SuperDisk Technology

• Agenda
  – What is SuperDisk?
  – The Evolution of a New Standard
  – SuperDisk Configurations
  – OEM Supporters
  – Encryption to Protect Your Data
  – Questions & Answers
“Wouldn’t it be nice if once in a while, a new gadget came along that didn’t make the old one obsolete? At last, there is such a gadget.”

—Cincinnati Enquirer
Over 80 Times the Capacity of 1.44 MB Diskettes

120 MB
SuperDisk - What is the product?

• It’s a diskette
  – 120 MB in a familiar format
    • “Something new you don’t have to learn”
  – 5x faster than conventional diskettes
    • 300 to 500 Kbps

• It’s a Drive
  – Read and write 120 MB superdisks
  – Read and write existing 1.44 MB & 720 KB disks
  – IDE internal, external parallel, USB, SCSI, PCMCIA
83 HD Diskettes can be stored on just ...
... one single SuperDisk™ 120MB Diskette.

• Reads/Writes 5 times faster than 2MB Diskettes
• Reads/Writes existing 1MB and 2MB Diskettes up to 2.5 times faster

Capacity

Compatibility
Super Disk™ Convenience for Users

Familiar, easy to use diskette technology

Provides flexibility in media choice

Guarantees interchange with the universally available storage device
  - 1.44 MB floppy

Provides capacity and performance for new applications
  - Color, motion and sound
  - Desktop publishing
  - Image and graphics
  - X-Ray Image Distribution
  - Presentations
## SuperDisk™ Specifications

### 1500 Oersted MP Media

<table>
<thead>
<tr>
<th>Specifications</th>
<th>2MB</th>
<th>120MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formatted Capacity</td>
<td>1.44 MB</td>
<td>120 MB</td>
</tr>
<tr>
<td>Linear Density (max.)</td>
<td>17.4 Kfci</td>
<td>33.6 Kfci</td>
</tr>
<tr>
<td>Transfer rate (max.)</td>
<td>56 KB/s</td>
<td>484 KB/s</td>
</tr>
<tr>
<td>Seek Time (ave.)</td>
<td>90 ms</td>
<td>65 ms</td>
</tr>
<tr>
<td>Track Density</td>
<td>135 tpi</td>
<td>2490 tpi</td>
</tr>
<tr>
<td>Number of Tracks</td>
<td>160 x 2 sides</td>
<td>1736 x 2 sides</td>
</tr>
<tr>
<td>Rotational Speed</td>
<td>300 rpm</td>
<td>720 rpm</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>+5V, 1.5W</td>
<td>+5V, 1.5W</td>
</tr>
<tr>
<td>Drive Dimensions</td>
<td>12.7- 25 mm</td>
<td>12.7- 25 mm</td>
</tr>
</tbody>
</table>
SuperDisk™ Reliability for Global Use

• Lifetime warranty
• Tested to 10,000,000 passes
  Off-load / on-load entire 120MB contents 2 times per week, 50 weeks per year, for 2+ years
• Go-anywhere features, anti-fungal
• Broad operating temperature range 5° - 60°C
  Note: Computers rated to 45°C, Competitive disks rated to 32°C
• Familiar, proven technologies
SuperDisk™ Optical Tracking

1 MB / 2 MB Gap
120 MB Gap

Laser Servo Detector

Top Side

Magnetic Data Tracks
Optical Servo Marks

Permanent Laser Servo Marks

Bottom Side

Magnetic Reference Track
SuperDisk Drive Head Construction

120 MB Gap

1.44 MB Gap
SuperDisk™ Technology

Heads and Disk Layout

- Hub
- Drive Spindle
- Disk
- HD/DD Head
- 120 MB Head

Side 1
Side 0
SuperDisk™ Optical Tracking

- 120 MB
- 33.6 Kfci MP Media
- 2490 TPI
- Zone Bit Recording
- Servo Tracking
- 720 RPM
- 65ms Access Time
SuperDisk™ Optical Tracking

LS-120 SuperDisk™

- Optical Marks
- Magnetic Tracks
- Backward Compatible Head
- LS-120 Head
- Optical Tracking Spots
SuperDisk™ Optical Tracking

120MB Laser Servo Diskette
Closer Spacing → Greater Capacity

120MB Diskette
- 2.2 μm Guard Band
- 8 μm Data Track
- Permanent laser servo marks
- 2490 tracks/inch
- 10.2 μm center-center

1.44MB Diskette
- 120μm Track Width
- 67.5 μm Guard Band
- No servo (open loop)
- 135 tracks/inch
- 187.5 μm center-center
SuperDisk™ Technology

Zone-Bit Recording

1.44 MB
80 Tracks/Side
18 Sectors/Track
9.2KB/Track (512Byte/Sector)

120 MB
1736 Tracks/Side
51 - 93 Sectors/Track
26-47 KB/Track (512Byte/Sector)
SuperDisk™ Technology

• ZONE-BIT RECORDING
  – 55 ZONES PER SIDE
  – MAINTAINS SIMILAR RECORDING DENSITY ON ALL TRACKS
  – ZONE 0, SIDE 1 HAS 93 PHYSICAL SECTORS
  – ZONE 109 ON SIDE 0 HAS 51 PHYSICAL SECTORS
  – ZONES 108 & 109 HAVE SPARE SECTORS
SuperDisk™ Technology

- Dual head design -- transparent compatibility
- Faster spin speeds
- Powerful error correction
  - Interleaved Reed-Solomon code will correct a burst of up to 80 bits - (10 Bytes together) per sector
- Metal particle coating
- High bit density
- Lifetime warranty
What Makes a “Standard?”

• High-quality product that meets a compelling customer need
• Technology and manufacturing framework
• Competitive price and performance points
• Ease of use and adoption
• Universality and non-proprietary technology
• Broad, cross-manufacturer and cross-platform acceptance
Why is SuperDisk the logical new standard in removable media?

- Addresses the limited capacity of the 1.44 MB floppy drive
- SuperDisk protects the value of your legacy media
- SuperDisk has multiple manufacturers (drives/media)
- Meets the interchange requirement for all PCs and platforms
- Provides a very low cost media option
Standardizing SuperDisk: The Technology Framework

- BIOS and native OS support
  - Phoenix, Intel, Award, AMI, etc
  - Windows 95, 98, NT

- Multiple platform availability
  - Full height for desktops
  - True 12.7mm for notebooks
  - PPD, USB and SCSI for external add-on
  - PCMCIA for legacy notebooks

- Multiple drive and diskette manufacturers
  - Mitsubishi, MKE, OR Tech and NEC making drives
  - Imation and Maxell making media
Standardizing SuperDisk: Key Enablers

Operating Systems Support
LS-120 supported by Microsoft
- Windows NT 4.0
- Windows 95 (OSR2) and Windows 98
- Drivers available for Windows NT 3.51 and Windows 3.1

Award, Phoenix, AMI modified their BIOS
- to enable LS120 to be installed as a bootable device

Promise Technology
- Offer “Floppy MAX” bootable, plug and play ATAPI controller.
Why SuperDisk Technology?

• Billions of diskettes still sold annually, emphasizing the need for backward compatibility
  – 4 Billion in 1997 alone.
• 120 MB SuperDisk solves capacity, compatibility, ease-of-use and pricing challenges for the user
• Non-proprietary technology, multiple companies, suppliers involved
• Opportunity to leverage reliability of established diskette technology
• Restores multi-functionality to diskette drive
• CUSTOMERS ARE UNDERSTANDING AND REQUESTING!
SuperDisk: Growth

- March 1997
  - 100,000 Drives Shipped

- March 1998
  - 2 Million Drives Shipped

- 1999
  - 10+ Million Drives to be Shipped
SuperDisk In Our Mobile World

- Large Capacity Drive
- Dual Compatibility
- Ease of Use
- Remote Backup
- Secure Information
- Software Distribution
- Lower Power Consumption

- ONE STANDARD !!!
SuperDisk is Mobile!!

Full size
1″ high
3.5″ FF

Slim line
12.7 MM
Why SuperDisk in the notebook space?

- Constrained space
  - Power/Real estate
- Multi-function device
- Price value vs alternatives
- Match up well with new Pentium II “Thin and Light”
  - IBM 600/770
  - Compaq 7300/7700/7800
  - HP 4100 and 7100
  - Gateway
  - NEC SX
  - Acer
SuperDisk OEM Status

- Growing OEM adoption (43!!)
  - Pentium II notebooks showing strong support
  - Move to slim notebooks require true 12.7 mm height

- Desktop upgrade kits readily available for installed users
  - Hi-Val, USA Identity, Digital Research

- Large SuperDisk conversions developing
  - Ernst and Young (corp. std.)
  - Coopers and Lybrand (corp. std.)
  - Oracle, Price Waterhouse, Motorola
  - FAA, Dept. of Commerce, Air Force Academy
Major OEMs Supporting SuperDisk

IBM  
NEC  
COMPAQ  
Gateway  
Acer  
HP  
And more!
Worldwide OEMs and ODMs that are shipping or will ship SuperDisk

- Compaq
- IBM
- Hewlett Packard
- Gateway
- Acer
- NEC
- Fujitsu
- Hitachi
- Vobis
- Siemens Nixdorf
- American Computer Company
- Enorex Microsystems
- Advanced Technology Group - ATG (Acer Open supplier)
- Trademark Computer Systems
- USA Flex (a Division of Micro Warehouse)
- Systemax
- New MMI Corporation
- D&H Systems Group
- Everex
- Sharp
- Epson
- Toshiba
- Arsys
- SuperComm
- ASI
- Almo
- Epson Direct
- Twinhead
- Tiger Direct
- Midwest Micro
- Quanta
- Compal
- Inventec
- Clevo
- Mitac
- Samsung
- Amptech
- Unicent
- Asustek
- Chicony
- Dual
- FIC
- Kapok
- Fujitsu ICL
SuperDisk Advantages

- One Drive - Two Formats
- Choice of 120MB or 1.44MB
- Easy Back-up and Download
- Lower Support Costs
- Mobility with No Hassle
- Worldwide Availability of Drives & Media
- Durability
- Imation/3M Engineering Tradition
- Environmentally Friendly
SuperDisk development plans

• USB support
  – iMac support initially Aug 1998
  – Wintel support Oct 1998

• PCMCIA support
  – Accurite Available now
  – Addonics Available now

• SCSI support
  – Winstation Available now
Encryption Benefits

• Encryption is the scrambling of information to make it accessible only to specified parties. It requires a key or password for access.

• Information Security/Protection
  – Safeguard sensitive information...e.g. Financial Reports, Strategic Plans, Technical Information, Personnel Data
  – Protect information when you travel from theft or damage/loss
  – Protect large files that are sent via mail/courier/air express
SuperDisk with Secured Encryption Technology

• No separate software purchase(s) required by originator or recipient - Supplied on disk

• Easy to use on Windows 95, Windows 98 and Windows NT with drag-and-drop simplicity
  – Version 3.0 - due for release Sept 98

• Creates a “secured drive” on your SuperDisk that is accessible only by your password

• Save encrypted and non-encrypted files on the same SuperDisk
SuperDisk with Secured Encryption Technology

• Unique encryption product (blowfish algorithm with 64-bit key) carried on a special SuperDisk diskette
  – Very powerful level of encryption!
  – Application and data on same diskette providing unique transport medium
  – Low cost of ownership
  – Simple, intuitive, drag and drop interface
www.superdisk.com
Internet provides complete SuperDisk database
www.superdisk.com

More interactive features

Links to computer manufacturer product sites

On-line promotions
SUPER DISK™

The New Standard in Removable Storage