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Thin, flexible computer screens have military, civilian potential

Silicon Valley / San Jose Business Journal - by [Andrew F. Hamm](#)

Imagine you are commuting to work reading this newspaper on an electronic screen as thin as a thick piece of paper and as flexible. Updates on stories are sent electronically as they happen.

Now imagine you are an infantry soldier in a muddy ditch late at night with shells bursting around you. You look to your wrist computer to get your bearings, known positions of friend and foe and even a weather report.

San Jose-based United States Display Consortium conceived of the latter technology while working with the U.S. Army to develop a better way to get information to its ground troops. However, the former scenario could be one of several civilian offshoots of the military technology and could arrive as soon as early next decade, says Mike Ciesinski, president and CEO of USDC, a public-private partnership formed to develop rugged, lightweight flexible display screens.

Using USDC's idea, the Army on Feb. 10 signed a \$43.7 million, five-year contract to develop a flexible computer system display center at Arizona State University. The contract includes a five-year, \$50 million extension provided certain advances are made by 2009.

"Nothing like this really exists," says Mike Ciesinski, president and CEO of USDC. "We're really just starting to scratch the surface."

The Army isn't even really sure exactly what it wants. It could be a flexible screen that can be rolled up and put in a pocket or attached to a wrist. It would obviously have to be strong enough to take a constant pounding, but also resist water damage and repeated bending, and be light enough to not impede a soldier on a battlefield. The goal is to make troops faster by providing information more quickly and lightening their load. Today's soldier carries approximately 100 pounds of equipment in battle, including 40 pounds of batteries, Mr. Ciesinski says.

"Flexible display technology has the potential to be implemented in a wide variety of applications from command centers, to vehicle platforms to individual soldiers," says John Miller, acting director of U.S. Army Research Laboratory. "It will revolutionize the way in which information is disseminated on the battlefield, increasing both the lethality and survivability."

Emerging technology includes a form of electronic ink that can be laminated onto a thin circuit board and manipulated with a light source; Kodak is developing a film-like substance where images can be transmitted from a central command. While the first models will concentrate on one-way communications, there is no reason that a wireless keyboard small enough to fit into a pocket or backpack couldn't be included, Mr. Ciesinski says.

On the civilian side, the technology could revolutionize ebook technology, turning heavy books children carry to school each day into a thin sheet.

Newspapers and magazines could be replaced by thin screens that could be carried in briefcases or even rolled up and put into a shirt pocket.

Conventional computer screens and personal digital assistants would be thinner and lighter as well.

"Thin, lightweight, flexible screens -- it is very well understood in Silicon Valley as the next big thing," Mr. Ciesinski says. The screen could be metal, plastic or even some form of glass.

Besides USDC, Gyricon LLC of Palo Alto, FlexIC Inc. of Milpitas and Vitex Computer Systems of San Jose are part of a technology development group that could eventually include such Silicon Valley

stalwarts as Intel Corp. and Applied Materials subsidiary AKT Inc., says Greg Raupp, director of the Flexible Display Center at Arizona State University.

"We are talking to a host of Silicon Valley companies interested in working with us on this concept," Mr. Raupp says. "We expect many more to be involved before this is done."

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