



## Convergent Technologies

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**NEWS NEWS NEWS NEWS**

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### GROWS FROM 8 TO 128 USERS IN FIELD

CONVERGENT MEGAFRAME<sup>TM</sup> USES NEW MULTIPROCESSOR DESIGN  
TO LET MULTIPLE OPERATING SYSTEMS SHARE ALL RESOURCES

SANTA CLARA, Calif., May 3, 1983 -- A computer system that is field-upgradable from an eight-user super-minicomputer to a 128-user mainframe, and that supports dual operating systems sharing all resources, has been introduced by Convergent Technologies.

Convergent's MegaFrame<sup>TM</sup> uses a unique new multiprocessor architecture that allows the OEM to start with a small system for under \$20,000 and add specialized processing units as needed -- up to a total of 36 processors. At its upper-level configurations, the MegaFrame can support up to 128 users, 24 megabytes of error-correcting (ECC) RAM and 21.6 gigabytes of external disk storage.

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This architecture also permits multiple operating systems -- both Convergent's own real-time CTOS<sup>TM</sup> and a distributed virtual-memory version of UNIX<sup>TM</sup> -- to share system resources transparently to the user or application.

According to Steven Blank, marketing manager for Convergent's Data Systems Division, "the MegaFrame will put our OEMs and system house customers in the enviable position of making companies like DEC, Data General and Hewlett-Packard play catch-up with them."

Designed to meet the wide range of processing needs in a large organization, the MegaFrame lets the user mix and match "dumb" RS232C terminals, Convergent workstations, and new Convergent PT<sup>TM</sup> terminals, which feature high-speed communication of 307K bits per second.

Blank said the MegaFrame's range of performance and expandability is made possible by a new hardware and software architecture that represents "the latest step in the evolution of distributed intelligence."

The MegaFrame links up to 36 board-level processing units working in parallel on a high-speed 32-bit system bus. Systems can grow simply by plugging additional processors into each enclosure; when all six card slots in the first enclosure are full, expansion enclosures are added. The maximum six-enclosure system offers 36 card slots, and supports up to 1.15 GB integral disk storage and 21.6 GB external SMD storage.

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"The simple addition of new processors and chassis units solves the problems of both upgrade overkill and system obsolescence," Blank said. "As the user's needs change, the system grows with him. He never pays for more system than he needs."

Each processor in the MegaFrame contains 0.25 to 4.0 MB of RAM and its own copy of operating system software. A given processor handles one of four specialized functions.

--the Application Processor, the heart of the MegaFrame, runs all application programs under a virtual-memory version of UNIX. Up to 16 such processors can be installed, making possible performance of 8 MIPS (millions of instructions per second).

--the File Processor, functionally equivalent to a back-end data base processor, is devoted to executing the file system and file-oriented programs. It handles disk-access requests from the other processors. It controls up to four Winchester-type storage devices: three 5-1/4-inch 50-MB drives and a removable 5-MB cartridge in the first (or "master") system enclosure; and four more drives in each expansion enclosure. A system may contain up to eight parallel File Processors.

--the Cluster Processor, functionally equivalent to a front-end communications processor, controls two multi-drop RS-422 ports and can run terminals at 307K bits per second, accommodating Convergent workstations and high-speed PT



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terminals on the same cable; it also supports three RS-232 ports and a parallel printer port. Up to 16 Cluster Processors can be installed.

--the Terminal Processor, functionally equivalent to a front-end communications processor, has 10 serial RS-232 lines each operating at up to 19.2K bits per second. It can support any device with a standard RS-232 interface. Up to 16 can be installed.

Both the Terminal and Cluster Processors support a variety of communications protocols including SNA, 3270, X.25, bisynchronous 3270 and 2780/3780.

Three of the four processor types -- the File, Cluster and Terminal Processors -- run the CTOS operating system. The Application Processor runs the UNIX operating system kernel and is based on the 10-MHz Motorola 68010 virtual-memory processor.

The MegaFrame's architecture, Blank said, eliminates traditional shared-logic bottlenecks by letting the user configure a system with the appropriate number of processors of each type. The right combination of types depends on whether the application mix is CPU-intensive, terminal-intensive or I/O-intensive.

"Each of up to 36 processors is running its own operating system, but all are executing in parallel," he said. "At the

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same time the Application Processor is executing application programs, the File, Terminal and Cluster Processors are all handling their respective functions."

MegaFrame uses a fully distributed, virtual-memory implementation of the UNIX operating system. Convergent has made several enhancements to the UNIX software while maintaining complete compatibility for application programs. Among these enhancements are virtual memory; access to CTOS-supported services and real-time applications; forced updating of disk at file closure for increased reliability; and offloading of terminal handling from the main processor onto the Cluster and Terminal Processors.

UNIX-based languages supported on the MegaFrame are COBOL, a BASIC compiler and interpreter, full FORTRAN 77, Pascal and C.

CTOS, which controls the File, Terminal and Cluster Processors as well as an optional SMD Processor, supports the execution of high-performance real-time software: communication programs (X.25, SNA, 2780/3780 and 3270 emulation); and CT-ISAM, for multi-user access to common information.

Also available as an option is the MegaFrame Office Systems Package, an easy-to-use set of office software tools that runs on Convergent workstations and PT terminals. The package's multi-window display lets the user manipulate

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multiple applications on the same screen, moving information among word processor documents, financial spreadsheets, electronic mail, query and other functional components.

Designed for the office environment, each MegaFrame enclosure measures 29 x 16 x 28 inches, about the size of a two-drawer file cabinet. The first enclosure in each system contains an operator panel, 1-3 50-MB disk modules, and a 5-MB removable backup module; each of up to five expansion units holds 1-4 disk modules.

Future plans call for the system to add support for 100-MB and 145-MB 5-1/4-inch Winchester drives, and for the Motorola 68020 32-bit virtual-memory processor.

The MegaFrame will be available beginning in August 1983. Pricing for small OEM quantities of three sample MegaFrame configurations is as follows:

CG-8110 (8 users, 0.5-MIP performance): \$17,546.  
Single-enclosure system includes 1 MB ECC RAM, one File Processor, one Application Processor, one Cluster Processor, one 50-MB Winchester disk drive, one 5-MB removable Winchester cartridge drive, one PT terminal.

CG-8220 (32 users, 1.0-MIP performance): \$46,841.  
Dual-enclosure system includes 4 MB ECC RAM, two File Processors, two Application Processors, two Cluster Processors, four 50-MB Winchester disk drives, one 5-MB removable Winchester cartridge drive, one PT terminal.

CG-8530 (128 users, 4.0-MIP performance): \$110,250.  
Five-enclosure system includes 15.25 MB ECC RAM, one File Processor, eight Application Processors, eight Cluster Processors, two 50-MB Winchester disk drives, one 5-MB removable Winchester cartridge drive, one PT terminal. Supports 3.6 GB external mass SMD storage.

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For more information, contact Steven Blank at Convergent Technologies, 3055 Patrick Henry Drive, Santa Clara, California 95051, (408) 980-0850.

Convergent Technologies was founded in 1979 to manufacture advanced computer systems based on multi-functional workstations. The Data Systems Division, formed in 1982, makes and markets the MegaFrame, the first system upgradable from super-minicomputer to mainframe performance levels. Convergent markets its products to computer manufacturers, OEMs and system houses. The publicly-held firm closed fiscal 1982 with \$96 million in sales.

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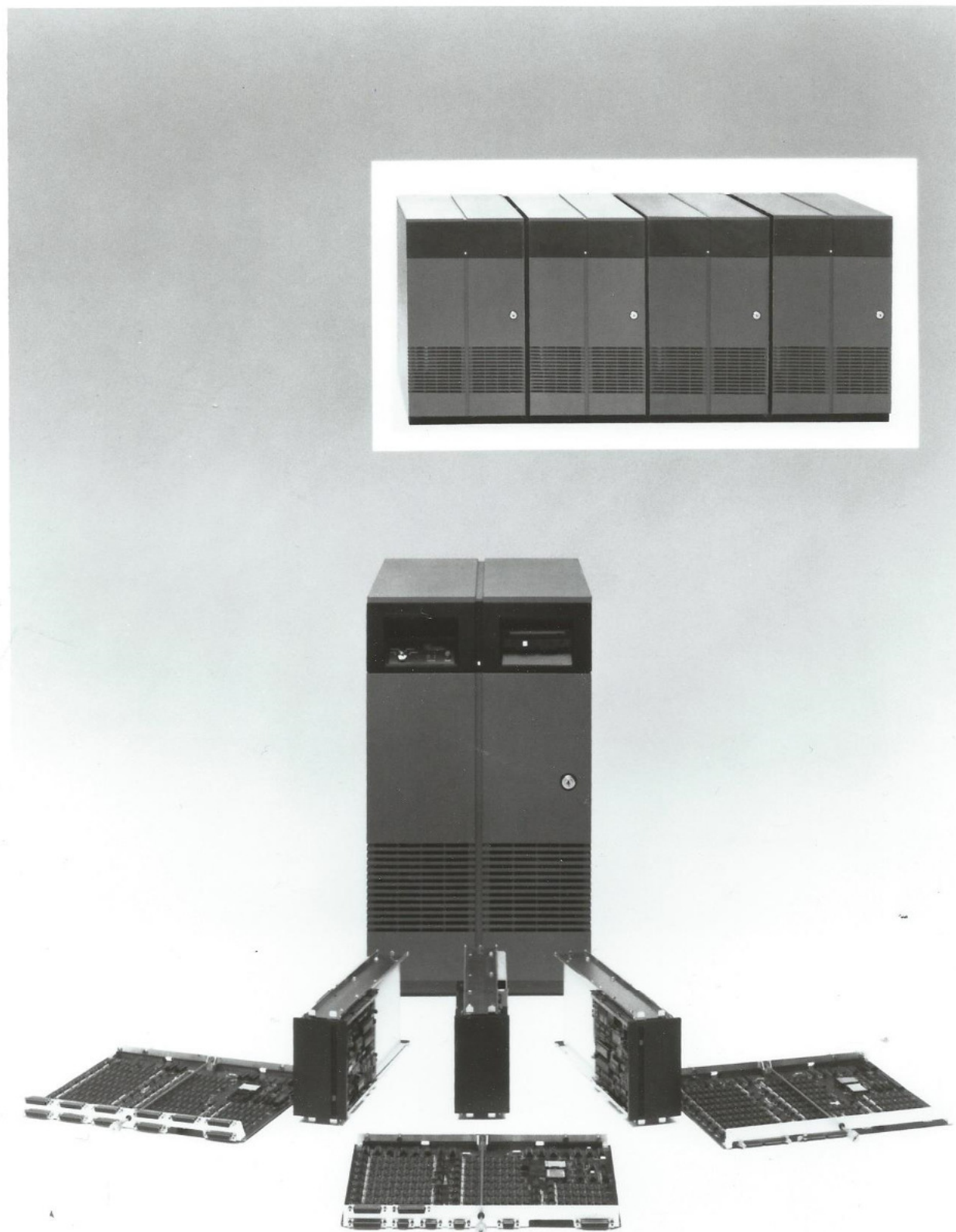
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CONVERGENT'S MEGAFRAME STARTS WITH A COMPACT UNIT IDEAL FOR THE OFFICE ENVIRONMENT; UP TO FIVE MORE SUCH UNITS CAN BE ADDED IN THE FIELD.





CONVERGENT TECHNOLOGIES' MEGAFRAME GROWS EASILY FROM 8 TO 128  
USERS BY ADDING MULTIPLE PROCESSOR BOARDS AND SYSTEM ENCLOSURES.