

Phoenix Business Journal - February 7, 2005

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PHOENIX Business Journal

Friday, February 4, 2005

ASU-Army center developing new technologies

Phoenix Business Journal - by [Adam Kress](#) The Business Journal

One of Arizona State University's highest-profile partnerships begins in earnest Feb. 4 as the ASU/U.S. **Army Flexible Display Center** is dedicated at the school's Research Park in Tempe.

The center was created to develop small, flexible and wireless electronic information displays that are lighter and more efficient than existing glass-based displays. They will be used by the U.S. Army and later by consumers in a variety of products.

The **U.S. Army Research Laboratory** chose ASU a year ago as its primary partner on this \$43.7 million, five-year cooperative. Over the past year, ASU acquired and brought up to date a 250,000-square-foot building formerly used by **Motorola Inc.** that includes more than 43,000 square feet of clean-room space.

Now the cooperative is set to begin research in a fascinating new area of technology that could profoundly change how military battles are waged, not to mention how computer monitors, cell phones and other everyday displays operate.

The Army provided most of the funding for the center, but the FDC will focus primarily on commercial applications -- where the vast majority of the flexible display market lies. Smaller displays could go in cell phones and health monitors, slightly larger displays in cars and even larger displays in advertising and conferencing applications.

Greg Raupp, director of the Flexible Display Center and a 20-year ASU faculty member, said about 12 to 15 projects are starting up at the center, all aimed at creating the first generation of flexible display technology. The first displays likely will be suitable for cell phones and PDAs.

"I'm only guessing, but the simplest displays should be out there in about three years," Raupp said. "They will be small and not too flexible, but they will only get more advanced with time."

Two industry partners that already have set up shop in the center will be a big part of the early work there.

The EV Group, an Austrian firm that specializes in wafer-processing equipment, created its U.S. headquarters at the center and soon will have about 25 people there. Raupp said the EV Group will help the center with bonding and debonding technology.

"We're going to work with the same substrates (glass-based displays) that work with existing testing equipment, but load thin sheets of our displays over glass," Raupp said. "Once it's tested, we'll debond it. We want to make sure the displays withstand all our testing."

Ito America, with offices in Scottsdale and Boca Raton, Fla., also will have four or five people at the center. That company will focus on integrating the displays with electronics and other components.

A bevy of other academic and industry partners will work with the center. They include Cornell University, University of Texas, Honeywell International, **General Dynamics** and the U.S. Display Consortium, among others.

"You can do a heck of a lot more when these different groups are working side by side," Raupp said.

Over the past year, ASU has brought in about 20 engineers and researchers who will work full-time at the FDC. Over time, 30 to 50 graduate and doctoral students also will conduct research at the center. A year from now, Raupp said, ASU likely will hire another 10 to 12 people when a second process line is added.

David Morton, display technology manager for the U.S. Army Research Lab, said flexible display technology is going to become increasingly important in the military.

"We think flexible displays will not only replace what we are doing now, but create new ways to do things," he said. "By putting these displays on radios and maps, we can greatly reduce the weight soldiers have to carry."

A primary key to this new technology is reducing battery power, and therefore weight.

"The efficiency of the display helps with using less battery power," Morton said. "It acts like a piece of paper and works on the ambient light around you. So the image will stay readable for a long time without using much power."

The first displays -- of which there could be prototypes by midyear -- will be monochrome, but later developed in color. Flexibility-wise, the displays eventually will evolve into rollable and then foldable devices. Imagine a soldier folding up a wirelessly updatable digital map and simply putting it in his pocket, opposed to lugging around a heavier device such as a tablet PC.

But those technologies are down the line.

"I would compare the texture of first displays to a thin cardboard," Morton said.

Since ASU was awarded the center, it has continued to garner more and more attention, Raupp said.

"People from all over the country, and even other countries, call me and want to come see what we are doing," he said.

Joe Yuhas, deputy director of the **Arizona Department of Commerce**, said the commercial applications developed at the center and the partnerships formed within it could lead to new companies sprouting up around the FDC.

"When new technology is developed, it potentially leads to related industries clustering around it," Yuhas said. "It draws similar companies and competitors."

Yuhas said he will more aggressively tout the Flexible Display Center when luring firms to the state.

"It's one more big example of our growing high-tech presence," he said.

Get connected

Flexible Display Center: flexdisplay.asu.edu.

U.S. Army Research Laboratory: www.arl.army.mil.

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