

Test Bench

BY Thomas J. Norton

DreamVision StarLight1 LCOS Projector

PRICE: \$6,995 (optional Schneider Optics lens: \$7,995) **AT A GLANCE:** Big, bright, punchy image
 • Black level and shadow detail compete with the best • Excessively wide color gamut

Broaden Your Horizons



If you've investigated the subject of constant-height projection, you know that it can be a complicated, slightly intimidating business. We covered the ground rather thoroughly in "Beating the Black Bars" (*HT*, October 2008). Constant-height display generally involves placing a so-called anamorphic lens in front of a projector's native lens when viewing true widescreen films—that is, films with an aspect ratio of around 2.35:1 (often called scope films). Such a setup also employs a 2.35:1 screen. For material with an aspect ratio of 1.85:1 or less, the lens is normally moved out of the way and the image is projected onto the 2.35:1 screen with black bars on each side. This is sometimes called windowboxing.

DreamVision uses a variation on this theme. It leaves the anamorphic lens in place at all times and processes both scope and conventional sources to produce a properly proportioned image with all program material. This eliminates the need for an expensive mechanism to move the anamorphic lens out of the way when it isn't needed.

The Basics

There are three projectors in the StarLight line. All of them are based on the 2010 range of JVC LCOS projectors, and the performance and basic features appear to be the same for the equivalent StarLight/JVC models. But the aesthetics are different. The StarLight1 has a larger, curvier case (available in black or white), a more deeply recessed lens, and no automated lens cover.

The StarLight1 offers motorized zoom, focus, and shift (left-right and up-down). The

available throw distances from this lens on a 100-inch-diagonal 16:9 screen (87 inches wide), from the screen to the front of the lens, are approximately 9.9 to 20 feet.

The projector offers the usual set of inputs, including two HDMI 1.3 connections. They are located on the side. This might be awkward for some installations, but it lets you place the projector nearly flush with the back wall of the room if needed.

There are eight Picture Modes, a wide range of Gamma settings, and eight Color Temperature selections, including three Custom options that offer individual Gain (high) and Offset (low) adjustments for red, green, and blue. Unlike the more upscale StarLight models, the StarLight1 lacks a color management system that can move the locations of the red, green, and blue color points to achieve an accurate color gamut.

To address a complex subject as briefly as possible for new readers, white balance and color gamut are two different issues. Both must be correct to achieve truly accurate colors.

There are two forms of Sharpness controls: Sharpness and Detail Enhancement. I found that they both worked best when they weren't working at all—at or near their minimum values—although their effects were relatively subtle at lower settings. Three multistep noise-reduction controls and a three-position Color Transient Improvement (CTI) control (said to reduce color smear) are active only with standard-definition sources. I left all of these adjustments off as well.

The StarLight1 offers 120-hertz operation with frame interpolation in a feature that DreamVision calls Crystal Motion Drive. This process is popular in many

DREAMVISION STARLIGHT1
 LCOS PROJECTOR
PERFORMANCE ★★★★★
FEATURES ★★★★★
ERGONOMICS ★★★★★
VALUE ★★★★★

modern displays under a variety of names. It produces smoother motion that pleases some viewers. But while it can be helpful on video-based sources, it produces a too-fluid look on movies that others, like me, don't like at all.

With Crystal Motion Drive off (which is where I left it), the StarLight1 simply repeats a 24-fps source three times for a refresh rate of 96 Hz. It repeats a 60-fps source once for a 120-Hz refresh.

Considering its origin, I wasn't surprised to find that the StarLight1 has exceptional blacks without the use of any form of dynamic iris. Nor does it achieve these blacks by sacrificing peak



SPECS

DREAMVISION STARLIGHT1 LCOS PROJECTOR

TYPE: Three-chip LCOS
NATIVE RESOLUTION: 1920 by 1080
3D: No
RATED LAMP LIFE: 3,000 hours
LENS SHIFT: Horizontal/Vertical
DIMENSIONS (W X H X D, INCHES):
 15.2 x 7.8 x 19.7
WEIGHT (POUNDS): 33.5
PRICE: \$6,995 (replacement lamp: \$650)

light output. This is a very bright projector in its High Lamp Power mode, and it's brighter than most even in its Normal setting. If needed, you can taper off the peak brightness level with one of three fixed Lens Aperture (iris) settings. Setting 3 is wide open. In setting 2, I measured a 25-percent light reduction, and in 1 (minimum), the brightness dropped a total of 45 percent from a fully open iris. I'd prefer a wider range of aperture adjustments (the other StarLight models offer 16). But the combination of two lamp settings, Normal and High, and three Lens Aperture positions should satisfy most users on most screens.

The StarLight1 is quiet. With the Lamp Power on Normal, you can hardly hear it at all unless your ears are within a foot or two

• The StarLight1's large, curvy case is available in black or white.



of the side exhaust port. The noise is audible in the High setting, but even then, with no sound playing, it wasn't distracting.

A Pixel Adjust feature moves the red, green, or blue components of the image horizontally or vertically by up to seven pixels each. The movements are limited to full pixel steps and can only help with errors of more than a half pixel. Our sample's color alignment wasn't perfect, but the deviations were less than a half pixel and not visible from a reasonable viewing distance.

The StarLight1 uses HQV video processing, and as you can see from the Video Test Bench chart, its processing is solid all around. You need to set the HDMI control to Enhanced to prevent clipping above white.

The onscreen graphic user interface is good, and you can set the controls to remain on until you manually close them (important while doing a calibration), or you can set them to time out. The layout and ergonomics of the fully backlit remote are also excellent.

Schneider-Free

You can use the StarLight1 without an anamorphic lens, and that's how I began my viewing tests. I set the basic picture controls as accurately as possible but saved a full calibration for the anamorphic setup.

I used the DreamVision on the same 118-inch-wide, Stewart StudioTek 130 G3 projection screen (gain 1.3) that was in house for a report on the Digital Projection TITAN 3D projector (see page 24). I didn't expect much punch from the StarLight1 on a screen this big, and I was ready to zoom down the image to achieve a reasonable brightness, if needed.

Was I ever surprised. Even on the full-screen width, the picture from the StarLight1 was gorgeous. In the Normal lamp mode (100 hours on the lamp) with the lens aperture fully open, it produced over 11.5 foot-lamberts. The High lamp mode increased this to over 16.5 ft-L. The black level was equally impressive in both lamp settings, at 0.001 ft-L.

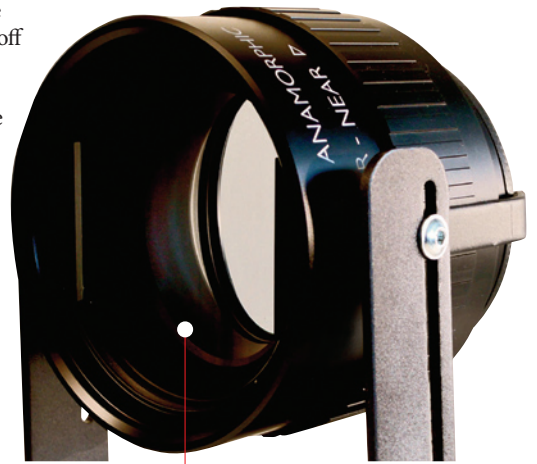
The picture was outstanding in all respects. I preferred the High lamp setting. I like a bright image—as long as the black level

is good. The picture practically jumped off the screen, with outstanding detail and good color. The projector clearly revealed scene-to-scene differences in the photographic quality of many films, but this was rarely distracting. Film grain was visible when it should be, and its absence was clearly evident on movies that were shot with video cameras—or created with a computer. *Kung Fu Panda* is one of the slickest, sharpest, and most colorful computer-generated films of this past decade, and the StarLight1 produced a level of big-screen eye candy that you don't expect to see at this price. *Baraka* did the same for live action. While made-for-TV series are seldom as carefully photographed as a good theatrical production, seeing *Lost* from this projector on a 118-inch-wide screen was nevertheless a memorable experience.

Anamorphia

Next, I moved on to the task of fastening the optional Schneider Optics Cine-Digital 1.33X anamorphic lens (\$7,995) onto the StarLight1. The mounting bracket that comes with the lens kit looks simple enough, but the operation isn't ideal for the all-thumbed enthusiast. There are only a few adjustments, but the lens setup manual misstates at least one of them when it implies that the bracket can be moved from left to right; it can't. It also fails to emphasize the correct orientation of the lens; the oval aperture visible when you look through it must be vertical.

One of the three screws that secure the lens to the bracket would not tighten. A second screw required so much force that I was concerned I might have stripped the threads. Apparently I hadn't, and the lens was ultimately secured with three of its four mounting screws. For all of these reasons, not to mention simply handling an \$8,000 piece of glass and using a screwdriver within millimeters of the unprotected



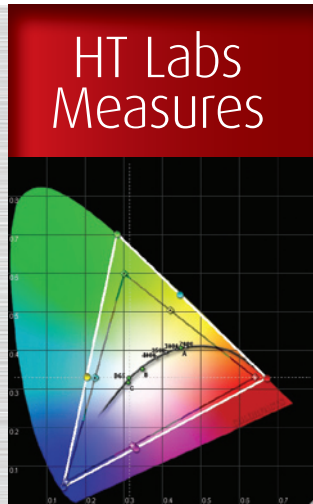
• The Schneider Optics lens produced very few anamorphic artifacts in Tom's testing.

rear element, it was more than a little intimidating. This is something your DreamVision dealer or installer will handle for any potential buyers. A dealer with experience in anamorphic projection should also be better able to deal with other factors such as throw distance and projector-screen alignment, both of which can be more critical than in conventional setups.

When a 2.35:1 film is transferred to disc, many of the pixels are used up in the black bars. When you play back such source material in an anamorphic setup, the image is first stretched vertically so that it uses all of the pixels available on the imaging chips. In the StarLight models, the projector performs this vertical stretch electronically. The anamorphic lens then horizontally uncompresses this vertically elongated image. Voilà. A 2.35:1 image that fills a 2.35:1 screen with no black bars.

But you don't really need an anamorphic lens to use a 2.35:1 screen. You can simply adjust the lens' zoom, focus, and perhaps vertical shift as needed to match the source. This is a little tedious, but it can work, particularly with a projector like the StarLight1. With all of its automated lens features, the changeover should take no more than five minutes. And the StarLight1's blacks are so good that the black bars on a 2.35:1 transfer shouldn't be distracting when they spill off above and below the active screen

MIDRANGE DREAMVISION STARLIGHT1 LCOS PROJECTOR



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0.0016 18.55

FULL-ON/FULL-OFF CONTRAST RATIO: 11,465:1

Unless noted otherwise, all measurements were taken in User Picture Mode, with the anamorphic lens in place, a full anamorphic stretch engaged (Aspect 16:9, V-Stretch on), the lamp in its High setting, and the aperture (iris) fully open (3). The screen was a 118-inch-wide, Stewart StudioTek 130 G3, which is substantially larger than the screen used for most of our projector reviews. The throw distance was also substantially longer than usual, which put the lens zoom range near its minimum setting. These differences will affect attempts to directly compare the white and black levels reported here with those in most of our other projector reviews. For the picture settings used in this review, go to HomeTheaterMag.com.

The full-on/full-off contrast ratio above (which is sometimes referred to as the peak contrast ratio, the sequential contrast ratio, or the dynamic range) is superb and among the best we've measured. In the Normal Lamp Power setting, the peak white level dropped to a still impressive 14.05 foot-lamberts, and

the black level was 0.0017 ft-L (essentially the same, given typical measurement variations).

The Color Tracking charts show how closely the StarLight1 adheres to the standard D65 white point; the tighter the overlap of the three primary colors, the nearer the result is to D65. The Before Calibration curve was taken with the projector in its Normal lamp mode with the projector on its 6500K Color Temperature setting, just as you might use it straight out of the box. The After Calibration setting is fully calibrated, but this time in the High lamp setting.

The Delta E in the After Calibration result was 2.6 or less (mostly less) from 30 IRE (dark) to 90 IRE (near peak white), 1.1 at 20 IRE (very dark), and a maximum of 3.75 at 100 IRE (peak white). (Delta E is a figure of merit that indicates how closely the result is to the ideal white point of D65. Below 4 is good, and below 3 is generally considered visibly indistinguishable from a perfect result.)

An After calibration result was also captured in the Normal Lamp Power setting. While not shown here, the results were marginally better than in the already impressive High setting.

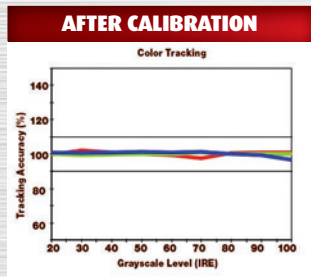
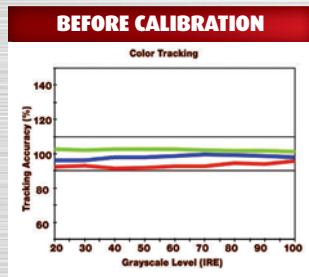
Visit our Website for a detailed explanation of our testing regimen, plus a list of our reference gear.



A change of lamp mode alters the color temperature and requires a separate calibration. That's what we did, with User 1 set up for Normal Lamp Power and User 2 for High. This made it easy to shift back and forth as needed by simply switching to the appropriate User setting and changing the Lamp Power separately—Lamp Power is not memorized in the User modes.

The pie-shaped CIE chart clearly shows the StarLight1's oversaturated color gamut. The correct color gamut (Rec. 709) is shown by the black triangle. Unlike the higher-end StarLights, the StarLight1 has no color management system for reining in this gamut. The result is not accurate color, but it was not unnatural looking, and most viewers will be unlikely to notice anything amiss if the color tracking (gray scale) is calibrated.

—TJN



Charts and measurements generated using CalMAN by SpectraCal



CONNECTIONS INPUTS: VIDEO: HDMI 1.3 (2), component video (1), S-video (1), composite video (1) ADDITIONAL: RS-232C (1)

area—as they would be on a projector with a high black level.

Nevertheless, there are benefits to the full anamorphic setup. Convenience is one. Even more significant is an increase in brightness with a 2.35:1 widescreen source. When the image is stretched to use all of the available pixels, more light passes through the imaging chips and thus through the lens. This more than makes up for light lost to the extra glass elements. By our measurements, the overall brightness in the anamorphic configuration is increased by 15 to 20 percent when compared with the zooming method.

Note that stretching the picture vertically to fill all of the available pixels doesn't increase the actual resolution you see on the screen. The 2.35:1 source on the disc still has black bars, and stretching it vertically can't add information that wasn't there in the first place. It merely maps the same number of source pixels onto more display pixels. It would be possible to master the disc itself with an inherent stretch, so that the real information is present in the area that's currently wasted by the black bars in 2.35:1 transfers. But then the discs would be incompatible with the playback gear of the 99.99 percent of viewers who lack anamorphic setups. Ain't gonna happen.

Our measurements show that the actual displayed gamma is considerably lower than the gamma indicated by the projector's Gamma setting. In the Normal lamp mode, a Gamma setting of 2.2 produced a measured average gamma of 1.86. This sounds alarmingly low (recommended playback gammas generally range from 2.2 to 2.4), but it didn't look that way at all. When I increased the Gamma

setting to 2.6 (which by interpolation would appear to then give a real value closer to 2.3), the picture looked drab.

I ultimately settled on a Gamma setting of 2.4 and, as before, the High lamp setting. This produced the best picture even though the actual gamma was lower than 2.4. I briefly tried the projector's custom gamma feature, which gives you control over the light output at individual steps across the brightness range (including not only white gamma, but red, green, and blue as well). This process is extremely tedious, and you need the right test tools to do it.

The only anamorphic artifact I noticed was a pale white shadow below white titles on a black background (lens flare, perhaps). It was subtle but visible on stationary titles, but it was more obvious on scrolling titles. With one exception (a vertical pan), I never spotted this on more complex images. I attempted several adjustments to the lens' position and orientation, as DreamVision suggested, but I was never able to eliminate the artifact. It's entirely possible that an installer who's experienced in such setups could do better. In any case, I didn't consider the issue a deal breaker. The picture was just too good in all other respects.

Let's Get Wider

Pirates of the Caribbean: The Curse of the Black Pearl is a great Blu-ray transfer, and the scenes that run from the arrival of Jack Sparrow in Port Royal to his rescue of Elizabeth is a primo reference sequence. The detail, particularly in the period costumes and sets, was incredible on the StarLight1. The colors were also hard to fault.

In its High lamp setting, the StarLight1 with the Schneider lens

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

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produced a peak white level of over 18 ft-L on the 118-inch-wide screen, and *Pirates* was as sharply detailed as I've ever seen it. In fact, I've never seen it look better overall. It absolutely blew me out of the water.

The darker scenes in *Pirates* appeared a little grainy, but any thoughts that this might indicate a weakness in the projector or lens were dispelled as soon as I put on *Harry Potter and the Half-Blood Prince*. Dark, disturbing scenes dominate this movie. I don't think there's a single shot in bright sunlight; even the opening daylight scenes are overcast. But the StarLight1 sailed through it all. For example, Harry's late-night return to Hogwarts is deeply shadowed and moody, but nothing looked muddled, blotchy, or washed out. Later, Harry ends up knee-deep in a bog near the Weasley house—another



Tom gave the remote good marks for its logical layout and full backlighting.

gray-to-black night scene that I can only describe as a horror show for video displays. It was child's play for the StarLight1.

When I first popped on the *Potter* disc, I was horrified at how soft everything looked. Had something gone wrong? No, it hadn't. The *Potter* set includes both Blu-ray and DVD versions of the film, and in the darkness I had accidentally pulled out the DVD. Yes, it was watchable, but don't let anyone tell you that Blu-ray is only a small improvement over DVD. It's huge—particularly when you view it on a great projector and a really big screen.

One downside to a fixed (as compared to a movable) anamorphic lens is that for a standard-aspect source (1.85:1 and smaller), the processing must perform a horizontal squeeze (to compensate for the lens' opposite effect). To do this, you must set the projector's aspect to 4:3 and turn

off the V-Stretch control. But the squeeze that the 4:3 setting produces eliminates 25 percent of the horizontal resolution. For example, for a 1920-by-1080 source, the effective resolution on the screen becomes 1440 by 1080.

When I took a careful look at familiar standard-aspect, high-definition program material with the anamorphic lens in place, it suggested a softening of very fine detail from this reduction in resolution. Most viewers will never notice it. *Avatar* was jaw-dropping in a 2.35:1 aspect playback. (This did require cropping the top and bottom of the picture, but many theaters ran it that way.) It had perhaps a little less magic (picture quality wise) in 1.85:1, the disc's native aspect ratio. How much of that was due to the smaller, narrower image and how much to the loss of resolution is hard to say. It still looked very good. Nevertheless, a movable anamorphic lens (instead of a fixed one) will get the best out of less than the widest sources.

The compromise was small, but if you're a serious videophile, you'll want to check out a fixed-lens setup before you decide whether to go the fixed or movable route.

Conclusions

The StarLight1 commands a premium above the \$5,500 price of the equivalent JVC projector. This can't be ignored. Dream-Vision's \$650 lamp replacement cost also seems rather steep. But only you can decide if the StarLight1's upscale aesthetics—and the potential for more personalized setup, service, and integration that DreamVision's dealer network aims to provide—justifies the added cost.

I began this review just days after I'd spent time with the Digital Projection TITAN, an \$85,000, pro-oriented, 3D-capable three-chip DLP projector. Was the pricey DLP better? In many ways, yes, although its blacks were definitely inferior. Apart from the DLP's incredible 3D performance, did I feel deprived as I moved on to the 2D StarLight1, either with or without the Schneider lens? Not at all. I experienced no withdrawal pains whatsoever. In fact, I never looked back. ☺

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