



Preface

Special Issue on Hard Disk Drive Technology

A handwritten signature in cursive script that reads "Ichiro Komura".

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The evolution of electronics technology in the 20th century enabled great advances in information systems (i.e., computers, mass storage, and telecommunications equipment), and we are now at the beginning of the broadband information network era. The enormous amounts of information that are generated on the Internet make data storage device technology as important today as data processing and transfer technologies.

At the moment, the IT business is depressed, but IT investment is expected to expand in the foreseeable future. With the explosive growth of e-business, information storage management has become hard work because of the exabytes of new data that are being created annually. Information storage is absolutely critical to the IT market in both enterprise and consumer digital product applications.

In 2000 alone, worldwide shipment of HDDs was enough to store 3 exabytes (EB) of information. If current trends continue, the demand for network information storage will exceed 30 EB in 2005 and 150 EB in 2010. Fortunately, the hard disk drive (HDD) industry has the technological potential to supply every year more than 10 times the total HDD capacity that has been produced and installed so far. Currently, the HDD storage system is the only solution available for storing the bulk of the information stored on the network.

The history of Fujitsu's HDD storage subsystem business started in 1965 with the shipment of the first F631. Later, in 1994, Fujitsu entered the ATA 3.5-inch HDD market for desktop PCs by starting high-volume offshore assembly in Southeast Asia. Since then, Fujitsu has become a vertically integrated manufacturer of HDDs, involved in all aspects from research and development to the manufacturing of key components.

Fujitsu has led the academic world by demonstrating record-breaking densities on a yearly basis: for example, in 1996 we achieved 5 Gbit/in² and in August 2001 we demonstrated the milestone density of 106 Gbit/in².

The HDD is a typical technology-driven device, so advanced R&D is essential for competing in this business segment. HDDs have gone beyond various technological limits and predictions. In fact, the newest commercial models have 18 million times the magnetic recording density of the world's first HDD. Fujitsu has been a front-runner in this progress, for example, by overcoming the so-called physical limit of magnetic recording through elegant breakthrough technologies.

Because of the current slump in the PC market, Fujitsu has decided to exit from its 3.5-inch ATA HDD business and focus on enterprise HDDs, mobile HDDs, 2.5-inch HDDs for desktop PCs, and HDDs for emerging non-traditional applications.

Fujitsu has been shipping its high-performance low-profile AL-7L series enterprise HDDs for heavy-load and multi-tasking applications. The series consists of the AL-7LE (MAN) series, which have a 10 krpm rotational speed and 18 to 73 GB capacities, and the AL-7LX (MAM) series, which have a 15 krpm rotational speed and 18 to 36 GB capacities. All of the devices in this series feature not only high IO performance, but also environment friendly characteristics such as lower power consumption and lower acoustic noise. They also feature Ultra160 SCSI and 2 Gbit per second Fibre Channel interfaces. I believe the AL-7L series will meet the demands for exploding network storage systems.

Fujitsu has started to deliver the HN-15L (MHR) series of 2.5-inch mobile HDDs. These drives are suitable for use in notebook PCs, mobile consumer electronic devices, GPS equipment, audio-video products, and non-PC applications, including blade server applications. The top model of the HN-15L series, the MHR2 AT, has a 40 GB storage capacity with an areal recording density of 36.4 Gbit/in², which makes it the highest density drive available in the world today. The MHR drives incorporate Fujitsu's innovative synthetic ferrimagnetic (SF) media and advanced high-sensitivity read-head technology. The series has been designed to withstand a mechanical shock of up to 900 G by utilizing a head load/unload mechanism and fluid dynamic bearing (FDB) motor technology.

Fujitsu is very proud of its achievements in magnetic storage recording technology and is looking forward to playing an active role in further improvements. The articles in this special issue feature Fujitsu's latest HDD products and Fujitsu Laboratories' leading edge R&D activities. By conducting extensive research and development in magnetic disk drive technology, Fujitsu will consistently supply HDD products that meet the increasingly diverse requirements of customers around the world.