

Technology Today

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Alan Pierce

SuperDisk™ Technology

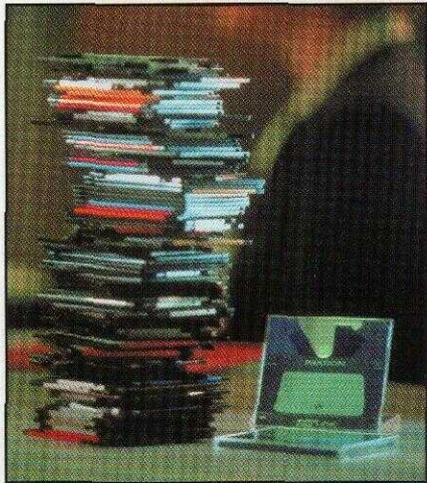


Photo 1—The LS120 disk stores enough data to fill S3 standard high-density disks.

Photo courtesy Imation Corp.

In January of 1999 I called technical support at the Winbook Computer Corporation to determine if my new Winbook XL2 computer had a mechanical problem in its LS120 drive. I was told that the strange sound emanating from the drive was normal. I have learned that the sound is a distinct characteristic of this dual optical/magnetic drive's architecture. Over time this sound has become music to my ears because of what this optical/magnetic drive can do. How it works as both an optical and magnetic drive was a mystery that I decided to research.

The mystery began unfolding last Janu-

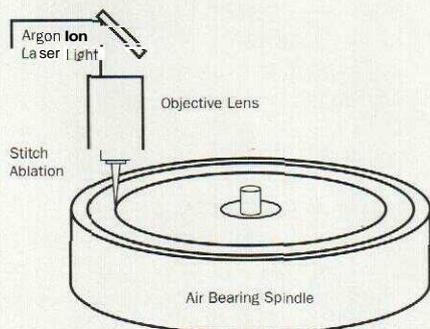


Fig. 1—Laser ablation used to create optical marks on LS120 SuperDisk's surface.

Figure courtesy Imation Corp.

ary when a knowledgeable and friendly technical support associate at Winbook explained that two separate read and write systems built into the same piece of computer hardware generate the sound of the LS120 drive. This dual optical and magnetic technology allows the use of two different types of disks of the same physical size and outward appearance.

The laser inside the drive made many people assume that the optical part of the drive is some sort of CD-RW, a CD that can be written over and over again, and in this case, hiding inside a floppy disk. While trying to determine what SuperDisk technology is, I quickly learned from Imation Technical Support that the SuperDisk isn't a CD-RW. The quest LO find out what the SuperDisk is took several more months of investigation with the aid of Pat Sullivan from Fleishman-Hillard Inc., Imation's public relations firm.

Let's first look at what the drive can do. The drive can read and write to the billions of disks that many of us have been shoving into computers for the last 20 years. This backward compatibility to standard diskettes allows users of computers that have the drive to still use any 3.5" diskette (1.44 MB and 720 KR diskettes) that they may have on hand. Trillions of these disks exist today. Worldwide we are adding over four billion of them each year. The optical part of the Imation SuperDisk Drive allows computer users to store on one LS120 diskette the amount of data that would fill 83 standard high-density disks (Photo 1). This storage capacity is achieved via a laser optical-tracking system that allows Imation to increase the number of magnetic tracks on a diskette from 135 per inch on standard high-density disks to 2,490 per inch on LS120 disks. To allow for the higher density data recording these disks also use an advanced metal paniculate coating.

The SuperDisk drive spins at 2.4 times the speed of a standard drive, and its transfer rate is over 12 times faster than a standard 1.44 MB high-density disk drive. This Imation drive also has a built-in algorithm that detects and corrects errors that the dropout of data during data transfer could cause. Standard 1.44 MB high-density disk drives lack this type of data correction. "Servo stitchmarks" identify the 2,490 magnetic tracks that the drive's Ar-

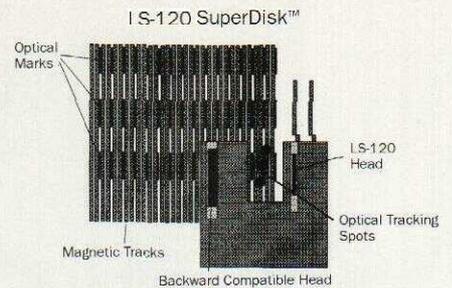


Fig. 2—Optical spots projected through slot in SuperDisk's head.
Figure courtesy Imation Corp.

gon Ion laser optical system reads (Fig. 1). The optical marks read by the laser (Fig. 2) target the magnetic tracks.

The new James Bond movie *The World Is Not Enough* often shows weapons with laser targeting systems. Just as in these new weapon systems, the Imation SuperDisk drive's magnetic read/write system uses its laser targeting system to ensure that its magnetic read/write head stays perfectly aligned with each track. To stay on target, the LS120 SuperDisk drive uses a mirror lens system to constantly follow three optical spots on the disk.

The James Bond comparison comes full circle if you use SuperDisks that contain encryption technology. The disk itself contains the Blowfish encryption algorithm that has never yet been broken. The first time you use an encryption disk, the drive will create a special virtual drive on your computer with its own icon on your desktop. To encrypt files, drag them to this virtual drive, where your individual password automatically protects them. Each encryption disk asks you to provide a password, so you can have one password for many disks or each disk can have its own password. A standard SuperDisk can hold 120 MB, and an encryption SuperDisk can hold 118 MB of data. 

Recalling the Facts:

1. What is the main advantage of the LS120 SuperDisk Drive over a conventional 3.5" disk drive? Over a zip drive?

2. Describe how a laser can increase the storage capacity of SuperDisk Drive.

3. Why would people want to use encryption disks to store data?

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