



## HARDWARE

- Powerful 32-bit Minicomputer supporting up to 42 terminals
- Industry Standard UNIX™ System V, Release 2.2 operating system with 32 MB demand-paged virtual memory
- Motorola 68020 microprocessor operating at 12.5 MHz
- Optional MC 68881 floating point processor
- Optional 4-14 slot VME bus
- 1 MB RAM expandable to 16 MB in 2 MB or 4 MB increments
- Up to three integral 5¼-Inch, 50 MB or 85 MB Winchester disk drives
- Optional SMD storage from 300 MB to 2.5 GB
- 2 to 42 RS-232 ports operate at speeds up to 9600 bps
- Expansion slot for optional communication board:
  - RS-232 Accelerator
  - 4-Port RS-422 board
- Centronics-compatible parallel printer port
- IEEE 802.3 compatible Ethernet board
- Object-code compatibility with MiniFrame™, MiniFrame Plus™, and MegaFrame™
- Programming languages include COBOL, BASIC, FORTRAN, Pascal, C, and source level debuggers
- Extensive data management facilities

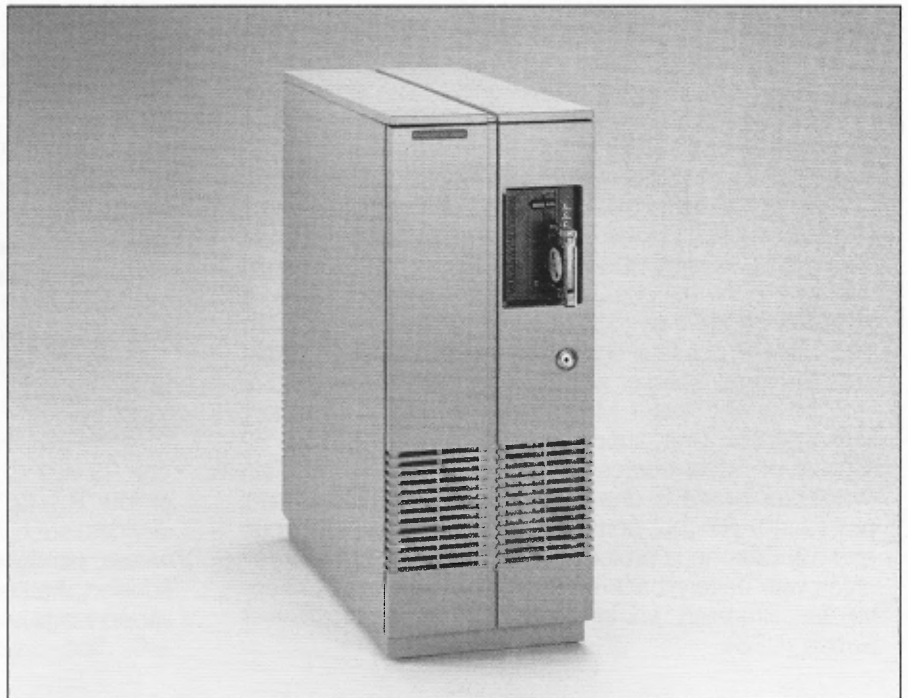
# CONVERGENT TECHNOLOGIES

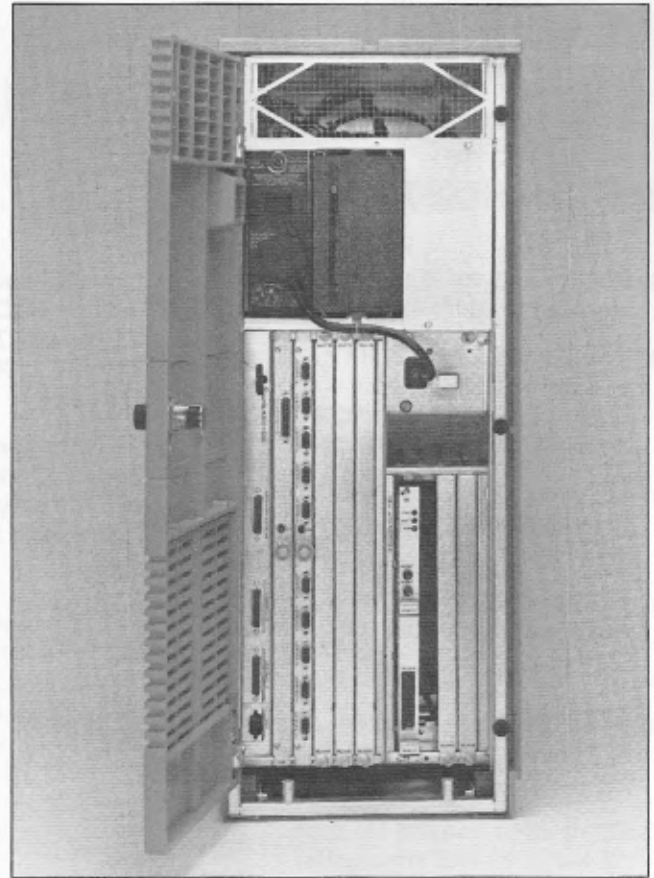
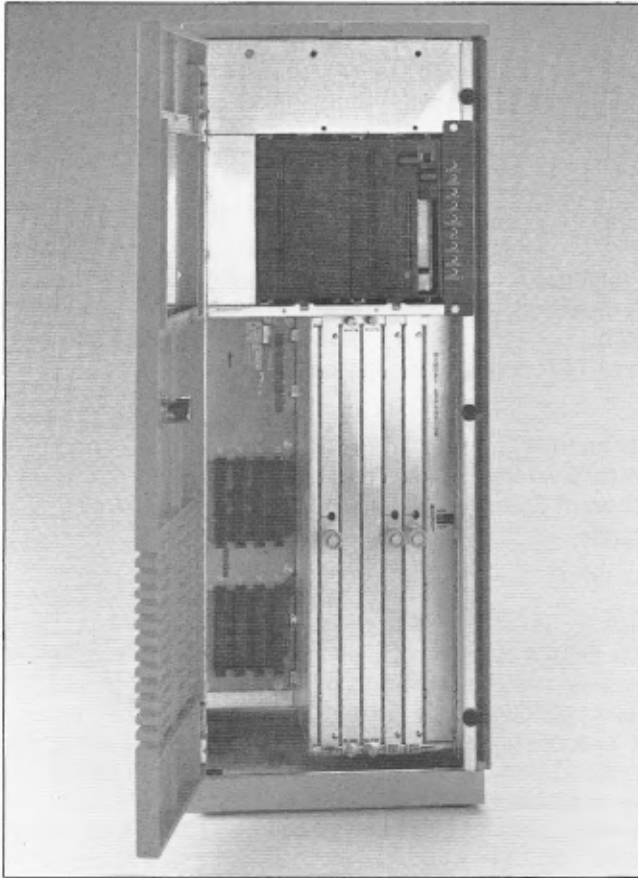
## MightyFrame™ Overview

- Communications facilities include BSC 3270 Terminal Emulator, 2780/3780, SNA 3270, X.25, and TCP/IP via Ethernet
- Development tools include the Source Code Control System and full screen program Editor, Linker, and Debugger
- Office Applications include Word Processor, Financial Spreadsheet, and GKS™ graphics libraries
- Window Manager supports a multi-window, multi-application environment for PT™ and GT™ terminals

The Convergent™ MightyFrame™ is a high performance, 32-bit minicomputer, based on the Motorola 68020 microprocessor and UNIX System V, Release 2.2. It supports a total of 42 interactive devices, which can be any combination of Convergent PT™ and GT™ terminals, as well as standard ASCII terminals. MightyFrame has the processing power to support sophisticated office automation and data processing tasks, and can also act as a network server. With the addition of readily available UNIX-based software and VME-based hardware, MightyFrame is well suited for laboratory, factory and design automation tasks.

Easily expandable, the MightyFrame can grow from a dedicated single-user workstation to a powerful multi-user system with up to 16 MB of RAM and 2.5 GB of mass storage. RS-232 communications can grow from 2 to 42 ports. A powerful Motorola 68000 RS-232 accelerator is available to enhance total system throughput. Up to 32 Convergent PT and GT intelligent terminals can be connected through four high-speed RS-422 ports. Extensive communication facilities support both local- and wide-area networks.





The MightyFrame incorporates the UNIX System V Release 2.2 operating system, with virtual memory and record locking. In addition to Convergent's own extensive software offerings, hundreds of UNIX-compatible programs are available.

#### **MIGHTYFRAME HARDWARE OVERVIEW**

The main MightyFrame cabinet contains:

- The Main Processor Board
- Memory and I/O Subsystems
- 1/4-inch Streaming Tape Drive
- One to three 5 1/4-inch Winchester Disk Drives
- Power Supply
- One to four Memory Expansion Boards
- One to five optional Communication Expansion Boards
- Optional 4-slot VME Bus Assembly

#### **Main Processor**

The Main Processor Board is based on the Motorola 68020 microprocessor with on-chip cache, operating at 12.5 MHz, and has 1 MB of RAM. A discrete Memory Management Unit supports demand paging with 32 Mbytes of virtual address space. Included on the Main Processor Board is one Centronics-compatible parallel port, and 2 RS-232 ports supporting both synchronous and asynchronous protocols at 9600 bps. A time-of-day clock with battery back-up is provided, as is a connector for attaching an intelligent Uninterruptible Power Supply (UPS).

#### **Memory**

The MightyFrame includes 1 MB of byte-parity protected RAM, which can be expanded via the four-slot, 32-bit data-path memory bus located in the front of the cabinet. Memory expansion boards in 2 MB and 4 MB increments can be easily installed, upgrading the addressable memory to a maximum of 16 MB.

#### **I/O**

Easily accessible from the back of the MightyFrame is the five-slot Local I/O Bus for communication expansion. Four slots are dedicated to RS-232 Communication Expansion boards; the Local I/O Bus will support up to 40 RS-232 ports.

*RS-232 Communications Expansion* boards are available with either 10 or 20 ports. They support standard ASCII terminals and serial printers, at speeds of up to 9600 bps.

The remaining Local I/O Bus slot has a priority DMA channel for one of two expansion options: an RS-422 Communications Expansion board, or an RS-232 Accelerator board.

The *RS-422 Communications Expansion* board consists of four RS-422 ports which support up to 32 RS-422 devices, such as Convergent PT and GT intelligent terminals, configurable to 307,000 bps or 2.0 million bps. In addition, the board contains one Centronics parallel port, supported at speeds up to 600 lines per minute.



The *RS-232 Accelerator* board, using a Motorola 68000 microprocessor running at 12.5 MHz, provides high performance processing of terminal interrupts. This off-loads the main CPU by as much as 25%, allowing it to dedicate its processing power to the application. This board also contains one Centronics parallel port, supported at speeds up to 600 lines per minute.

### Mass Storage

The base MightyFrame unit contains one 50 MB or 85 MB 5¼-inch Winchester drive, and one 65 MB ¼-inch streaming tape unit, helpful in system back-up. Systems can be upgraded to contain up to three 50 MB or 85 MB 5¼-inch Winchester drives, for a maximum of 255 MB of internal mass storage. Additional mass storage is available when using MightyFrame in combination with the optional Expansion Cabinets.

### VME

Internal to the MightyFrame, a *VME Bus Assembly* with four VME slots can be added. The VME bus provides an industry standard VME interface to the MightyFrame system, including 32-bit transfers at up to 49 MB/second across the VME bus. Both single and double Eurocard standard sizes are supported.

### MIGHTYFRAME EXPANSION CABINETS

The MightyFrame supports up to two Expansion Cabinets.

#### VME Expansion

For additional VME Expansion, the MightyFrame system provides a *VME Expansion Cabinet*. Latching easily to the side of the MightyFrame, the VME Expansion Cabinet provides 10 additional VME ports, and can house up to two 300 MB 8-inch Winchester SMD drives.

MightyFrame supports *one* VME Expansion Cabinet, connected to the VME Bus Assembly inside the MightyFrame.

#### SMD Expansion

For further mass storage expansion, up to two *SMD Expansion Cabinets* can be latched to the MightyFrame system. Each of these cabinets can house one to four 300 MB 8-inch Winchester SMD drives. As with drives residing in the VME Expansion cabinet, SMD drives are supported by adding SMD Controller boards to any of the VME bus slots. Each board controls two SMD drives. Two fully-loaded SMD Expansion Cabinets, supported by the internal VME Bus Assembly, provide mass storage of over 2.5 GigaBytes. To aid in system back-up, a 1/2-inch tape controller can be added on the VME bus.

## SOFTWARE

### Operating System Support

The CTIX™ Operating System, derived from and compatible with UNIX System V Release 2.2, is a time-shared operating system for the Convergent family of 68000-based products. CTIX provides both the

Bourne and C shells, extensive programming tools, a multi-window, multi-application window manager, and Berkeley enhancements.

Other enhancements include:

- Dynamically loadable drivers
- Robust UNIX file system
  - requires no check after sane shutdown
  - provides recovery in the case of single bit errors
- Database support in the file system including clustered files
- Pre-emptive scheduling

On the MightyFrame, CTIX supports a 32 MB virtual address space: 8 MB are reserved for kernel virtual space, and 24 MB are available for each running process. CTIX includes a VME bus driver allowing access to VME bus peripherals, and a network interface supporting access to remote file systems and remote process execution.

### Languages

- C Compiler
- COBOL Compiler
- FORTRAN Compiler
- Pascal Compiler
- BASIC Interpreter
- BASIC Compiler

### Data Management Facilities

- ISAM
- Sort/Merge
- Forms Generator

### Communications Services

- 2780/3780
- BSC 3270
- SNA 3270
- X.25 User Interface
- Ethernet TCP/IP

### The MightyFrame Office Applications

- Word Processor
- Financial Spreadsheet
- GKS Graphics Libraries

### Third Party Software

Convergent works closely with software developers to ensure that an extensive set of applications is available to users of Convergent equipment. Software developed to AT&T's System V Interface Definition will run without modification on MightyFrame and the other members of the Convergent UNIX family.

**SPECIFICATIONS****Processor**

MC 68020 at 12.5 MHz  
MC 68881 floating point co-processor (optional)  
MC 68000 at 12.5 MHz (optional)

**Memory Capacity**

RAM: 1-16 MB

**Serial I/O Rates**

External Clock  
RS-232-C: 110 bps to 38,400 bps  
Internal Clock  
RS-232-C: 50 bps to 38,400 bps  
RS-422: 307,000 bps or 2.0 million bps

**Parallel I/O Rate (Printer Interface)**

600 lpm

**Ethernet**

Conforms to IEEE 802.3 specifications

**Electrical**

115 V: 85-130 Vrms, 12 Amps at  
47 Hz to 63 Hz  
230 V: 180-260 Vrms, 6 Amps at  
47 Hz to 63 Hz

The AC loads specified above represent the loads presented to the line by a fully configured system.

**PHYSICAL**

Height: 29 in. (73.66 cm)  
Width: 11 in. (29.21 cm)  
Depth: 26 in. (66.04 cm)  
Weight: 110 lbs. (50 kg) Fully loaded system

**ENVIRONMENTAL AND SAFETY****Safety**

Meets UL 478 (EDP) and 114 (Office Equipment)  
Meets CSA 154 (EDP) and 143 (Office Equipment)  
Meets VDE 0806/8.81 (Office Equipment)  
Meets IEC 380 (Office Equipment)

**Emissions**

Meets VDE 0871 /6.78, Class A  
Meets FCC Part 15, Sub-part J, Class A

**ESD**

5,000 Volts: No observable effect  
15,000 Volts: No operator perceived errors  
25,000 Volts: No permanent damage

**Altitude**

Operating: 10,000 feet ASL  
Non-Operating: 30,000 feet ASL

**Acoustic Noise Level**

55 dBA max.

**Temperature**

Operating: 10°C to 40°C  
Non-Operating: -40°C to 60°C

**Relative Humidity**

Operating: 10% to 80% RH, non-condensing  
Non-Operating: 10% to 90% RH, non-condensing

**Shock**

Operating: 5 g  
Non-Operating: 15 g

**Transportation**

Packaging and shipping containers and procedures comply with the current NSTA preship test procedures.

**Shipping Container**

40 in. (h) x 36.5 in. (l) x 24 in. (w)

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