

# HDD futures

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**Topics:**

**Where are we going:**

**What does it mean:**

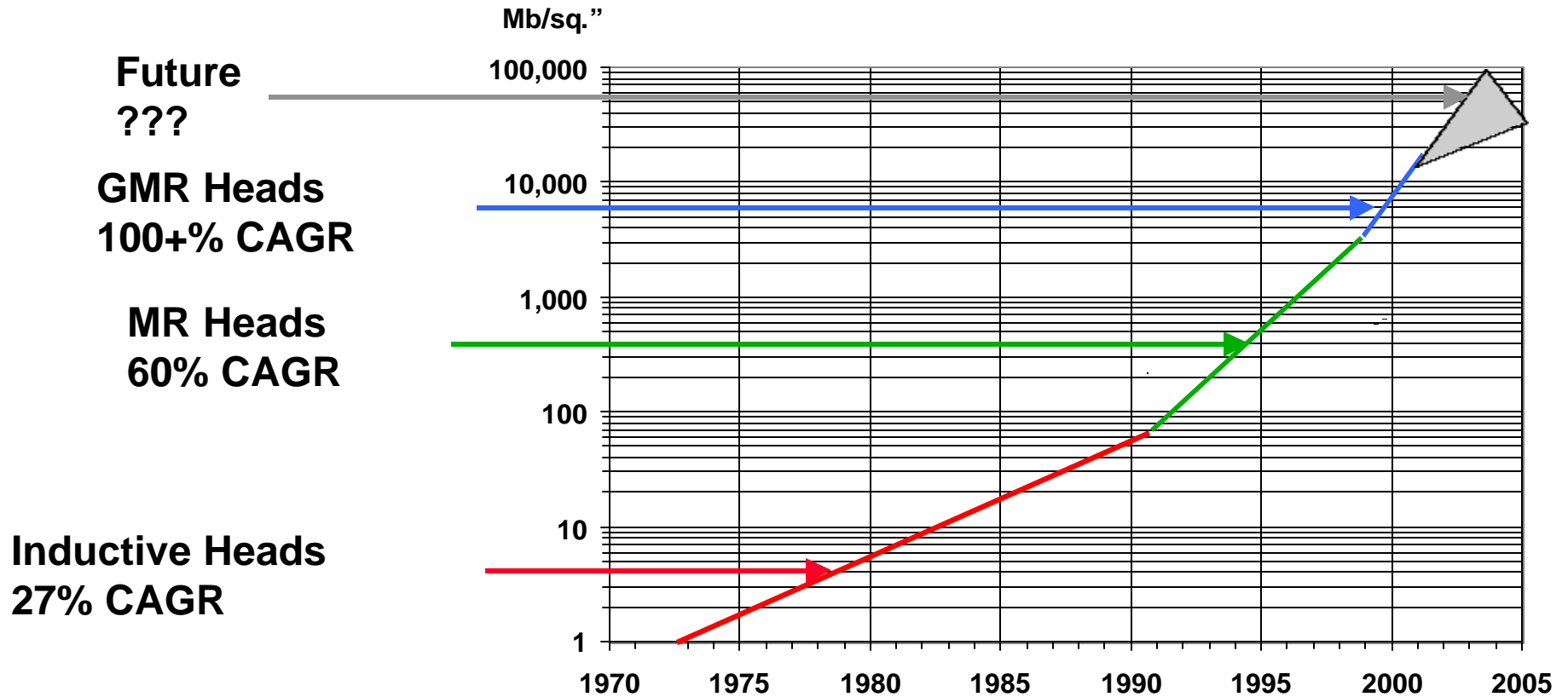
**What is changing:**

*Dave Anderson  
Director,  
Systems Storage Architecture  
Seagate Technology*

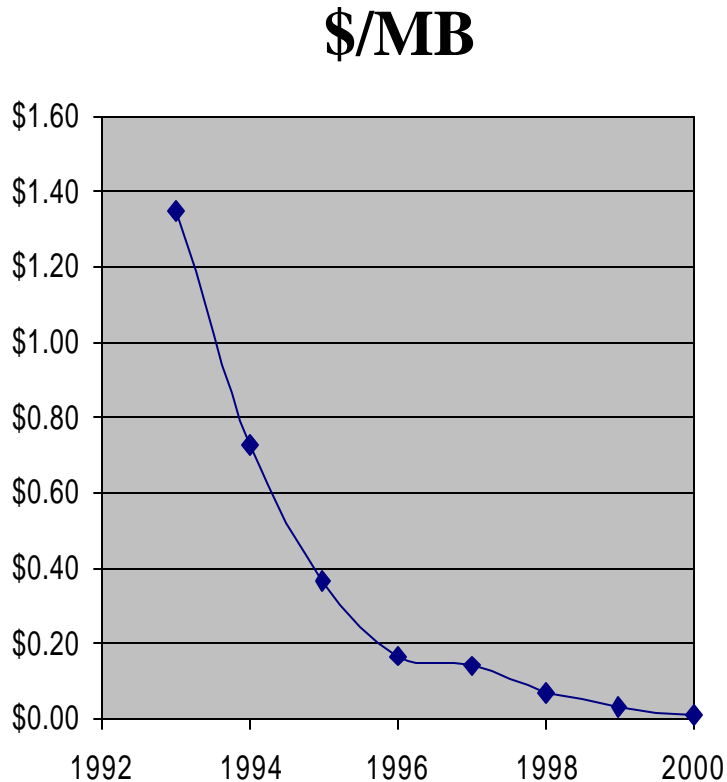
# Areal Density Growth: Accelerating!

## Hard Disc Drive Areal Density Trends

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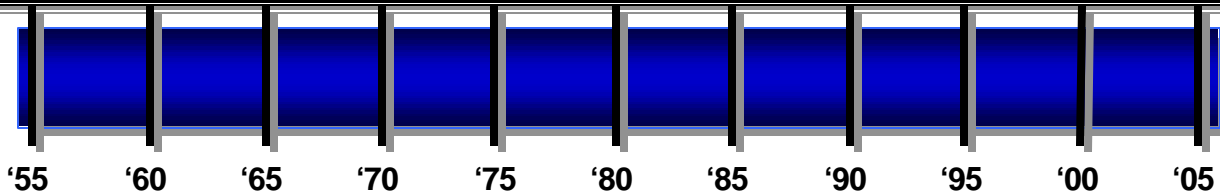


# Where is this Technology Going:

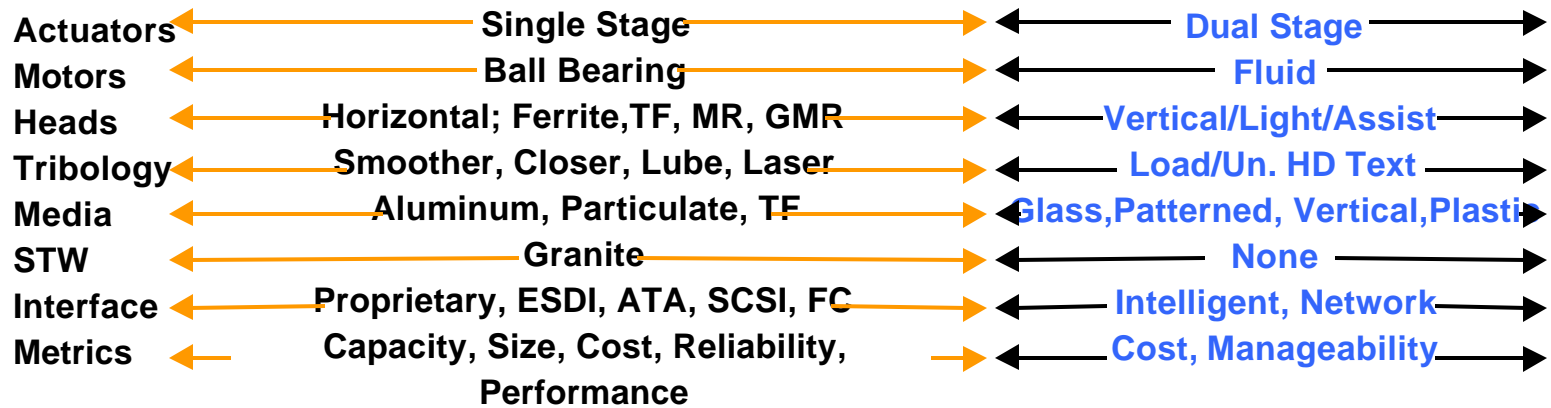


<u>Magazine Date</u>	<u>Retail 1 GB Disc Drive</u>	<u>Discs</u>
Windows 7/93 p. 425:	\$ 1349.00	8
PC Computing 9/94 p. 318:	\$ 729.00	5
April 1995 at Computer City:	\$ 369.00	3
PC Magazine 11/96 p. 386	\$ 169.99	2
PC Computing 11/97 p. 366	\$ 139.00	1
Computer Shopper 6/00 p. 310 <b>* 8+GB</b>	\$ 90.00*	1

# Disc Drives: Big Changes in the Future



RAMAC					
Disc Dia.	24"	÷ 10	2.5"	?	
# Discs	50	÷ 25	2	1	
AD	2000 b/in <sup>2</sup>	x 5,000,000	10 Gb/in <sup>2</sup>	x 10	100 Gb/in <sup>2</sup>
Fly Ht.	1 mil	÷ 1000	.8 uin	÷ 4	.2 uin



# Disc Storage: A New Appreciation

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**Running fast - hard for any technology to intercept**

**Investment level needed is exorbitant**

**Most candidates have faded rather than closed the gap**

**Storage now recognized as the most important IT resource**

**More dedicated effort to manage**

**More architectural focus**

**SAN, NAS, mirroring**

**Uptime key**

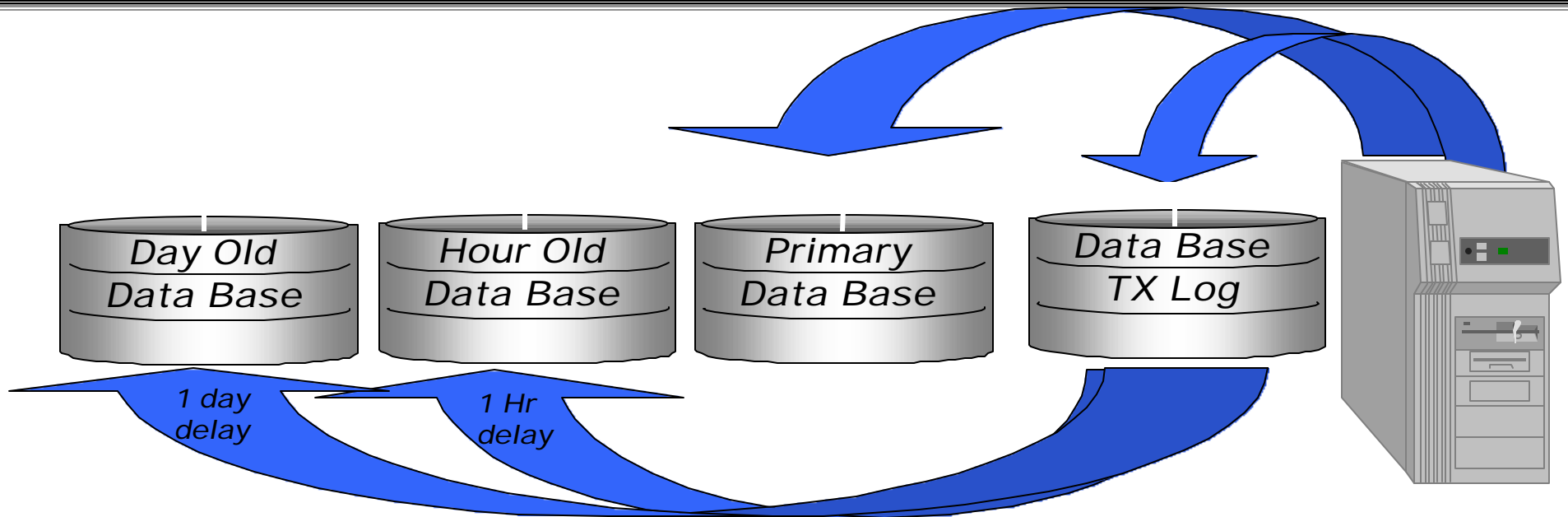
**Backup/restore unworkable (if you have to restore)**

**Disc becoming the new backup (tape still used for archive)**

**Disc recovery faster, Backup to disc more certain**

**Disc can be used to recover from human errors**

# Fast Recovery From Human errors



Barracuda 180 makes lots of copies easy!

- » **Low DM/GB**
- » **Reliable, Fast**
- » **High storage density: 1.8 TB / 3u rack unit**

# Other things are changing

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**Interface set to be challenged on several fronts**

**SCSI - 320, 640 easier than thought, but SE will become a problem**

**Fibre Channel - 2 Gb deploying, 4 Gb underway**

**iSCSI - lot of interest as a SAN**

**InfiniBand - interest as a SAN**

**Serial ATA - Will replace parallel ATA**

**More intelligence in storage devices:**

**NAS - viewed as storage as much as a server**

**DAFS - NFS for SAN**

**OSD - (Object Based Storage) Let storage do more**