

## Growing World of gigastyle™

### gigastyle™-- Growing World of AV Equipment with Large-Capacity HDD

NISHIURA Masaaki

#### Trends in Development of Compact, Large-Capacity Hard Disk Drives

KITAGAWA Katsuyoshi

The continuous trend of increasing storage capacity and decreasing size of hard disk drives (HDDs) has resulted in an expansion of their applications, from that of a storage medium for desktop computers to more mobile, consumer-oriented applications such as digital video recorders, portable music players, and car navigation systems.

Toshiba has specialized in sub-2.5-inch, small-form-factor HDDs and has consistently led the industry in storage capacity and size reduction. With innovations such as perpendicular magnetic recording (PMR) technology, an annual increase of 30 % in storage capacity is expected, to realize 640-gigabyte 2.5-inch drives and 30-gigabyte 0.85-inch drives by 2010. These technological trends mean that HDDs will continue to play a vital role in Toshiba's "gigastyle™" concept.

#### HDD&DVD Recorder

HIGO Masatoshi / KAMIO Hiroyuki

DVD video recorders have rapidly spread as a replacement for videocassette recorders. Toshiba has continued the development of models combining a hard disk drive (HDD) and DVD since launching the first model in this series, the RD-2000, in 2001.

We have now established a system called RD-Style®, which means to record many programs on HDD and to copy from HDD to DVD using an editing function. The HDD and DVD recording technologies are the crucial aspects of this process.

#### Digital High-Definition LCD TV with Built-in HDD

HATANAKA Shinichi / TAYA Shoichi / TAJIMA Teruo

Toshiba has developed an original high-performance circuit called meta brain™ and is offering digital television sets with the latest picture enhancement technology and next-generation network technology. In addition, after proposing the new "gigastyle™" concept in January 2005, we have developed the LH100 series of digital high-definition LCD TV models incorporating the latest hard disk drive (HDD) technology.

Equipped with a built-in 160 GB HDD, the LH100 features a "time out" function that records scenes so that the viewer will not miss anything if interrupted by an unexpected caller or visitor, and a "news now" function that allows news to be seen at any time simply by pushing a button on the remote controller, in addition to the usual recording and playback functions.

#### gigabeat® HDD Audio Player

HOSHINO Kiyoshi / IZAWA Hidehito

Toshiba introduced the gigabeat® MP3 audio player with an integrated hard disk drive (HDD) in 2002. We have now released the 4th-generation gigabeat® X series in September 2005. Whereas the previous model featured a 2.2-inch high-quality QVGA (240 x 320 pixel) thin-film transistor liquid crystal display (TFT-LCD), the gigabeat® X series has been upgraded by increasing the LCD size to 2.4 inches while achieving greater portability by decreasing the volume of the product by 20 %. In addition, the gigabeat® X series supports music download subscription services, which are becoming the mainstream.

#### gigashot® V10 HDD Movie Camera

KOBAYASHI Hiromichi / KATAGIRI Takato / SASAKI Tomoyuki

In the midst of the fierce competition in the digital still camera business, digital video cameras are adopting a new DVD recording method in place of the videotape method to form a new market.

Toshiba has developed a new hard disk drive (HDD) movie camera, the gigashot® V10, which is equipped with a 0.85-inch HDD and offers "shooting of still pictures and movies anytime, anywhere." Its 5 Mpixel charge-coupled device (CCD) with 5x optical zoom lens and MPEG-2 movie format allows it to take 1,900 still pictures or record 85 minutes of movies. Data can be transferred directly from the camera to a Toshiba HDD&DVD recorder RD Series using its "Net de Dubbing" function. It also has a gravity sensor to protect the HDD.

## Feature Articles

### Gas Turbine Maintenance Technologies

SAKAI Yoshiaki / SAWA Tetsu / OKAMOTO Hiroaki

The number of gas turbine combined-cycle plants is increasing in line with the market demand for environmental preservation and improvement of energy efficiency. Since the hot gas parts of a gas turbine are susceptible to damage such as thermal stress cracks and hot oxidation, such parts must be constantly repaired or replaced. As a result, efforts have been made around the world to develop gas turbine maintenance technologies, including diagnostics and advanced repair technologies.

Toshiba has been developing life assessment technologies, long life technologies, diagnostic technologies, and various other technologies for gas turbine maintenance.

### Low-Noise Fully Enclosed Type Traction Motors

NODA Shinichi / SHIRAIISHI Shigetomo / NAGAYAMA Takashi

Toshiba has been developing fully enclosed type traction motors under a program with the concept of "traction systems harmonized with nature." A technical objective of these efforts is to realize a structure that can efficiently cool the heat generated inside the motor due to its enclosed design.

In the present work to develop low-noise fully enclosed type traction motors, the noise of the outer fan was studied. The irregular-pitch blades of the fan and blade form were improved, and acoustic noise was reduced by 10 dB (A). The cooling structure of the motor was also optimized by heat-flow simulation. As a further measure to solve the temperature issue, a cooling unit was adopted that utilizes the air flow while the motor is running. Sealing of the fully enclosed type traction motor provided a 21 dB (A) reduction in acoustic noise.

### C-Band 150 W-Class GaN Power HEMT

MATSUSHITA Keiichi / SAKURAI Hiroyuki / TAKAGI Kazutaka

Toshiba has succeeded in developing a C-band GaN power high-electron-mobility transistor (HEMT) device with an output power exceeding 150 W. This was achieved by taking advantage of our accumulated GaAs-related technologies; namely, our expertise in semiconductor process technologies and in-depth knowledge of wafer structures and internal matching. A peak output power of 174 W at 6.0 GHz was obtained in a prototype test.

### Business Document Checking System for Compliance

IWATA Seiji

In recent years, compliance-oriented corporate management has become increasingly important to cope with the various risks to which companies are exposed, and the establishment of various laws and regulatory systems has been promoted in this area.

Toshiba Solutions Corp. has developed a business document checking system that checks the contents of a document on the basis of related regulations, in-house rules, and business knowledge and know-how. If any inappropriate item is found, the system will point it out. If the contents of the document contain any risk factor, the system will notify the supervisor accordingly. The quality of the document is also improved in this process.

For compliance, it is essential to prepare correct documents concerning business activities. The business document checking system supports this objective.

### ER-C300 Steam Convection Microwave Oven

TAKEI Tamotsu / OKAMURA Yoshio / TAKAHASHI Yuki

Toshiba has introduced the ER-C300 steam convection microwave oven as a 130th-anniversary model. The ER-C300 features a new steam unit that is capable of generating superheated steam.

This model has the following cooking systems: (1) three types of healthy and appetizing cooking selectable with oven cooking, offering a combination of stone convection and superheated steam cooking; (2) healthy cooking with superheated steam; and (3) full-fledged steam cooking with a large volume of steam.

### Reliability Analysis of Online Trading Systems

TAKEZAWA Nobuhisa / OKUDA Hiroaki / SAKUMA Akira

The online trading system of a securities company is a complicated large-scale information system. Since the failure of such a system will cause serious economic loss, high reliability must be maintained. Hence, from the standpoint of enterprise risk management, it is important for enterprises in this business field to evaluate and improve the reliability of their online trading systems.

Toshiba Corp. and Toshiba Solutions Corp. are developing a reliability assessment and management method for information systems applying probabilistic safety assessment (PSA) techniques used in nuclear power plants. This method is capable of quantitatively evaluating the reliability of an online trading system in terms of both hardware and software. It is therefore effective for the examination and evaluation of reliability improvement measures.

## Frontiers of Research & Development

### DFACE-KM Knowledge Management Methodology

### New Measurement Technique for Alpha Radioactivity

### -- Alpha Clearance Level Monitoring Technique