

LCD Takes on CRT

Here's the skinny on the benefits of liquid crystal displays

It's a familiar, ageless cycle: New technology hits a magic price-point and poof! Products built on time-tested older technology get eased aside. As with vinyl record albums and CDs, the same can now be said for cathode ray tubes (CRTs) and liquid crystal displays (LCDs).

In 2005, space-saving LCDs are expected to account for \$10.3 billion in U.S. revenue according to Framingham, Mass.-based industry researcher IDC. And that's just the beginning; IDC says in 2006, worldwide LCD sales will hit 45 million units. Sales to developing nations are expected to make up the bulk of CRT sales.

However, CRT technology won't vanish overnight. Leading vendors, including HP, IBM, NEC-Mitsubishi, Samsung, ViewSonic and others still offer an impressive stable of conventional and flat-panel CRT-based monitors.

But even loyal CRT users must concede that the latest generation of LCD technology is so visually stunning and attractively priced that it demands serious consideration. A closer look at the return on investment (ROI) of CRT displays versus LCDs shows that the latter are no longer just attractive "extravagances."

Purchase Price

Prices for LCD technology have been falling 30 to 50 percent over the last few years. Now, the best selling 19-inch LCDs sell for less than \$299 and as low as \$259. Solid 17-inch LCDs can be had for as little as \$249. While CRTs remain inexpensive, the price gap between the two technologies is closing rapidly.

Even now, LCDs' higher initial price tag can quickly get offset by various direct and indirect savings. One place you'll definitely notice ►

big savings is in shipping costs. Lighter and smaller LCD technology (as light as eight to 10 pounds versus 40 to 50 pounds for CRTs) can reduce shipping costs by up to 40 percent, according to a recent study by ViewSonic. Those savings add up quickly when you're talking about dozens or hundreds of monitors.

All this is not to suggest that today's LCD monitors are plug, play and forget. After two to four years, you'll probably need to replace the cold-cathode fluorescent backlights that illuminate LCD monitor screens; luckily, most vendors offer extended warranties covering the parts. Take some comfort knowing that today's LCDs can last ten years — roughly double the life span of a CRT. For many, that translates directly into lower replacement costs.

And with fuel costs rising, here's where LCDs really shine. Most new LCDs are ENERGY STAR compliant and draw 40 to 45 Watts — less energy than a reading lamp. That represents a whopping two-thirds reduction in power usage over an equivalent sized CRT. Thus, the average user can expect energy savings of around \$34 per year (\$170 over the monitor's lifetime). It's easy to see how quickly savings pile up with large purchases. And because LCD monitors generate less heat than CRTs, organizations can expect to reduce associated air-conditioning and cooling costs.


Ergonomics

It is true that users like the look of LCDs. But this beauty is more than skin deep: The ergonomics of LCDs also favorably impact several direct and indirect costs of ownership.

One of the most obvious benefits of an LCD is its size. LCD technology delivers more usable space in a smaller package, roughly one-third the footprint of an equivalent CRT. (A 15-inch LCD effectively equals a 17-inch CRT, 17-inch LCD equals a 19-inch CRT). This more efficient use of desktop space can make a big difference, especially in small, cramped spaces like call centers and computer rooms. Larger organizations, especially those located in high-priced real estate, will also see clear advantage: more users in less space. Finally, a more manageable form factor allows IT and others to easily move LCDs, whether across the hall or the state.

LCD technology is also safer. Unlike CRTs, LCDs don't use electron guns to create images. As a result, concerns about radiation emissions or EMI (electro mechanical interference) are virtually nonexistent. This also makes LCDs ideal for sensitive medical and electronic testing environments.

Then there are the little benefits. Some monitors, like the PE1700 from Planar, feature a built-in power supply, enabling easy wall-mounting with few cables. Most units now include integrated USB connections along with plug-and-play replacement. And even if a user's current PC lacks a digital interface port, LCDs will be ready to accept digital input when their next system arrives. Twist, swivel, pivot controls and adjustable portrait/landscape screens make LCDs more comfortable to use, which also effects productivity.

The new wave of affordable, high-performing LCD products has ushered in a new era of computer displays. CRTs will continue to sell. But when it comes to purchasing multiple monitors, it's clear: LCDs are taking over. 

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Compare and Contrast

One of the big promises of LCD technology is improved user productivity. How? Numerous studies suggest users can comfortably spend more hours working at an LCD than a CRT — better image quality reduces eyestrain. A look at the key elements of viewability will show why LCD technology can boost the organizational return on monitor investments.

Brightness and contrast. Monitor brightness is measured in nits (shorthand for candelas per square meter). At 200 nits, LCDs outshine CRTs, though brightness can degrade as much as 25 percent from center of the screen to the edge. Some new models let you brighten just a portion of the screen. This can be handy when viewing video or pictures. LCDs also need a corresponding high contrast ratio. This is essential for good color reproduction and accurate gray scaling. Again, the new LCDs — boasting ratios as high as 1,000:1 — meet or beat CRTs.

Color. Older LCDs were criticized for their limited ability to display subtle color tones. To get around the problem, leading manufacturers began putting three thin-film transistors in each pixel of active matrix LCDs. Now many new LCDs can display up to 16.7 million 24- or 32-bit colors at various

"temperatures," rivaling CRTs. Though some users may still prefer CRTs for preprint work and video mastering, LCD has become an attractive alternative for most organizational users.

Sharpness. Here's where underlying technology makes all the difference. CRTs form individual pixels by displaying multiple dots or stripes. The distance between individual dots or stripes — known as dot pitch — determines how sharp characters look on screen.

In LCDs, each pixel consists of one or more transistors. These produce images that are exactly the size of one pixel. For example, when Samsung's SyncMaster 913V advertises a 0.29 mm pixel, it's all pixel. No spaces. The resulting sharpness makes LCDs a preferred tool of engineers and CAD users. However, some users may find LCD image too sharp. In these cases adjusting sub pixel rendering controls can eliminate "jaggies" on single letters.

The bottom line is that despite excellent color and higher top resolutions, CRTs make it harder for most users to focus, which can cause eyestrain. Today's LCDs promise more comfortable viewing for more productivity.



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