

# **EXHIBIT D**

news release



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FOR IMMEDIATE RELEASE

INTEL INTRODUCES WORLD'S FIRST FLASH MEMORY CARD  
SOLUTION TARGETED AT PORTABLE PC ENVIRONMENT

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OCT 22 1990  
D. PASHLEY

FOLSOM, Calif., October 8, 1990 -- Intel Corp.'s Flash Memory Operation today introduced the world's first flash memory-based IC card, available in one- and four-megabyte densities. The card, when used with filing software supplied by independent software vendors (ISVs), such as the Microsoft\* Flash File System (FFS), provides a memory solution that revolutionizes memory architectures in portable PCs. In addition, Intel offers a Flash Memory System Developer's Kit.

"The Intel Flash Memory Card enables OEMs (original equipment manufacturers) to offer a more efficient memory architecture in portable PCs," said Dr. Richard D. Pashley, general manager of Intel's Memory Components Division. "For example, when combined with Microsoft's FFS, manufacturers can design a portable PC using a memory system that was developed specifically for that market, rather than trying to shrink desktop PC memory architectures into a much smaller package."

C/LA

Flash was  
a very good  
--- more ---  
contributor to  
The Tokyo '91  
announcement!  
Thanks for  
persevering!  
10/11/90

news release



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"The flash memory card provides all of the key benefits of mechanical technologies without compromising functionality," Pashley continued. "When compared to the desktop PC memory alternatives -- floppy and hard disk drives -- the Intel Flash Memory Card offers lower power dissipation, lighter weight and ruggedness...the ideal solution for the portable notebook PC of the '90s."

Also, the flash memory card allows end-users to store, update and transport application code and data files on an inherently nonvolatile memory media that is more reliable and higher performance than mechanical disk drive technology.

To enable the system designer to evaluate and implement this system into next-generation laptop, notebook and palmtop computers, Intel provides a Flash Memory System Developer's Kit. The kit includes a flash memory card, an IBM PC AT/XT\* memory card interface board, an evaluation copy of Microsoft's FFS software, source code for installable drivers and application documentation.

#### Flash Memory Card Applications

There are three key portable PC application areas for the Intel Flash Memory Card: updatable application code, application code and data file storage, and data acquisition.

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In the updatable application code environment, the need is for a low-cost and high-density reprogrammable memory solution that can be modified to store off-the-shelf and custom software for short periods of time. Space constraints in ever-shrinking portable PCs prohibit effective use of floppy or hard disk drives, while the flash memory card is ideally suited for this smaller form factor.

For application code and data file store usage, the Intel Flash Memory Card makes transportability of code and data files simple. The user can download application software and data files from a desktop PC into the memory card, using a card drive like the Databook ThinCard Drive\*, and transport them to a portable PC. While away from the office, the user creates and updates data files and, upon returning, uploads these files via the card into the desktop PC for future use.

The data acquisition application is targeted at a dedicated system where critical data cannot be lost. Here, the Intel Flash Memory Card can be used to record, store and transport this critical data to another medium for statistical processing. Heart monitoring equipment, factory floor automation systems, navigational flight recorders and mobile data terminals are but a few examples of these dedicated systems.

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Intel Flash Memory Card Features

The Intel Flash Memory Card is based on an array of the company's recently introduced high-density ETOX™ II (EPROM Tunnel Oxide) Flash Memory devices in TSOP (thin, small outline package). Aligned back-to-back in a serpentine layout, the flash memory devices provide up to four-megabytes of data and code storage on a single card. As such, the Intel Flash Memory Card is the highest capacity nonvolatile reprogrammable IC card available today.

In addition, the read/write capability and nonvolatility of the flash memory card provide a longer lasting, more reliable storage medium than mechanical disk drives. In reliability terms, the all-silicon flash memory card provides more than one million hours mean time between failure (MTBF) versus 50,000 hours typical MTBF for mechanical disk drives.

The flash memory card supports the PCMCIA/JEIDA (Personal Computer Memory Card International Association/ Japan Electronic Industry Development Association) standard 68-pin connector, allowing transportability between portable and desktop PCs, and is JEIDA 4.0 compatible. The card measures 85.6mm X 54.0mm X 3.3mm, equalling the length and width and only four times the thickness of a credit card.

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Other features of the flash memory card include a 250 nanosecond read access time, a two-second (typical) per 256 Kbyte block erase for the 4 Mbyte card, a one-second (typical) per 128 Kbyte block erase for the 1 Mbyte card, a write-protect switch to prevent accidental file or code deletion, and a command-register architecture for microprocessor/microcontroller compatible write interface.

#### Pricing and Availability

The one-megabyte Intel Flash Memory Card, the iMC001FLKA, is priced at \$298 in 1,000 piece quantities. The four-megabyte iMC004FLKA is \$1,198 in 1,000 piece quantities. Samples are available now with volume production to begin in December. The Flash Memory System Developer's Kit, also available in December, is priced at \$499.95. For pricing and availability outside the U.S., contact the appropriate Intel international sales office.

Fujitsu Ltd. will also source Intel's PCMCIA/JEIDA standard 68-pin flash memory card.

For additional information on the Intel Flash Memory Card, contact a local Intel Sales Office, or call (800) 548-4725 in the U.S. or Canada, or write for: Intel Literature Packet #A6P29, P.O. Box 58130, Santa Clara, CA 95052-8130.

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Intel's Flash Memory Operation manufactures a complete line of rewritable flash memory products for applications requiring high quality, high performance, reliable and cost-effective code storage and update flexibility.

Intel is an international manufacturer of microcomputer components, modules and systems.

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