CHEAP THRILLS

PLUS Piano HE-3100 Tabletop DLP Projector

found at Chili's or T.G.I. Friday's or wherever, but for less money. It was with much the same anticipation that I looked upon PLUS Corporation's announcement that they would market a $3,000 DLP projector, dubbed the Piano. Since most home-theater-based DLP projectors, like the ones in our recent Face Off (October 2001), cost around $10,000, $3,000 seemed like a pretty tasty deal.

I'm sure that many cynics are already fiercely tapping away at their keyboards, eager to e-mail me about the number of inexpensive business projectors available that are undoubtedly as good as—and less expensive than—their home theater counterparts. PLUS normally makes these kinds of presentation projectors, which corporate salespeople use as portable monitors for their PowerPoint presentations. However, until now, I've found that the vast majority of these projectors lack significant features that are necessary for home theater use.

A. The tiny HE-3100 projector works in a front- or rear-firing position and can be mounted on the floor or ceiling.

B. The back panel features component, S-video, and composite inputs, as well as a DVI-D digital input for connection to a computer.

The Piano HE-3100 utilizes Texas Instruments' latest DMD dual-mode chip. This display uses an 848:600 mirror array to create the image, which (for anyone without a calculator) comes out to a 1.41:1 aspect ratio. Why the weird aspect ratio? A typical SVGA chip (800:600) has to scale widescreen, 480-line NTSC images down to 450 lines (800:450) to fit the chip's 16:9 area. On the HE-3100, the same image uses 848 by 480 pixels, which requires no scaling. Standard 4:3 images can still use the 800:600 array, so computer images don't have to be scaled, either. It's a great compromise.

Speaking of compromises, PLUS made few when they added scaling to this display. Surprising at this price point, the projector uses Silicon Image's excellent Sil 503 deinterlacer. This processor (the same one used in the iScan line doubler) employs excellent 3:2-pulldown detection to convert 480i images into 480p without motion artifacts or jagged edges. This is a feature you rarely see in presentation displays. A progressive-scan DVD player may offer a sharper picture, but it doesn't have any fewer motion artifacts. The projector does introduce minor scaling anomalies in the 16:9 mode; however, for the money, it does an excellent job of handling both film and video images.

The sandwich-sized HE-3100 handles any NTSC home theater source. It's stacked with good fixings like composite, S-video, and component (Y/Pb/Pr) inputs, so it can accept nearly any connection, although you may need an external switcher. The HE-3100 shows its presentation roots with its DVI-D input, which provides a purely digital connection to a computer. Other than the detachable power cord, that's about it. Of course, PLUS could not have fit much else on this tiny unit. After all, you could stack the projector on top of your cable box and still have room for your soda.

HIGHLIGHTS

- **3:2 pulldown eliminates motion artifacts and jagged edges**
- **848:480 resolution is perfect for 16:9 DVDs**
- **Almost dirt-cheap**

Neither the component nor the DVI-D input accepts 1080i or 720p HDTV signals. While this might normally force us to dismiss the display, 480p can look pretty good and is as much as the HE-3100's chip can handle anyway. The best DLP displays to date only output 576p. At the 2001 CEDIA expo, several manufacturers announced plans for true HD-ready DLPs with 720p arrays, but these cost $12,000 or more. For those of you who live in TV markets that don't have a lot of broadcast HD material, the PLUS projector is a viable option.

Being effectively illiterate (i.e., we're too lazy to read an owner's

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manual), technical consultant Ron Williams, associate editor Geoffrey Morrison, and I stared at the unit for about 10 minutes before we figured out how to turn it on. You have to hold down the power button for a few seconds. Other than that, the remote and projector are easy to set up. The necessary home theater adjustments, such as gray scale and gamma, are included. Gamma adjustment is important, as computers and home theater setups use distinctly different gamma curves. When you watch video images on a computer display, medium-intensity images seem too bright, relative to darker and lighter images. The Piano projector's gamma matches exactly with the needs for video, but it has alternate modes for a computer. Only projectors that cost three times as much, from companies like Sèleco and Runco, offer this feature.

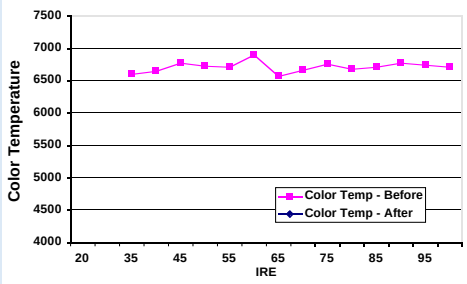
C. The HE-3100's remote is easy to set up and use.

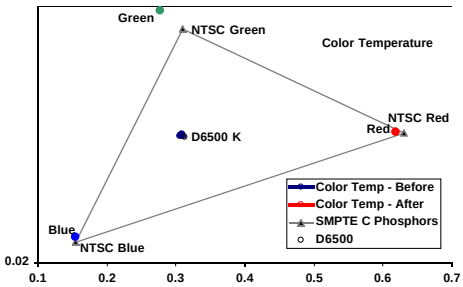
Installation is easy and reasonably flexible. The unit works in front- and rear-firing, floor- and ceiling-mounted positions. In our front-firing, floor-mounted position, the projector sits low to the screen. This would be an advantage in a ceiling-mounted installation, as it gets the projector up and out of the way. Since the projector uses a fixed-throw lens, you have to have some placement flexibility. There's no zoom control, which means you have to move the projector itself forward and backward until the image fills the screen.

The HE-3100's aspect-ratio control is also slightly limited, flavored prominently for 16:9 DVD tastes. The projector offers both an anamorphic and a 4:3 mode. The large 4:3 (full) setting is the best option for nonanamorphic letterboxed images, although it doesn't quite fill the screen. Then again, neither does the 16:9 (LB) setting, which for some reason is slightly smaller than the full setting. You can slide the projector forward or back, if you prefer. Using a large 4:3 screen won't, of course, let you take advantage of the dual-mode chip. Subsequently, the projector lacks a 16:9 mode for this type of setup. You might consider a 1.42:1-shaped screen, though. While this screen shape may be unorthodox, 4:3 images would fill top to bottom and 16:9 images would fill left to right. Nonanamorphic letterboxed movies still wouldn't fill the screen.

The projector's manual focus works well, however, and helps produce a really sharp picture. The image from the different video inputs varies. For instance, the composite input noticeably softens the image. This input's comb filter doesn't remove dot crawl any better than many outboard comb filters do, but it uses an extremely accurate color decoder, which helps make the image as colorful as possible. Both the S-video and component inputs preserve more of the source material's detail, and the component signals feature their trademark improvement in color detail. I recommend you use the S-video or component connections whenever possible.

Using these connections, my typical demo DVDs appeared naturally colored and reasonably bright. *The Fifth Element*'s colorful antagonist stood out against the futuristic traffic landscape, while





HT Labs Measures: PLUS Piano HE-3100 Tabletop DLP Projector
The top chart shows the gray scale of the PLUS DLP projector relative to its color temperature at various levels of intensity, or brightness (20 IRE is dark gray; 95 IRE is bright white). As you can see, the gray scale as set by the factory, in the most accurate menu setting, measures within 300 to 400 degrees of the industry standard of D6500 Kelvin across the entire range. The bottom chart shows the gray scale (or color temperature) relative to the color points of the display's red, green, and blue color-wheel filters. The color points, which are typical of presentation displays, are reasonably close to those specified by SMPTE for NTSC displays, which means the display will reproduce nearly all of the colors available in the system. The gray scale appears as the smudge near the center of the diagram, indicating that it doesn't drift too much toward any one color. The light output was approximately 3 foot-lamberts on a 7-foot-wide Stewart Grayhawk screen. We measured 10 ft-L on a 4.5-foot-wide Da-Lite VideoVision rear-projection screen. The display has good DC restoration and an accurate color decoder. It displays about 400 horizontal lines (per picture height) with composite NTSC sources and 440 lines with Y/C or component connections when viewed with images from a test DVD and the Marantz DV7100 DVD player.—*MW*

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Braveheart's lush backdrop made me want to visit the Scottish Isles. Much of this color saturation is due to the HE-3100's six-segment, RGB-only color wheel (and that it only has to live up to NTSC standards). While presentation projectors often substitute clear elements between the RGB filters to boost brightness, this technique robs color richness. The HE-3100's only constraint is a somewhat limited light output. While the images don't offer the depth and contrast of those produced by brighter projectors, they were sufficient to light a 7-foot-wide, negative-gain Stewart Grayhawk screen. A smaller, higher-gain screen proved to be a better choice and made the image really pop. A 5- or 6-foot-wide high-gain screen offers more-cinematic brightness levels.

In the end, I was very happy with the image (more so than I was with the Six-Dollar Burger, I might add). Compared with the competition, the Piano HE-3100 is far cheaper and provides an excellent picture when driven under the right conditions. Try to power a 12-foot-wide screen with composite sources and you'll be extremely disappointed. Illuminate a 6-foot-wide screen using higher-quality connections and you'll have a pleasing but not bank-account-breaking image. PLUS has definitely taken a huge step toward bringing front-projected DLP images to the masses.

Piano HE-3100
Tabletop DLP Projector **$2,999**

PLUS Corporation
(201) 818-2700
www.plus-america.com
Dealer Locator Code PLU