Panasonic PT-AE3000
Home Theater Projector

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Every so often a projector manufacturer takes a mighty swing and hits one way out of the ballpark. Such is the case with this fall's new **Panasonic PT-AE3000**. Panasonic's third generation 1080p home theater projector combines a breathtaking array of features with rich, satisfying image quality, and brings it all to market for an MSRP of $3,499. The AE3000 is one of those new benchmark-setting achievements that will cause the industry to rethink pricing on 1080p projectors. One wonders... how long can some brands continue to ask $10,000 and up for 1080p projectors when you can get stunning, high contrast 1080p picture quality and an unsurpassed boatload of features for street prices close to $3,000?

Specifications

ANSI lumens: 1600

Contrast (full on/off): 60,000:1

Light Engine: 1920x1080, native 16:9, 0.74" LCD with a 165W UHM lamp.

Video Compatibility: 1080p/24/50/60, 1080i, 720p, 576p, 576i, 480p, 480i. NTSC/PAL/SECAM.

Connection Panel: Three HDMI 1.3 ports, one 15-pin VGA input, two sets of 3-RCA YPbPr component video, one composite video, one S-video, one 9-pin D-sub serial (RS-232c).

Lens and Throw Distance: 2.00:1 powered zoom/focus lens, with manual vertical and horizontal lens shift. Throws a 100" diagonal 16:9 image from 10 to 20 feet.

Lamp Life: Unspecified.

Lamp Cost: $400

Warranty: One year.

Key Features and Advantages

In last year's review of the AE2000, we said it had such a long list of unique and noteworthy features that it was hard to know where to start. With the AE3000, that list is even longer. Features that will get the most attention on the AE3000 are much improved contrast, Frame Creation for rendering a smoother image, a rapid frame delivery option for gaming, and Lens Memory for 2.35 screen set-ups.

Contrast. The single most riveting improvement as far as picture quality is concerned is in contrast. The AE3000 delivers **much** higher contrast than the AE2000. We measured the AE2000 at 305:1 ANSI contrast, while the AE3000 jumps to a very impressive 446:1.

Those numbers might not sound very big to you. But ANSI contrast measures the dynamic range potential in a given frame of video, or the actual difference between black and white at the same time. ANSI contrast numbers are always much lower than Full On/Full Off numbers, so they are not typically published in official specifications. In practical terms, a jump from 305:1 to 446:1 means you get a whopping increase in visible contrast on the screen. In fact, 446:1 is the highest ANSI contrast number we've yet measured on an LCD projector, and it brings LCD's ANSI contrast performance very close to the numbers we see on the DLP competition.

Meanwhile, Full On/Off contrast has been improved as well. The AE2000 was rated at 16,000:1, and the AE3000 is rated at 60,000:1. Our contrast measurements confirm that there is indeed a substantial boost in Full On/Off performance in the AE3000. But ultimately, the numbers are meaningless by themselves. It is the combination of black levels, rapid iris action, ANSI contrast and Full On/Off contrast that produces the final impression of snap, sparkle and three-dimensionality on the screen. And the AE3000 has it in spades. When set side by side with the AE2000, the AE3000's blacks are obviously much deeper and shadow detail is far superior to that which was achieved on the earlier model.

Lumen Output. Not only is contrast outstanding, but the AE3000 has an excellent range of lumen output. Dynamic mode is the brightest, and measured 1273 lumens on our test unit. With factory defaults, the picture in Dynamic mode has a greenish cast to it. But if you bump red up about five notches and green down a couple, you end up with a very bright picture that is also quite pleasant to watch. It isn't perfectly color calibrated, but the evident greenish cast is substantially diminished, and most casual viewers will find the picture to be quite satisfying. It is a great operating mode for Super Bowl parties or other events where you need the extra brightness to combat ambient light. It is also an ideal operating mode for video gaming with room lights on.

Most videophiles will opt for the more ideally color balanced operating modes. In this regard, the AE3000 shows more improvement in lumen output over the AE2000 than the slight change in maximum lumen specs would imply (1600 vs. 1500 respectively). Both models have three distinct Cinema calibration modes, labeled 1, 2, and 3. Last year we measured the AE2000's lumen output in these modes at 345, 390, and 370. But on the AE3000, we measured these same modes at 385, 470, and 566. In addition, Normal mode is an excellent trade-off calibration between the Cinema modes and Dynamic; it was putting out 792 lumens, with not much degradation of color to be too concerned about. I had a large party at my home this past weekend, and I used the AE3000 in Normal mode to display live concert Blu-ray discs. My guests were mesmerized by the brilliant, realistic three-dimensionality of the image. The most frequent comment I heard --- "Why would you ever go to a concert when you can have this instead?"

As a final note, the position of the zoom lens and setting the lamp to eco-mode will both diminish lumen output in all operating modes. Eco-mode will cut lumens by 18%, and the zoom lens at maximum telephoto cuts lumens by up to 41%. So if you need to maximize lumen output, use the wider angle end of the zoom lens if possible.

Frame Creation. The AE3000 has a new feature which Panasonic calls Frame Creation. When activated, it allows the projector to evaluate movement between previous frames, generate an interpolated frame as a half-step, and insert it into the frame sequence. This is then played back at either 120 Hz or 96 Hz depending on if the source is 30, 60, or 24 fps. You have three choices- Off, Mode 1, or Mode 2. You can select "Off" if you want to disable the feature altogether. Mode 1 will use the prior two frames to do the interpolation, and Mode 2 will use the prior three frames.

The benefit of Frame Creation is that it renders a smoother, sharper image when the camera is panning, or when detailed subject matter is moving across the screen. The sharpening effect is more pronounced in Mode 2 than it is in Mode 1. Why did Panasonic give you the option to turn it on or off, you may wonder? The reason is that, though Frame Creation sharpens the image, it can make the image look to some viewers a bit less like natural film. Thus it can create an effect that some find objectionable. Therefore, you can experiment with it, and decide for yourself whether you want it off, or in Mode 1 or Mode 2.

When you have Frame Creation active it increases video processing time and thus delays delivery of the image to the screen. Even with Frame Creation off, you will typically see a slight video delay (most obvious in lip-synch). That delay becomes more noticeable in Mode 1, and more noticeable yet in Mode 2. If you are just getting started in home theater, keep in mind that all video display systems tend to manifest a bit of video delay that can produce lip-synch issues. That's because it takes more time to buffer and process a video stream than it does to get an audio signal to the speakers. The way you fix this is to use a corresponding audio delay feature that is built into most A/V receivers and external video processors. Or you can use something like the comprehensive but inexpensive Felston Audio Delay, which is what we use in our lab (see review). Audio delays will enable you to bring the sound and picture back into perfect synch, and they are an important part of your home theater set up.

Gaming Mode. As far as gaming is concerned, video delay is not a good thing, and audio delay does not fix the problem. So the AE3000 has a feature which is not called Gaming Mode, but should be. It is called Frame Response, and it lets you adjust the speed of frame delivery from the buffer. Your options are "Normal" and "Fast." "Normal" will provide normal video processing and results in a frame delay of about 3 frames (assuming Frame Creation is off). "Fast" will eliminate some of the standard video processing overhead and cuts frame delay to about 1.5 frames. You can see the effect on lip synch when switching between Normal and Fast, as lip synch problems pretty much disappear in Fast mode. There is no way for a video picture to appear instantaneously with zero delay on any digital video display, so the Fast frame delivery feature on the AE3000 is about as good as it gets. Put the AE3000 into Fast frame response mode, select Dynamic calibration with a few color tweaks, and you end up with a magnificent high resolution gaming system.

(By the way, we tried to activate Frame Creation while setting Frame Response to "fast" to see if the projector would explode. Apparently, the engineers anticipated this. The AE3000 simply defaults to Frame Creation and ignores the fast Frame Response command. The AE3000 knows when it is in the hands of a stupid user.)

Lens Memory. Are you interested in Cinemascope 2.35 widescreen format? A lot of home theater enthusiasts who are mostly interested in widescreen movie viewing (as opposed to HDTV sports and 16:9 HD broadcast programming), are considering the wider format 2.35 screens these days since most movies being made are in this format. The problem has always been how to get the picture from a native 16:9 format projector to fill a 2.35:1 widescreen. The traditional method is to use an external anamorphic lens which can optically distort the image from a 16:9 aspect ratio into the wider 2.35 format. This certainly is one option. Unfortunately, anamorphic lenses cost a lot of money. Typically they are more expensive than the AE3000. So they add a huge expense that most people thinking about buying the AE3000 wouldn't want to pay.

The "poor man's" way to solve the problem has been to use a projector with a long enough zoom lens to move the image size back and forth-zooming to wide angle to fill a 2.35 screen, then zooming forward to fill the vertical height of the screen when a 16:9 or 4:3 image is being viewed. This eliminates the need to buy an anamorphic lens, but it introduces the nuisance factor of having to manually adjust the zoom lens and (often) vertical picture height as well every time you change the format of the viewing material. This can get annoying in a hurry.

Panasonic's "Lens Memory" system is a clever and exciting solution to this problem. If you have a 2.35 (or 2.4) screen, you can set up the projector with the lens toward the wide angle end, and fill the screen exactly to the format of a 2.35 (or 2.4) movie. Activate the Lens Memory feature, and it will go through a routine to memorize the exact position you have selected for the lens. Then zoom the lens forward so that a 16:9 picture fits perfectly into the height of your 2.35 screen. Now activate the Lens Memory feature again, and it will memorize this setting as well. Once you have done this, the AE3000 will automatically reset the lens either to 2.35 or 16:9 at the touch of a button. Presto! You've got an easy-to-use solution for 2.35 Cinemascope movies without the burdensome expense of the anamorphic lens.

We examined this feature closely to ensure that the zooming adjustments were precise and that focus was maintained after each re-adjustment. On our test sample, it passed with flying colors. In addition, keep in mind one thing: If your projector is mounted above the centerpoint of the screen so that it is projecting at a downward angle, the center of the projected image will shift vertically when moving from 2.35 to 16:9. The good news is that the AE3000 has the ability to reposition the 2.35 image up or down within the 16:9 native frame, and this capability has been integrated into the Lens Memory feature. So if your projector is mounted above the center of the screen, you can set both the lens position and the position of the image in the frame, and they will both adjust with a single touch of the button.

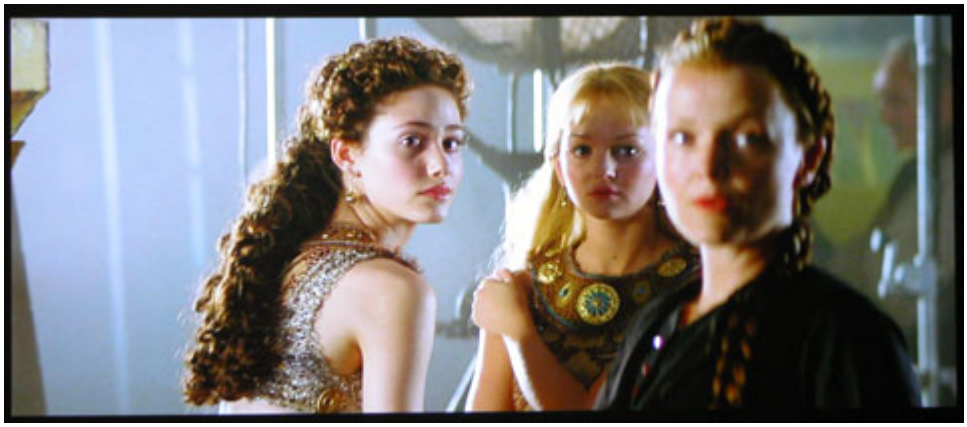
Smooth-screen filter. Panasonic home theater projectors are famous for their Smooth Screen technology-essentially a filter that removes visible pixelation. The AE3000 has this same feature. However, it appears to have been adjusted slightly. The AE2000 and its predecessor the AE1000 are the only 1080p projectors we've seen to have absolutely no pixelation at all. On the AE3000, there is a more distinct pixel structure when viewed up close. It is still subtle and completely invisible at normal viewing distances. But it looks like the filter has been tweaked slightly to avoid erasing all hint of pixel structure. As far as we're concerned, this is handy in that it helps for fine-focusing. In theory the presence of a little bit of pixel structure should also contribute to a slightly sharper picture. The AE3000 does indeed appear sharper than the AE2000, but it is difficult to separate the effects of the increases in contrast from any effect of the filter. Higher contrast images always look sharper when the image is equal in all other ways, and we would never have called the AE2000's image soft by any means.

New Remote Control. The AE2000 had a large, complicated learning remote that could control several devices in the theater. This has been abandoned and replaced with a smaller, more ergonomically friendly remote with large, easy to access buttons and great backlighting. Overall, we like this new one a lot better.

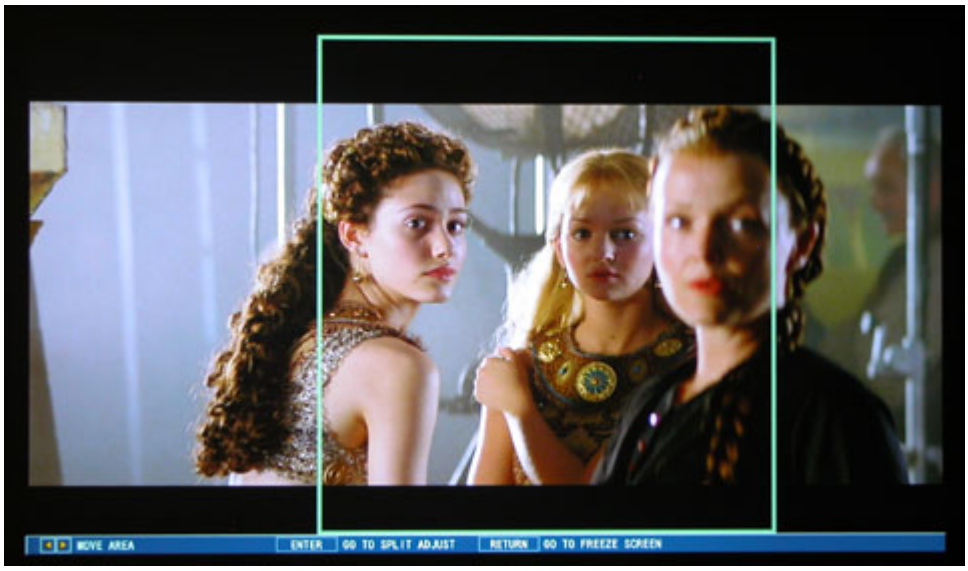
Other features. Many of the features that made the AE2000 so popular have been carried forward into the AE3000. Fan noise is still very low--just a whisper in full power mode. Even in high altitude mode, when the fan is moving extra volumes of air to compensation for thin atmosphere, the unit is remarkably quiet. And in eco-mode, the fan is for all practical purposes silent-you cannot tell it is on unless you put your ear close to it.

The on-board wave form monitor that appeared on the AE2000 has been a hit with users, and the AE3000 has it as well. The system assists in the calibration of the projector, and for those into tweaking it is a great tool to have available.

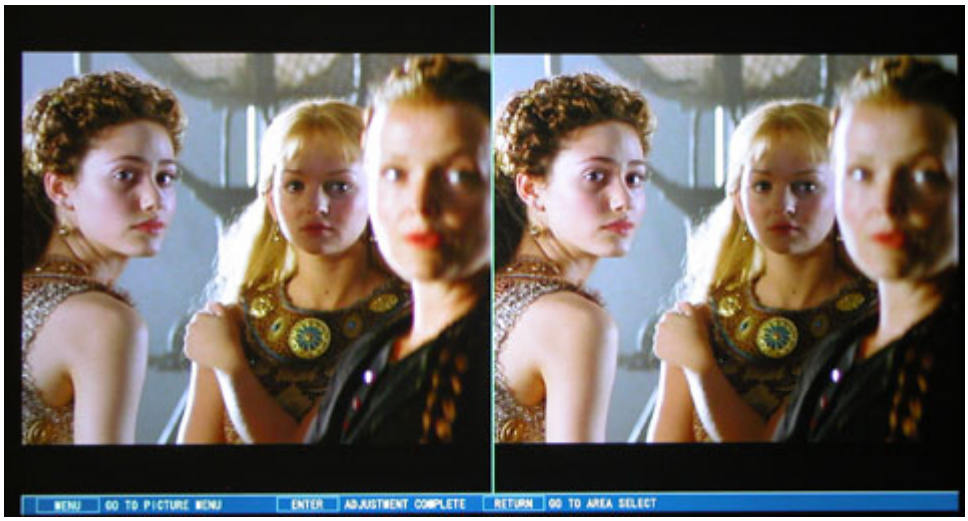
Similarly, split screen calibration is another popular feature introduced last year. a feature that you don't find on many home theater projectors. Here is how it works. Start with a screen image that you want to use as a template for making your adjustments, as follows ...



After you freeze the frame you want, you simply activate the split screen option, and a rectangular selection window pops up. You can move it back and forth to define which section of the image you want to work with



Once you have selected the desired section, the projector will replicate it such that you have two identical copies side by side .....



Now you can make any adjustments you want to color temperature, color saturation, brightness, contrast, or gamma. The projector will apply the adjustments you make to the image on the right side of the screen, and hold the image on the left side constant. In this manner you can see precisely the effects of the changes you are making. You can finish by either saving or discarding the changes you've been experimenting with. For many users, this is a great educational tool that helps you understand the nature and range of the various adjustment controls available to you.

Limitations

Last year we had a hard time finding much to complain about on the AE2000, and the task is doubly hard with the AE3000. Certainly, for those who want to ceiling mount their projector, it would be nice to have an option to get it in a white case. As it is, the dark gray casework may not be aesthetically pleasing when mounted against a white ceiling in a living room or some other multi-purpose room. However, in a dedicated theater room it won't make any difference.

Last year we mentioned the lower lumen output in Cinema modes as being somewhat of a limitation, but that has been fixed in the AE3000.

The warranty is one year, which is the minimum acceptable warranty period for the industry. Many home theater projectors come with two year, and in some cases three year warranties. On the other hand, you can buy an additional year or two of warranty, and still end up with a projector that is a phenomenal value for the money paid.

Conclusion

The Panasonic AE3000 will be one of the year's hottest selling projectors. With stunning, natural high-contrast image quality and an impressive array of unique features that don't exist on competing models, Panasonic has established a formidable price/performance proposition that will be hard for others to match.

We have awarded the AE3000 five stars for performance based on excellent contrast, outstanding black level, outstanding image stability with frame interpolation, and a first-rate high brightness mode. It isn't quite as sharp as the Mitsubishi HC6500 or HC7000, but it is comparable to most of the other 1080p models it competes with. As far as features are concerned, the AE3000 has lens memory, split-screen calibration, an onboard waveform monitor, and the frame interpolation system that, collectively, make this projector the most feature-laden 1080p projector on the market. On top of all that, it is selling for very aggressive street prices. It is not possible to give this model anything other than a full five stars across the board.