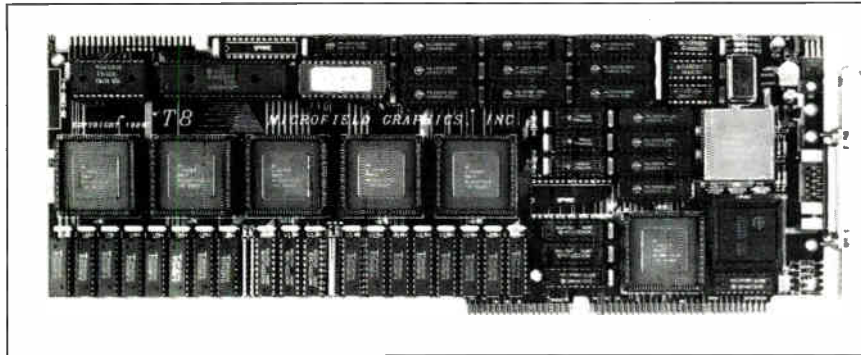# GRAPHICS CARD SWAPS WINDOWS LIGHTNING FAST

ZIP COMES FROM MICROFIELD GRAPHICS' CMOS ENGINE; HIGH-RESOLUTION CARD ALSO DISPLAYS 256 COLORS

FIRM HOLD. Graphics card eliminates jerky motion when roaming large image data bases.

A general-purpose bit-manipulation computing engine called the Blit-slice dramatically speeds up the job of moving blocks of pixel data. Mounted on a high-performance, high-resolution graphics card for the IBM Personal Computer AT, it redraws graphics windows so fast they seem to pop instantaneously onto the screen. Users can also roam inside a large image data base without the jerky image movements characteristic of many systems. The Blit-slice is implemented in CMOS gate arrays.

Microfield Graphics Inc.'s T8 card brings this engine together with enough 1-Mb DRAMs—2 megabytes' worth—to accommodate eight graphics planes at a resolution of 1,280 by 1,024 pixels. The eight planes allow up to 256 colors to be displayed at once.

BIG HELP. The T8, which also carries its own 16-by-16-bit multiplier chip and a bit-slice drawing and emulation engine, can offload many tasks from the host processor, balancing the load in the graphics pipeline and eliminating processing bottlenecks. The board can handle data-transfer, command-interpretation, drawing, and window-manipulation operations, as well as image transforms, scaling, and clipping.

Technology advances on several fronts have made it possible for PC-based hardware priced at $10,000 or less to encroach on applications now claimed by costly high-end graphics systems, says Samuel Mallicoat, president of Microfield Graphics. The arrival of low-cost, high-resolution color monitors from NEC, Hitachi, and Mitsubishi is one major factor, he says. The growth in PC power is another, along with the availability of 1-Mb DRAMs.

The T8 fits into this trend, thanks to the performance and resolution it provides, but perhaps more importantly because of its high degree of application flexibility. The card is based on the microcode-driven architecture of the 2901 bit-slice processor family from Advanced Micro Devices Inc., so new microcode can be loaded into RAM to suit each application.

This flexibility allows the T8 to bring graphics-based applications to the PC AT from three different directions. The T8 can handle software adapted from programs running on personal computers, on work stations such as those from Sun Microsystems or Apollo Computer, and on high-end graphics systems using minicomputer or mainframe hosts and elaborate graphics terminals like the Tektronix 4125 or the IBM 5080. Applications thus can range from simple business graphics and computer-aided design, engineering, and manufacturing, to highly detailed mapping work.

Standard software for the T8 allows it to emulate IBM's Color Graphics Adapt-er—the first-generation graphics card for the PC—and also the IBM Enhanced Graphics Adapter, the higher-resolution card that is rapidly becoming a standard for PC graphics. The T8 is said to be the first AT-compatible card with its level of resolution to offer EGA emulation.

The card's standard software interface is a superset of the American National Standards Institute's Computer Graphics Interface definition. Enhancements facilitate window and text manipulation and the use of bit planes as logically separate drawing surfaces.

EASY CUSTOMIZATION. Primitives in the T8's standard software are fast enough for more than three-quarters of the applications currently being adapted to the board at beta sites, says Mallicoat. Furthermore, the command set can be easily customized with new microcode, and a programming tool kit and simulator are available.

Microcode can be developed, for example, to allow in-window emulation of graphics devices that are not already supported. And as processing bottlenecks are identified, microcode can be written to allow the T8 to help with specific tasks that relieve those bottlenecks.

One of the tools translates software that has already been adapted to the company's T4 graphics card, the T8's predecessor. P-CAD and Valid Logic are among the vendors of programs that currently run on the T4.

Three gate arrays were developed for the T8: a bus interface chip, another for address generation, and a third chip, four of which form the 64-bit-wide Blit-slice processor. Mallicoat credits these CMOS chips, along with the use of standard DRAM instead of video RAM, with keeping the board's power consumption down to 2.5 A at 5 V.

The T8 costs $4,500 in single units. Samples will be available by the end of the year; production quantities will be available in January. –*Jeremy Young*

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FLOPPY DISK DRIVE PACKS 10 MEGABYTES

By boosting capacity from 1.2 megabytes to 10 megabytes, floppy disk-drive makers are giving tape drives competition as the primary means of file backup for Winchester hard-disk drives on the IBM Personal Computer AT. The most recent entry is Konica Technology Inc.'s KT-510 half-high 5¼-in. drive that stores 10 megabytes unformatted on the 600-oersted floppy disk used by the IBM AT and compatibles. It will read—but not write on—IBM PC AT floppy disks.

The big boost in capacity means that the KT-510 can supplant more expensive tape drives as a backup for the PC AT. High-capacity floppy drives are not entirely new, but the competition is heating up. Eastman Kodak Co. introduced a 10-megabyte product based on 600-Oe media last year [*Electronics*, Nov. 25,