

# TDK TECHNOFORUM 2000



Welcome!

## *TechnoForum* **2000**

EVERY FIVE YEARS,  
TDK HOLDS A  
"TECHNOFORUM" AT ITS  
TECHNICAL CENTER IN SUBURBAN TOKYO.  
THE 2000 EVENT WAS HELD FROM MAY  
24 TO 26. VISITORS TO THIS MOST  
RECENT "TDK EXPO" SAW TECHNOLOGI-  
CAL ADVANCES NOW BEING COMMERCIAL-  
IZED AS WELL AS IDEAS THAT HOLD  
THE PROMISE OF NEW PRODUCTS MANY  
YEARS FROM NOW. MOST OF THE PRODUCTS  
ON DISPLAY, MORE THAN 160 IN ALL,  
WERE ORGANIZED AROUND TDK'S FOUR  
STRATEGIC BUSINESS FIELDS: RECORD-  
ING, INTERFACES, COMMUNICATIONS  
AND ENERGY. THE FOLLOWING PAGES  
WILL TAKE YOU ON YOUR OWN TOUR OF  
THE TDK TECHNOFORUM 2000.



## RECORDING

### Magneto-Resistive Tunnel-Junction Head

TDK is making progress with research on the next generation of GMR heads: magneto-resistive tunnel-junction heads (TMR). The key advantage of this technology is a magneto-resistive ratio, representing the sensitivity of the heads, approximately three times higher than current GMR technology.

This means TMR heads can accurately "read" signals recorded on hard disks at higher areal densities than currently possible. TechnoForum visitors saw a demonstration of a prototype TMR head. It was made possible by further refinements to the ultra-thin-film and micro-processing expertise TDK honed in the development and commercial production of the GMR head.



Magneto-Resistive  
Tunnel-Junction Head

### High-Performance Head Gimbal Assembly (HGA)

As recording density climbs, each bit of data occupies a smaller area on a disk. As such, heads must be able to move faster and more accurately. TDK's solution is a high-performance HGA. The assembly incorporates piezoelectric micro-actuators in the base and the tip of the head. The greater tracking control accuracy facilitates highly reliable data recording and retrieval. HDD makers are currently evaluating samples of these assemblies. In the near future, TDK plans to start selling models that also incorporate a pre-amplifier chip.





### **Patterned Disk Media**

TDK is developing a new type of magnetic disk that raises recording density by placing each bit of data on its own magnetic "island." Relying upon cutting-edge semiconductor processes, such disks may take magnetic recording technology to its uppermost limits.



**High-Capacity Optical Media**

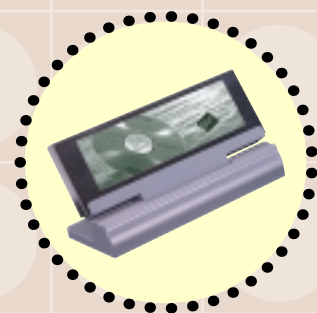
### **High-Capacity Optical Media**

TDK has developed an ROM optical disk that delivers recording density two to four times higher than that of conventional CD and DVD discs without necessitating major alterations to their optical systems. Making this possible are improvements to the pickup's optical system and a super-reflective layer on the disk that yields the requisite signal reflections even when the size of each pit on the disk falls.

## **INTERFACES**

### **Organic EL Display**

The future of small-scale displays, organic electroluminescence (EL) offers many advantages over liquid crystal and other flat-panel displays. Its development demanded expertise in thin-film materials, circuitry, high-density circuit assembly and the synthesis of organic materials. The most distinguishing feature of TDK's display is an extremely vivid white, essential for sharp, colorful images. Furthermore, unlike in liquid crystal displays, no backlighting is needed since EL materials emit their own light. Power consumption is cut dramatically. At the TechnoForum, guests admired a multi-color organic EL display, a technology that will soon be commercialized.



**Organic EL Display**

Welcome to TDK TECHNOFORUM 2000

### Inorganic EL Display

A February 2000 agreement with iFire™ Technology Inc. of Canada forms the basis for TDK's involvement in inorganic EL displays. Inorganic EL is superior to organic EL in terms of brilliance, size and stability. This opens the door to many new applications. Visitors to the TechnoForum were shown a full-color 8.5-inch diagonal prototype.



Inorganic EL Display

## COMMUNICATIONS

### RF Front-End Module for Mobile Phones

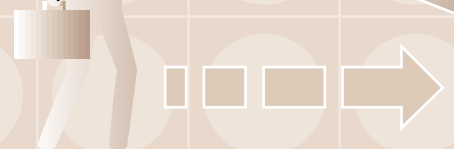
TDK has developed a ceramic multilayer module that places in a single package the high-frequency components essential to the circuitry of GSM/DCS dual-band phones. Handling two bands demands the use of more components. TDK's module has a "footprint" that is about 40 percent less than that of a circuit made of discrete components. TDK plans to go a step further by including a pre-amplifier—a semiconductor device—within the same module as well.



Bluetooth USB Adapter

### Bluetooth™ Components

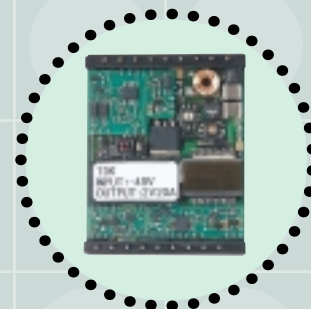
With an eye on the potentially huge Bluetooth market, TDK has unveiled a USB adapter in a PC card format for this new international standard in low-power wireless networks. In another big step, TDK has developed a multilayer ceramic antenna for Bluetooth. Many more innovative products for this format are in the pipeline.



## ENERGY

### DC-DC Converters for Datacom and Telecom Equipment

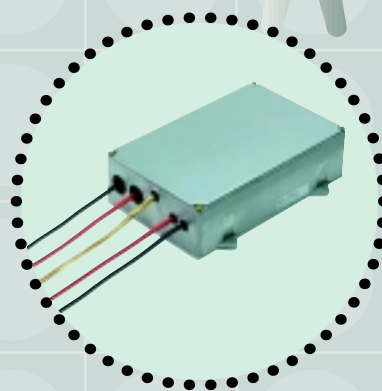
For the base stations of mobile communications carriers, TDK has created a 2V/20A DC-DC converter with a slim profile and efficiency of 90 percent, among the highest available today. Optimal transformer performance is one key, made possible in large part by TDK's experience in low-loss ferrite formulations for transformer cores. Expertise in circuit design also played a part in the unit's sophisticated synchronous rectifier circuitry.



DC-DC Converters for Datacom and Telecom Equipment

### DC-DC Converters for Electric Vehicles

TDK is a leader in the growing market for the DC-DC converters used in hybrid vehicles. Power consumption is low thanks to a high conversion efficiency. Making this possible are magnetic components incorporating new types of ferrite and advanced circuit engineering skills. Next, TDK intends to come up with an even higher performance converter for the next generation of electrically powered cars.



DC-DC Converters for Electric Vehicles



### **In-Car Charger for Electric Vehicles**

As auto makers improve the performance of electric vehicles, opportunities are certain to appear for companies skilled in power electronics. One TDK project in this area is a high efficiency charger with compact dimensions and light weight. The unit maintains stable characteristics over a broad range of input voltages and ambient temperatures, imperative to withstand the rigors that accompany automobile applications. TDK has recently completed a second-generation design that boosts efficiency to 91 percent from the current 84 percent. Further, the unit's weight is lower than that of the current design, lowering fuel consumption.

# Thank You!