its V-stretch control.

The projector incorporates JVC's 120Hz Clear Motion Drive, a selectable 120-hertz feature designed to produce smoother motion. When 120Hz Clear Motion Drive is off, the JVC's processor stage doubles a 1080p/24 source to 48 frames per second. Then it flashes this 48-fps result on the screen twice, for an effective on-screen refresh rate of 96 Hz. If you turn on 120Hz Clear Motion Drive, it will interpolate rather than just repeat the required added frames to reach the effective refresh rate of 120 Hz. With a 1080p/60 source (or a lower-resolution source that's first upconverted and/or deinterlaced to 1080p/60), it flashes each frame twice to reach a 120-Hz refresh rate. It will either repeat the extra frame (120Hz Clear Motion Drive off) or interpolate it (120Hz Clear Motion Drive on).



● The JVC's motorized lens adjustments include focus, zoom, and horizontal and vertical shift.

For those who are wondering if the 120Hz refresh rate makes this projector compatible with 3D, the answer is no.

While you can dial in different settings for each picture mode, you can't adjust the picture controls in a given mode differently for each input. The settings for a given mode are global across all inputs. The DLA-HD950 also has Day and Night ISF picture modes; these options will appear in the selection menu only after setup by an ISF-trained calibrator.

Fun and Games with THX

The DLA-HD950 is THX certified, so it's required to meet certain THX requirements for a good picture. One of the nine picture modes is THX. This mode locks out several of the features that I mentioned above. You're restricted to the 6500K Color Temperature setting, the CMS is inaccessible, and the gamma is fixed, without any selectable options. The fixed THX gamma averaged a bit low at less than 2.1, but it nearly always looked right.

With these restrictions, why would you select the THX mode at all? Because it produces the most accurate out-of-the-box color gamut, and it possibly eliminates the need to dive into the complexities of the CMS. The THX mode's color gamut in our sample was close to ideal.

However, one significant problem with the THX mode is that the fixed color temperature of 6500K was more than 7000K. This is significantly different from the D65 standard. But there is a way for a calibrator to adjust the THX mode with help from the service menu and end up with an excellent result. For more details on this, see HT Labs Measures.

Firing It Up

The JVC employs HQV Reon-VX video processing. Its SD 480i-to-1080p deinterlacing/upconversion and HD 1080i-to-1080p deinterlacing were good, but they weren't quite pristine. The DLA-HD950 had problems passing our 2:2 pulldown tests with both SD and HD sources. It also had some difficulty maintaining a solid lock in our SD 3:2 pulldown test over HDMI. To sort this out, I ran it through the most difficult 3:2 test I know of: the ship's rails and superstructure in the original DVD release of *Titanic*. It passed this test with only a few hard-to-spot jaggies.

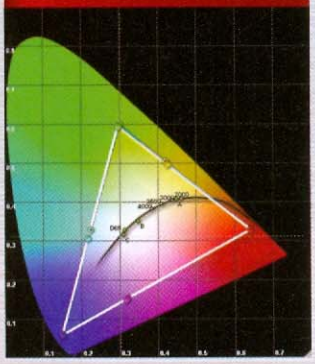
The projector also passed above-white and below-black information, but it only does this if you set the HDMI Input control

Features

JVC DLA-HD950 D-ILA PROJECTOR

TYPE: D-ILA, three chip
NATIVE RESOLUTION: 1920 by 1080
RATED LAMP LIFE: 3,000 hours (Normal Lamp Power mode, estimated)
DYNAMIC IRIS: No
LENS SHIFT: Horizontal/Vertical
DIMENSIONS (W X H X D, INCHES): 14.4 x 6.6 x 18.8
WEIGHT (POUNDS): 24.7
PRICE: $8,000 (replacement lamp: $399)

HT Labs Measures



JVC DLA-HD950 D-ILA PROJECTOR

0.0013	16.19

FULL-ON/FULL-OFF CONTRAST RATIO: 12,454:1

For the picture settings used in this review, go to HomeTheaterMag.com. All of the measurements were taken with the projector in the THX Picture mode, calibrated and adjusted for the most accurate image. For the above contrast ratio reading, the Lamp Power was in Normal, and the Lens Aperture (iris) was set to –10. The screen was a 78-inch-wide, Stewart Filmscreen Studiotek 130 with a gain of 1.3.

Visit our Website for a detailed explanation of our testing regimen, plus a list of our reference gear.

on the web

The full-on/full-off contrast ratio above isn't the best we've seen from a JVC. However, it's still one of the best we have measured from any projector. At these measured black levels, tiny QC variations in the optical path can move the measured results the ten-thousandths of a foot-lambert we're talking about. This fact may justify the extra cost of JVC's supposedly hand-selected DLA-HD990 D-ILA projector, which we have not tested.

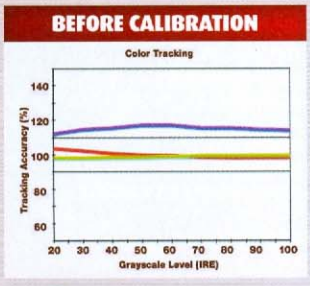
With the iris set at –6, the peak white level was 19.63 ft-L, the black level was 0.0017 ft-L, and the full-on/full-off contrast ratio was 11,759:1. With the iris set at 0, the peak output was 23.34 ft-L, which increased to 32.7 ft-L with the Lamp Power on High.

The post-calibration color, as shown in the Color Tracking and CIE charts (both for the THX picture mode), is nearly beyond criticism and very close to the Rec. 709 color standard. But it required a rather convoluted calibration procedure to get there, since there are no user gray-scale adjustments in the THX mode. What should a calibrator do? First, select any other picture mode, such as Natural (which one you choose isn't important, as long as it's not THX). Set that mode to a 6500K color temperature. Then, enter the service menu, which offers gain controls (but not Offset) for all the fixed color temperature options (5800K, 6500K, 7500K, and 9300K). After you adjust the gains, you'll need to drop out of the service menu and select the Color Temp adjustments for 6500K in the main menu. This offers offset controls, but not gain. Set the offset there. Then, go back and forth between the two menus until you're satisfied with the result. Once you've done that, the calibrated 6500K will apply across all Picture modes for which 6500K is selected. 6500K is the color temperature that's fixed for the THX mode, so the THX mode will also be calibrated as well!

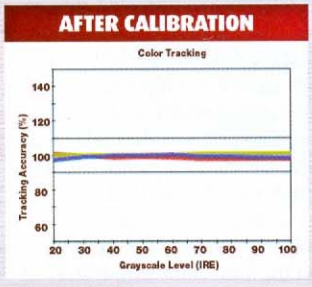
If this procedure sounds convoluted, it is. It works, but we'd like to see JVC offer convenient gray-scale adjustments for the THX mode, even if they're in the service menu.

I used the THX mode for this review because its fixed color gamut (see the CIE chart above) is the most accurate. The projector's color management system (CMS, which is available in the other modes, but not the THX mode's main menu) offers a wide range of color gamut adjustments. Like all full-featured CMS systems this one is most effective when used with advanced calibration software. In our sample, the THX mode's color gamut out of the box was so close to spec that the need to engage the CMS was obviated.—**TJN**

BEFORE CALIBRATION



AFTER CALIBRATION



Color-tracking charts were generated in Datacolor ColorFacts.

Connections **INPUTS: VIDEO:** HDMI 1.3 (2), component video (1), S-video (1), composite video (1), PC (D-sub 15-pin, 1), 12-volt trigger (1) **ADDITIONAL:** RS-232 (1)

to Enhanced. For additional video processing results, see the Video Test Bench chart.

JVC's 120Hz Clear Motion Drive worked as I expected. It provided smoother motion, with a video-like look on film-based material. This result is common to all motion compensation that's based on frame interpolation. I didn't use it for any of my serious viewing.

The convergence of the red, green, and blue color panels in our review sample was excellent out of the box. It wasn't perfect, but it was close enough so that any errors were unnoticeable at a normal viewing distance.

The DLA-HD950 is the quietest JVC I've tested; it's almost silent in its Normal Lamp Power setting. In the High setting, the fan is clearly audible in a quiet room, but it's not obtrusive, particularly with sound playing.

From fleshtones to greens and everything in between, I never had any complaint about the JVC's color performance, either subjectively or objectively. It didn't put a visible foot wrong, a quality that all of my measurements confirmed. I've been impressed by the overall performance of every JVC projector I've seen since the DLA-RS1 debuted three years ago. Still, in the past, color hasn't been their strong suit, either from insufficient controls (gray scale in the DLA-HD1 and DLA-RS1) or a too-wide and nonadjustable color gamut. This is the first time I've found nothing to criticize in a JVC's color performance.

JVC's self-illuminating remote control lets you conveniently select any of the projector's nine picture modes.

Surprisingly, the DLA-HD950 didn't exceed the best black levels we've measured on earlier JVCs. When I calibrated it for the most accurate picture, it didn't reach the company's claimed but highly optimistic contrast ratio. In fact, some previous JVCs that have passed through our doors have measured better than the DLA-HD950, but not by much.

This is still an impressive beast. Its black level and shadow detail are subjectively equal to or better than any other projector I've reviewed—or seen. Some earlier JVCs had slightly lighter corners that mildly detracted from their pristine blacks at the center of the screen. But the DLA-HD950 looks uniformly dark everywhere when an image fades to black. When black bars show up, they don't disappear as they often do on a Pioneer KURO plasma in a darkened room, but I can't name a projector that can do better. Like earlier JVCs, the DLA-HD950 also does all of this without the aid of a dynamic iris or dynamic contrast control.

The projector's adjustable but fixed lens aperture (iris) lets you find the right brightness level for

3:2 HD	2:2 HD	MA HD	VIDEO CLIPPING	LUMA RESOLUTION	CHROMA RESOLUTION	SCALING
PASS	FAIL	PASS	PASS	PASS	PASS	GOOD

your screen and taste. My screen is relatively small (a 78-inch-wide, Stewart Studiotek 130 with a gain of 1.3). At an iris setting of –6 and 160 hours on the projector and lamp, I measured a peak white level that was comparable to my older DLA-RS1's output on the same screen with 625 hours on its original lamp. While I did most of my viewing of the DLA-HD950 at that –6 iris setting (the DLA-RS1 has spoiled me for a dimmer picture), you can easily reduce the iris setting and gain marginally darker blacks in the bargain. (The control ranges from 0 at peak output to –15.) This ample brightness also makes the JVC suitable for a considerably larger screen. You'll also get an added punch if you switch to the High lamp setting. More on that in HT Labs Measures.

The JVC isn't as jaw-droppingly crisp as many single-chip DLP projectors, but it's as sharp as any LCD or LCOS projector we've tested. It's as sharp and detailed as I could want. I would call it more filmlike than DLPs, or more like analog video than digital.

on the web

For additional details, plus a list of the settings used for this review, see the online version.

However, those descriptions might give you the impression that the projector is soft, even in a subtle way. It most certainly is not. The details are all there, from craggy facial textures to the finest pixel strokes in your favorite computer-animated film.

Trek-in with JVC

Star Trek (2009) is a spectacular Blu-ray transfer, and the JVC didn't fail it in any way. The colors in the source material are only a little stylized, and the projector got them right. In fact, it got them as close as it's possible to determine without sitting next to the colorist in the mastering studio. It has plenty of detail as well, but the capper is the effortless way the JVC handled this very dark movie. For me, the opening sequence is the most compelling and moving scene in the film. The JVC's presentation of the inkiness of space behind the dark Romulan ship made the scene real in a way that lesser projectors can't match.

Braveheart is a very different animal. The JVC performed beautifully in its dark scenes, but the thrilling detail in this movie's brighter sequences really pulled me in. The long and medium shots of the English and Scottish armies, massed for the Stirling and Falkirk battles, are brilliantly resolved on this Blu-ray Disc, and there wasn't a trace of softness in the way the JVC handled it all.

In a way, *9* (the post-apocalyptic, zippered sock-puppet movie, not the recent misguided musical) has a little of everything. Yes, it's computer-animated Blu-ray, and computer animation has a way of looking impressive on most displays. But the animation is very different and far darker than usual. So is the movie, which is *not* for young children, who will find parts of it terrifying. However, the animation is exceptional, and the rich details, subdued but clear color, and dark shades and shadows all looked spectacular.

Conclusions

A few similarly priced designs can approach but not improve upon JVC's current line of projectors. What can JVC's intrepid projection design team do to move the bar upward? I would add a blue-only mode, full gray-scale control for the THX mode (even if it's in a service menu), and gamma options in THX. These would be obvious baby steps that don't require a major redesign. Finer adjustment of panel convergence would also be a welcome step up.

But 3D appears to be the top banana this year, and I wouldn't be surprised to see it in JVC's future plans. LED lighting and perhaps higher resolution (JVC does have a 4k chip in its inventory, after all) may be in there somewhere as well, but 3D will be a more marketable commodity in the near future.

There's always something new over the hill. Whatever the next year may bring, any changes will likely be in new features and in the performance margins. The fundamental performance of JVC's current DLA projectors and the value they offer are unlikely to be significantly better any time soon, by anyone. The DLA-HD950 gets our highest recommendation.

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