

SPECIAL ADVERTISING SECTION

Optical Storage Technology

Gains More Momentum

OSTA.org
Optical Storage
Technology Association

WHY BUY OPTICAL?



Because of its inherent flexibility and affordability, optical storage technology continues to grow at a rapid pace.

This evolving technology owes much of its success to the standardization of the Compact Disc (CD) in the 1980s by Philips and Sony. Because this standard has been universally accepted, the CD market has been on a steady growth path over the past two decades. Along the way, the technology has evolved from CD read-only capabilities (CD-ROM), to CD-Recordable (CD-R) and, most recently, the CD-ReWritable (CD-RW) format. CD-R permits permanent recording, while CD-RW discs can be recorded multiple times and content can be edited or deleted.

Even as DVD technology attracts considerable attention, venerable CD technology is not only holding its own, but recordable versions are making substantial gains. In particular, CD-R and CD-RW media will continue to be leading data storage solutions for the next five to 10 years, according to Raymond C. Freeman, Jr., facilitator for the Optical Storage Technology Association (OSTA), an international trade association created to promote the use and proliferation of optical recording technologies and products.

"In spite of the promise of DVD and other emerging optical technologies, recordable CD stands out as an ideal solution to meet industry needs for next-generation, cost-effective storage capabilities," notes Freeman.

Indeed, the market for recordable CD technologies is soaring, as indicated by media sales. Freeman says that the 1.4 billion CD-R discs sold worldwide in 1999 is just a beginning, predicting that 3.3 billion units will be sold in 2001. In addition, demand for CD-RW drives is growing sharply according to Mary Craig, principal analyst at the Gartner Group/Dataquest, research firm located in San Jose, Calif., who predicts sales of 50 million units in 2002; a major jump from the 14 million units shipped in 1999.

Among the factors driving this growth are the emergence of a variety of business and consumer applications that

require flexible, cost-effective storage capabilities. CD-R, with its advantages in media compatibility, longevity, and portability, meets these needs.

Recordable CDs are now being used to receive, store, and disseminate large quantities of digital, analog, audio, video, and graphic data. The rapid growth of the Internet, with its wealth of easily accessible multimedia data, coupled with the inclusion of a CD-ROM drive in virtually every home and business computer, is also driving the need for the kind of storage capabilities recordable CD technology provides. And even though the Y2K bug failed to bite due to the efforts of IT organizations around the world, preparations for the millennial non-event highlighted the effectiveness of recordable CD technology for backing up valuable files, records, and system software.

A steady drop in price is also fueling continued growth in the recordable CD marketplace. CD-R discs cost as little as \$1 each — that's fifteen-hundredths of a cent per megabyte, far less than other high capacity storage options, including Zip disks. CD-RW disc prices are falling as low as \$2 each. Prices for the CD-RW drives that record both types of discs are also dropping, with low-end units starting below \$100. Freeman estimates that the adoption rate of CD-RW drives will grow briskly, eventually topping 20 million units a year.



The Advantages of Being Optical

When compared with other random access removable storage solutions, the continued and growing popularity of writable and rewritable optical storage technology is hardly surprising, particularly the CD and DVD varieties. Among its benefits are:

- **Compatibility** — Due to OSTA's MultiRead specification and broad support by operating systems, all varieties of CD discs are easily readable on an ever-expanding universe of drives. OSTA is working to bring about the same level of read compatibility for DVD discs as well.
- **Durability** — Because a laser is used to store and retrieve data on optical discs, nothing touches the recording layer but a beam of coherent light. Optical discs last decades longer than traditional storage options.
- **Scalability** — Optical technology provides a variety of storage capacities with room to grow from megabytes to terabytes. For example, single-disc capacities range from 700 MB to 17 GB, with jukeboxes running up into the terabyte range for data warehousing and other mass-storage applications. This is the only technology of its type that can scale from laptop to enterprise solutions.
- **Accessibility** — Migration software has been developed that allows unused data to be moved from its primary location to an easily accessible optical library. Data can be saved more conveniently for faster access and response times. Optical drive access to data rates — using random access technology — are typically 100 times faster than tape.
- **Capacity** — A single 4.7-inch CD holds 700 MB of data, the equivalent of approximately 20 four-drawer file cabinets.
- **Portability** — Tough, portable, and secure, optical discs can even be transferred by mail.
- **Affordability** — Recordable optical storage technologies have the lowest cost per megabyte of any removable random access media device. And CD-RW technology allows the re-use of the media thousands of times, optimizing its price/performance characteristics.

Navigating the Speed Bumps

The next evolutionary step in the development of optical storage technologies is recordable DVD. However, DVD is not yet enjoying the smooth ride that recordable CD technology is experiencing.

Instead, during the 1990s, issues around royalties and technology ownership had a major impact on the definition of DVD technology, thereby impacting the market's growth. The result is the development of two competing formats: the DVD-RAM format from Hitachi, Matsushita Electric, and Toshiba versus DVD+RW championed by Hewlett-Packard, Philips and Sony. In the opening skirmishes, the DVD+RW camp claimed higher capacity with its expected 3 GB capacity versus the DVD-RAM 2.6 GB specification. The DVD+RW camp also contended that its specification was more backward compatible with earlier CD and DVD formats. The DVD-RAM group counters with a claim of better defect management and a format that is more scalable to next generation higher capacity drives. While both formats offer viable solutions; the disagreement between the two camps — plus the fact that the installed base of DVD-ROM and DVD-video players to read the recordable discs is still relatively small — has resulted in slower than expected overall market growth.

Reporting on the DVD standards issue, Freeman says that, "2.6 GB DVD-RAM drives are currently available in the market and the 3 GB DVD+RW drives have not been introduced. DVD-RAM and DVD+RW drives capable of storing up to 4.7 GB on each side of the disc are expected to ship later this year. However, the lack of a single recordable DVD standard causes users to be understandably wary about which standard will ultimately prevail."

Despite this, Freeman expects DVD to eventually replace CD technology for low-cost, high-capacity storage of data and multimedia content



Enter OSTA

Fortunately, OSTA has been operating behind the scenes with the consumer's best interests in mind since 1992. Because OSTA is an association, not a standards body, it works to achieve a true consensus among all interested parties — a time consuming but often rewarding process. Its goal is to promote the use and proliferation of optical recording technologies and, because its member companies account for 85 percent of worldwide writable optical product shipments, it has had some notable successes. Most pertinent to the potential resolution of the writable DVD situation is OSTA's MultiRead specification.

MultiRead grew out of problems associated with reading CD-RW discs with drives designed to only read CD-ROM and CD-R discs. Because the reflectivity of the CD-ROM and CD-R discs is similar, there were no significant incompatibility issues until CD-RW, with its considerably lower disc reflectivity, appeared on the scene. OSTA's voluntary MultiRead specification defines the requirements that drives must meet in order to read all four principal types of CD discs — CD Audio, CD-ROM, CD-R, and CD-RW. The MultiRead specification is now integral to more than 95 percent of the CD drives being shipped, and plays a major role in sustaining the industry's accelerating growth. Vendors whose drives qualify for

the MultiRead specification and licensing program may display the MultiRead logo on their devices and in their marketing materials.

In support of the industry's growing migration to DVD technologies, OSTA is extending the capabilities of its MultiRead specification with its release of "MultiRead 2." Developed to address the burgeoning needs of DVD technology, MultiRead 2 will enable manufacturers of DVD drives to ensure read compatibility with the industry's first rewritable DVD format — 2.6 GB DVD-RAM — in addition to allowing these drives to read all classes of CD media, an important marketplace consideration given the immense number of CD discs in use. MultiRead 2, which incorporates all elements of OSTA's original MultiRead specification, is designed to protect users' investments in CD media and its content as they upgrade to DVD drives.

Says Freeman, "As the popularity of optical storage continues to grow, users must feel comfortable about moving to more powerful storage solutions without worrying about losing access to content already recorded. That's why OSTA will continue with its work of building consensus for compatibility in the optical storage industry."

OSTA — Building Consensus to Promote Optical Storage Technology

Established in 1992, the mission of the Optical Storage Technology Association (OSTA) has been to promote the use of optical recording technologies and products. OSTA's members and affiliates include optical product manufacturers and resellers from three continents representing more than 85 percent of worldwide writable optical product shipments.

OSTA committees and subcommittees work to shape the future of the industry through regular meetings and the development of optical technology specifications, including MultiRead and UDF. MultiRead, as well as the recently announced MultiRead 2, are specifications designed to enable read compatibility among all types of CD and DVD drives. The Universal Disk Format (UDF) specification ensures that computer data written to all types of optical disks will be logically consistent. Both specifications work to protect users' investments in CD media and its content as they upgrade to newer CD and DVD drives.

OSTA, through its specifications and push for industry consensus, has provided an impetus towards compatibility among product classes. It will continue to work side-by-side with manufacturers and distributors to resolve compatibility issues and to promote the use and proliferation of writable optical technologies.

Interested companies can learn more about OSTA, join the organization, and participate in its programs by contacting Ray Freeman at 805-963-3853 or by checking out the Web site at www.osta.org.



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