

Document Imaging Report

Business Trends on Converting Paper Processes to Electronic Format

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A Terabyte On A 5.25-Inch Disk?

Making things even more interesting for Plasmon is the emergence of another high-density disk format that could potentially challenge UDO. That is holographic storage. Holographic storage is not really new. It's been around since the 1960s and, like high density optical, has left a trail of failed companies in its wake. However, two spin-offs of well-known technology stalwarts have recently announced they are shipping holographic media. When created in the 5.25-inch form factor so popular for optical storage, one piece of holographic media can purportedly store between 60 GB and 200 GB of WORM data.

"The amount of data that can fit on a piece of holographic media is determined by the complexity of the drive," explained John Berg, president and CEO of Polaroid spin-off Aprilis. "In future generations, we think we can increase the capacity of the media to a terabyte."

As its name indicates, holographic storage involves the storage of data in a 3-D configuration. In addition to creating more capacity, this configuration also greatly increases the speed of retrieving files. "We can search and retrieve files a million times faster than with conventional methods," said Berg. "In document management applications, this would enable users to eliminate indexing. They could just run a search and quickly scan the full-text of every document on a piece of media."

According to Nelson Diaz, president and CEO of Aprilis competitor and Bell Labs spin-off InPhase, once a file is found, its transfer rate from holographic storage is another differentiating factor. "Our technology can transfer files at 20 megabytes per second if the user has enough bandwidth," he told DIR.

Diaz added that currently InPhase is taking a hard look at the document archiving market. "Document archiving is an established space, and to break into an established space, you need to have a head-turning value proposition," Diaz told DIR. "We think by offering storage that is at least 80 times less expensive than the most cost-effective optical solution and more than 10 times less expensive than tape, we will provide that. Also, we are offering all the stability that makes optical a more reliable long-term storage solution than tape."

Holographic naysayers call the technology an academic exercise that will never reach the true production stage. "An inexpensive reliable media has been the main obstacle to holographic storage reaching the commercial market," Diaz told DIR. "While other industries have advanced other components, like the lasers and cameras, needed to make holographic storage commercially viable, until now the media could only be made with expensive materials. This made it impractical to take to market. Now we are shipping commercially viable media made with inexpensive polymers."

Berg concurred with Diaz and said that eliminating shrinkage when exposing polymers to the intense heat needed for holography has been the main challenge for media manufacturers. "In November 2000, our holographic technology was chosen out of 57 candidates by the U.S. Department of Defense in a research project done at Stanford University. Since then we have been working to make it commercially available."

Both Aprilis and InPhase are shipping media to several partners around the world who are evaluating it and working with it. Sony acknowledged it is "now researching and developing a holographic ROM system for high-speed replication." "This research is still at an early stage of exploring the fundamental technologies," a Sony spokesperson told DIR.

In the mean time, Aprilis and InPhase are also developing their own drives. "We are working on drives targeting some very specific applications," Berg told DIR. "We are focusing on providing the killer app by leveraging our differentiating attributes, like our search capabilities. We do not want to go head-to-head with magnetic storage. We also are seeding the mass market."

Added Diaz, "Because it is the path of least resistance, we initially are focused on developing drives that fit the popular 5.25-inch form factor. We want our drives to fit into existing robotics. However, because of the way holography works, we also can create very small, high-density drives and media that have no moving parts. We expect to begin shipping drives in 2004."

Diaz concluded by saying that InPhase is looking for partners to license its technology. "This is a new technology, and we are really trying to gain market acceptance," he said. "I'm open to considering any types of partnerships, even those with competitors."