

The Disk Drive That Ain't

By Ron Dennison

ron@rondennison.com

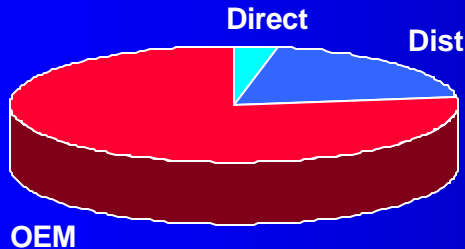
408 929-7023



Different Market

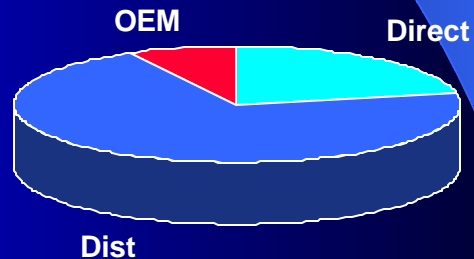
PC - OEM

- Channels are OEM's, Some Distribution, Very Little Direct



Consumer

- Channels are Distribution and Direct Sales, Very Little OEM



Source: Ron's WAG



PC OEM Channel



The Consumer Market



Bradlees

CRITCHFIELD



CIRCUIT CITY



Spiegel

MP SUPERSTORE



VALUE City



SEARS

Outpost



It's Your Money. Get More For It.



ritzcamera



Schnuck's



JCPenney

Fry's ELECTRO



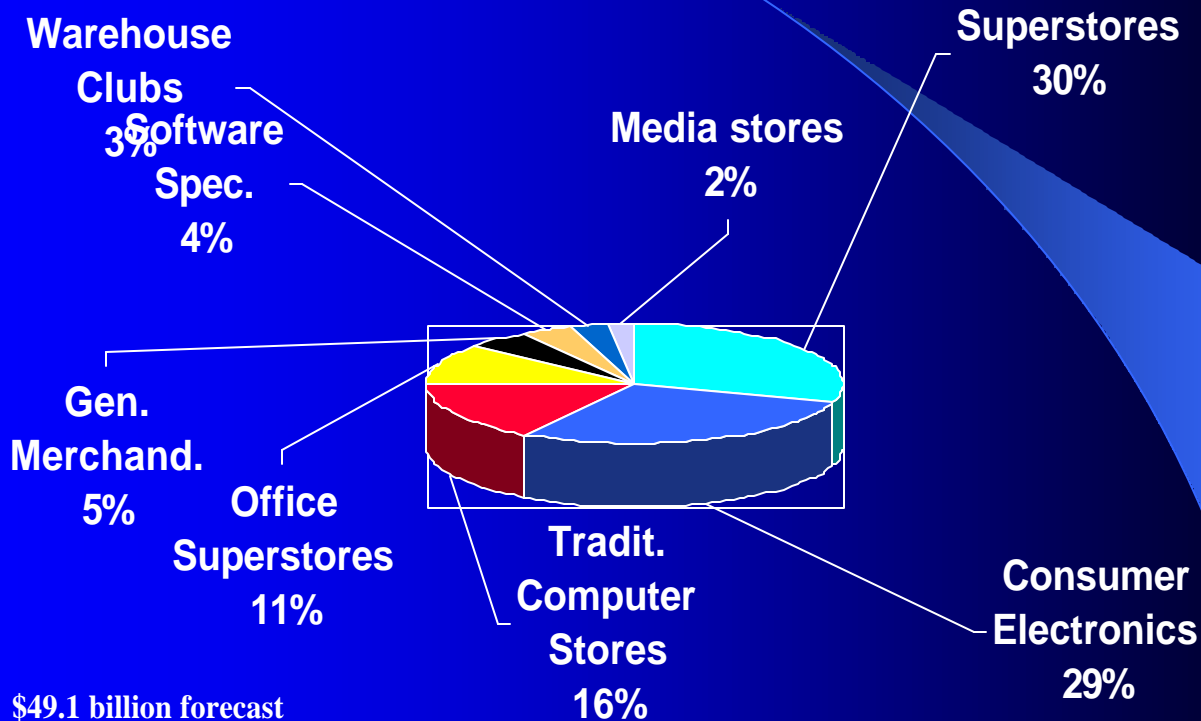
Family Photo & Video

COSTCO



BEST BUY DIGITAL

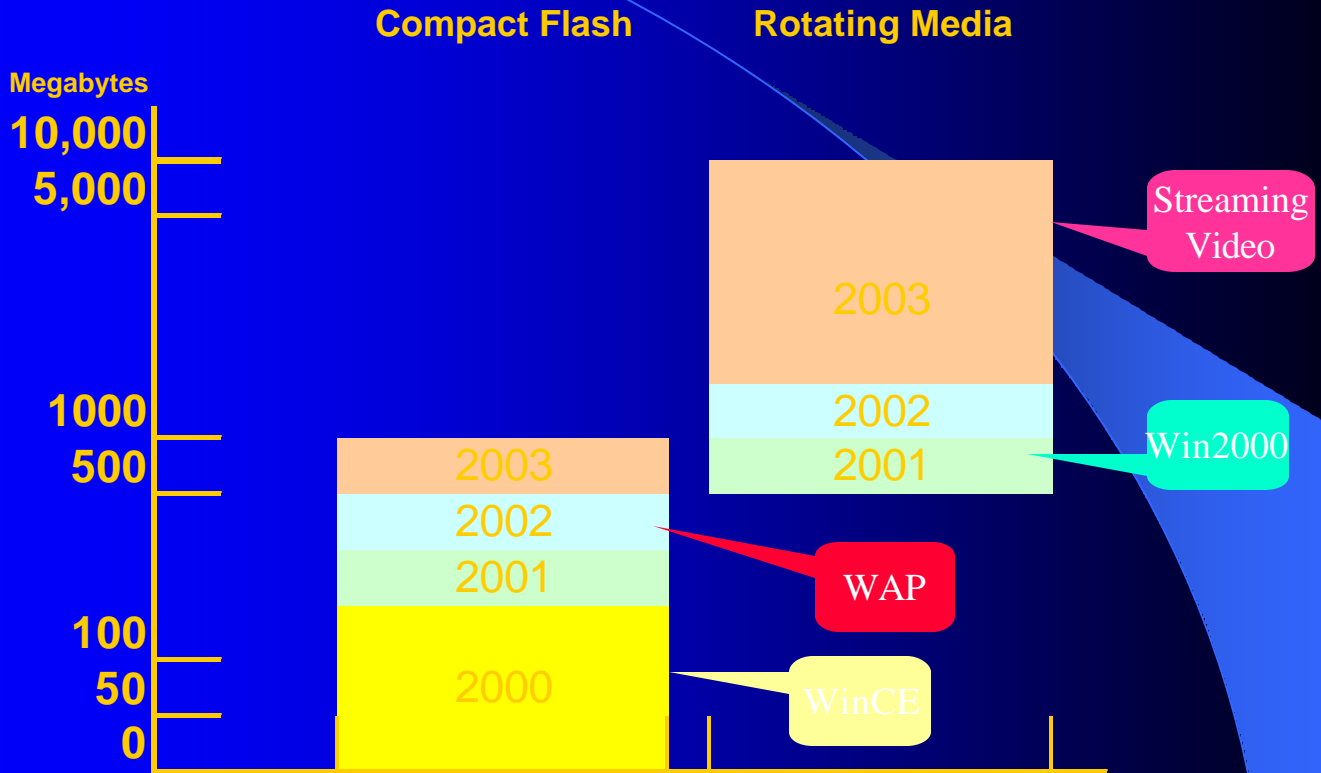
Retail Market Segmentation



\$49.1 billion forecast



Applications for 1" Drives

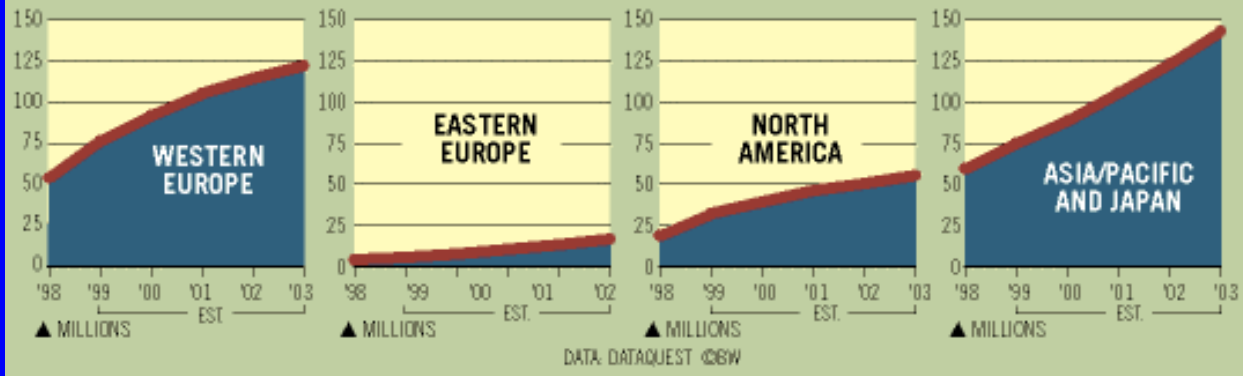


Sources: Sandisk, IBM, O/S Specs



Digital Cell Phones

ACROSS THE GLOBE, DEMAND FOR DIGITAL CELL PHONES IS SOARING



Digital Wallets



- **For People on the Move**
All you need is your digital camera and the Digital Wallet. You can leave your multiple FLASH cards and notebook computer at home.
- **Mass Storage in the Palm of your Hand**
The Digital Wallet can also connect to your PC or Mac for instant back-up storage.
- **Smart Storage**
The Digital Wallet can operate independent of a PC or Mac because it has its own microprocessor, operating system, 2.5-inch hard drive and rechargeable batteries.
- **Holds All Sorts of Files**
Store and organize a wide variety of files such as video clips, digital movies, MP3 files, audio files, large databases, spreadsheets, word documents and presentations



Epson Locatio

PHS cell phone with built-in PDA, camera and GPS. Feature rich!



By itself, the Locatio is a pretty incredible device. The STD model is 3.11 x 1.26 x 5.55 inches (79 x 32 x 141 mm) and **weighs 9.2 ounces (260g)**. The slightly larger COM unit is 3.11 x 1.26 x 6.73 inches (79 x 32 x 171 mm) and weighs 10.2 ounces (290g). The **battery life** for the COM unit is **estimated at 6.5 hours** (assuming in 1 hour the PHS is used for 10 minutes, the GPS is used 3 times and 3 pictures are taken). The battery on the STD unit will last about half an hour longer for similar usage assuming an **external phone** is attached for the 10 minutes of communication time per hour. Both devices take about 4 hours to fully recharge.



Kyocera's Visual Phone

- MMAC prototype in Japan
- Based upon PHS system
- 2 frames per second (great starting point)
- 2 inch reflective TFT color LCD display
- The camera is a CMOS image sensor with approximately 110,000 pixels.
- Built-in video answering machine.



Quartz Communicator



- Next Generation cell phones from Symbian includes...

- Agenda
- Contacts
- To-Do List
- Note taker (Jotter)
- E-mail, SMS, Fax
- Speaker function and voice control
- Sound player
- Word viewer
- Dictaphone



Convergence of Applications!

Two way pagers:
email transceivers



PDA's



Digital Cameras



GPS

Handheld computers



Next
Generation!



Wearable
computers

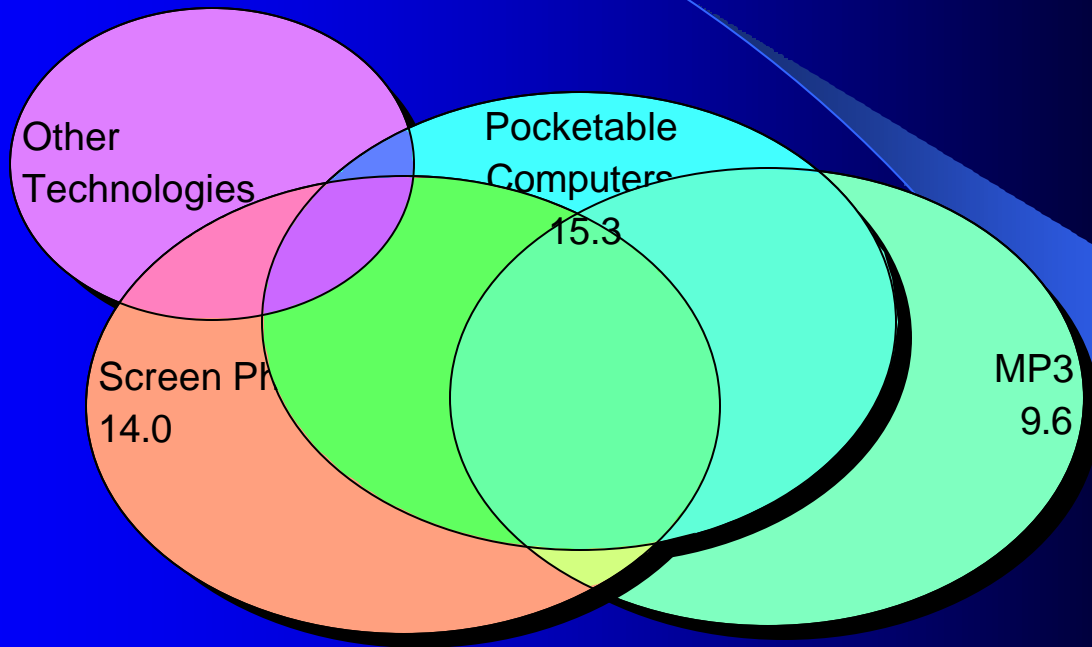
Digital Audio/MP3



Screen Phones



Convergence 2003



Sources: IDC, Dataquest, Byte Magazine



Different Values

PC - OEM

- Price/Platform
- Quality
- Performance Clone
- Execution
 - JIT
 - CRM
 - ETC

Consumer

- Price/MB
- **Reliability**
- **Ease of Use**
 - **Low Power**
 - **Standard Pluggable I/F**
 - **CF I vs. CF II**

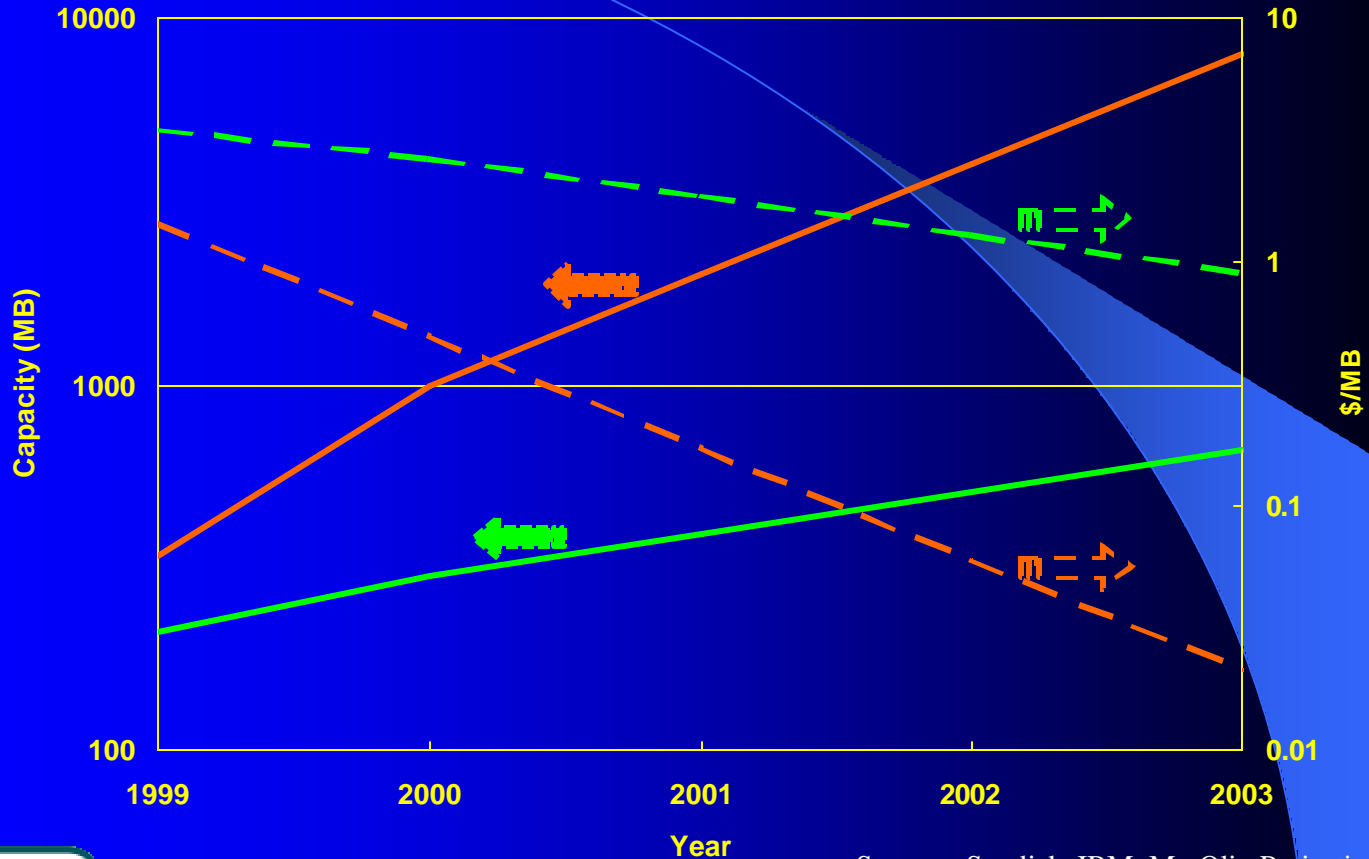


Flash vs. Small Form Factor Hard Disks

	IBM		SanDisk	
	SRP	Per MB	SRP	Per MB
64 MB	N/a		\$169	\$2.64
128 MB	N/a		\$325	\$2.53
192 MB	N/a		\$499	\$2.59
340 MB	\$299	\$1.14	N/a	
500 MB	\$399	\$0.78	N/a	
1 GB	\$499	\$0.50	N/a	



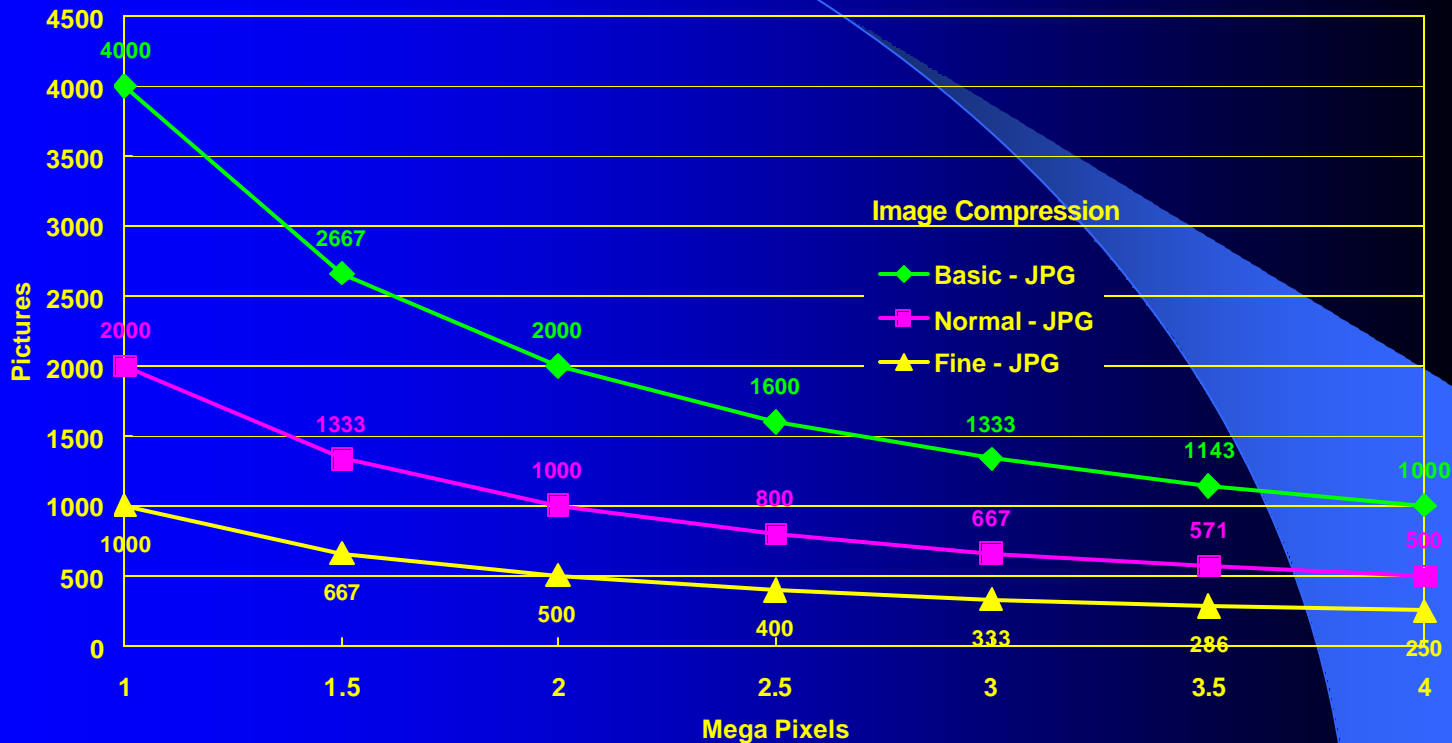
Micro Drive vs. Flash



Sources: Sandisk, IBM, MarQlin Projection



Pictures in 500MB

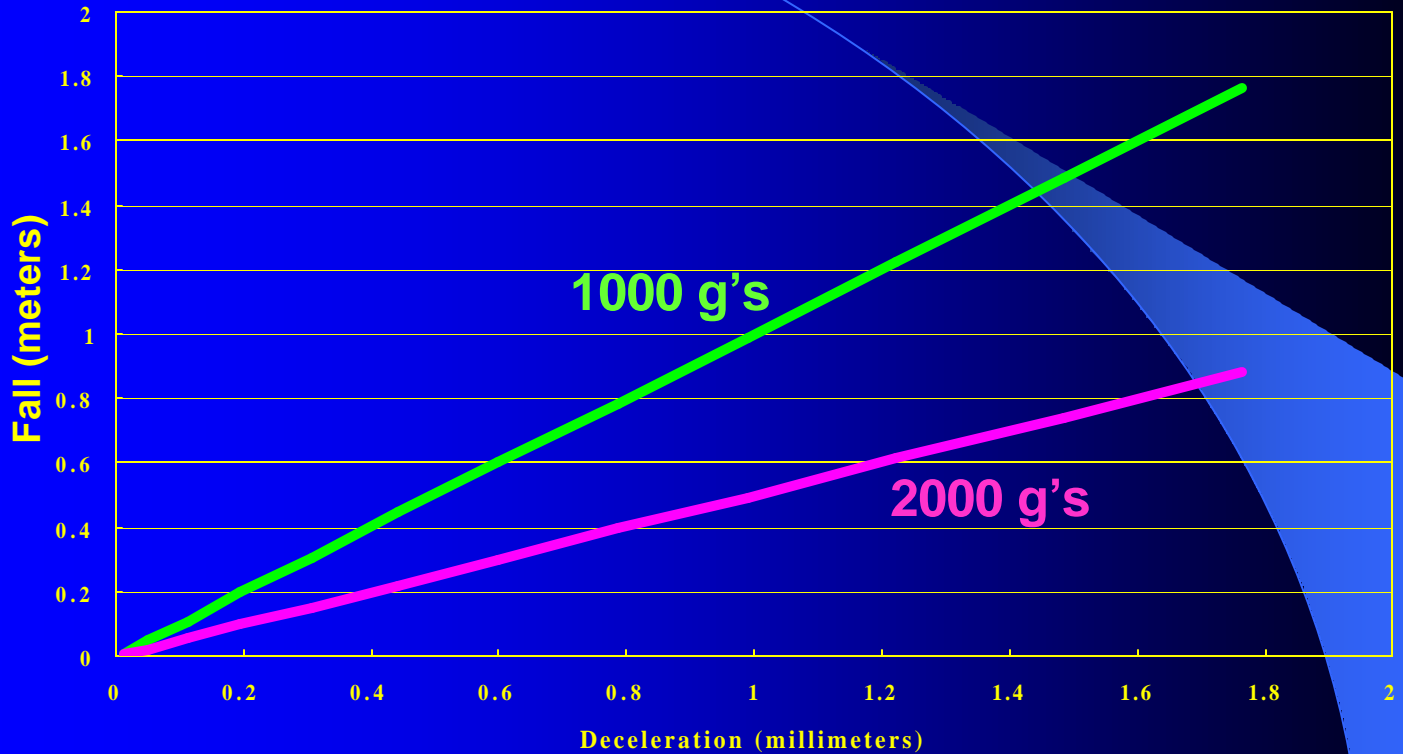


Reliability & Ease of Use

Specification	Original IBM Microdrive	New IBM Microdrives	Percent Change
Non-Op Shock	1000 G	1500 G	50
Operating Shock	150 G	175 G	17
Idle Current	220 mA	140 mA	36
Standby Current	65 mA	20 mA	69
Operating Temperature	5 to 55 C	0 to 55 C	10



Fall vs. Deceleration



Do's and Don'ts

Following the guidelines below will optimize the usage of your IBM Microdrive™:

- Back up your data regularly. IBM cannot be held responsible for possible loss of data.
- Always carry your IBM Microdrive in the plastic case included in this package.
- Do not drop your IBM Microdrive.
- Do not get it wet.
- Do not place it near a strong magnetic field.
- Do not expose it to extreme temperatures.
- Do not squeeze the external covers of the IBM 340/170MB Microdrive
- Do not apply additional labels.
- Do not remove the label.
- Do not write on the label of the IBM 340/170MB Microdrive.
- Do not use in CF+II slots without an ejection mechanism.
- Be careful when removing it from the host device - it may become hot during operation.

Source: <http://www.storage.ibm.com/hardsoft/diskdrdl/micro/dosdont.htm>



Players and Survivors

Players

- Real – IBM
- Wannabe's – Halo, MarQlin, Microstor, MST, Quantum, Toshiba
- Maybe's Seagate, Samsung

Survivors

- Companies that meet consumer values and establish major presences in all consumer marketplaces.



Acknowledgements

- John Fravel
- Art Geffon
- Ken Jacobsen
- Gib Springer

