Convergent

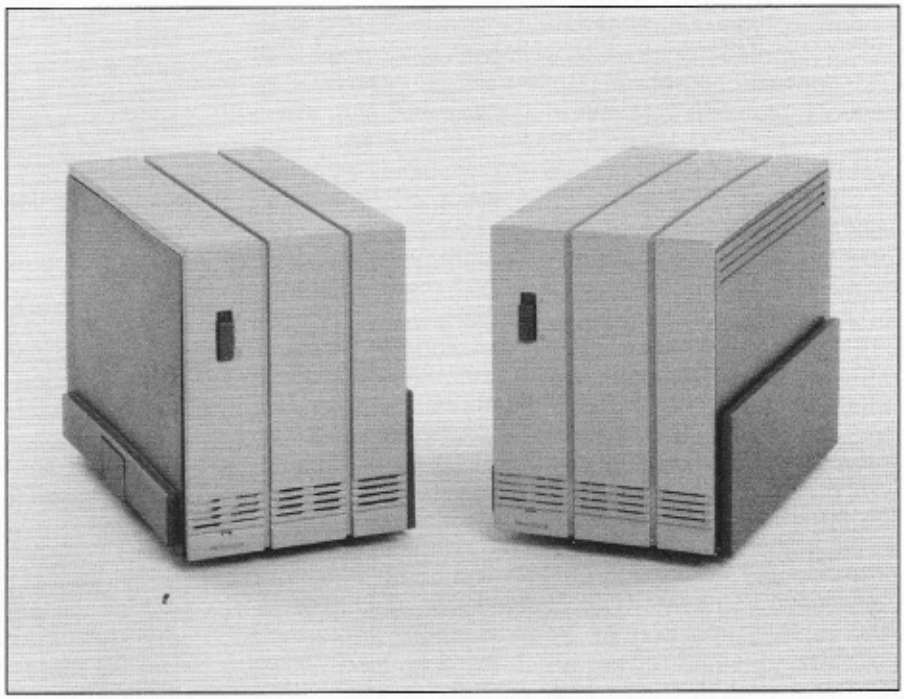
NGEN Series 286

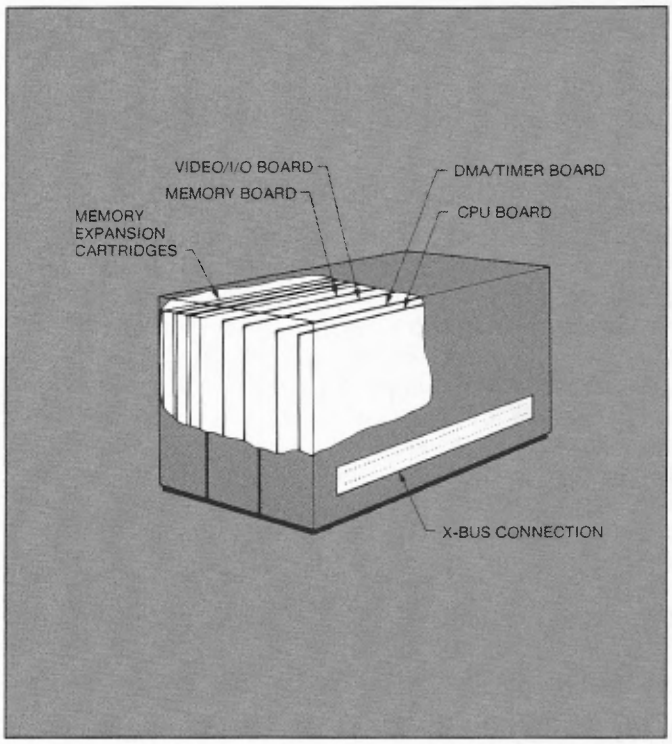
- **Four models:**
  - **CP-002: 8-MHz 80286 CPU**
  - **CP-002/287: 8-MHz 80286 CPU with 80287 math coprocessor**
  - **CP-0A2: 8-MHz 80286 CPU with enhanced video**
  - **CP-0A2/287: 8-MHz 80286 CPU with 80287 math coprocessor and enhanced video**
- **Twice the data throughput as 186-based systems for faster transactions**
- **RAM expansion up to 4 MB**
- **80287 floating-point operations up to 20 times faster than 80286-only hardware**
- **Peer-to-peer networking support through state-of-the-art LANs and TeleCluster**
- **Supports up to 12 additional workstations**
- **Supports full range of office automation applications**
- **MS-DOS runs in virtual-8086 mode for compatibility with installed applications**
- **Modular design extends capabilities, protects investment, and accepts NGEN X-Bus and SCSI expansion**
- **I/O includes RS-232-C, RS-422, RS-485, and parallel port**
- **Enhanced video supports 132-column and bidirectional port for financial, scientific, and office automation applications**
- **User friendly with easy installation, upgrades, and on-screen diagnostics**

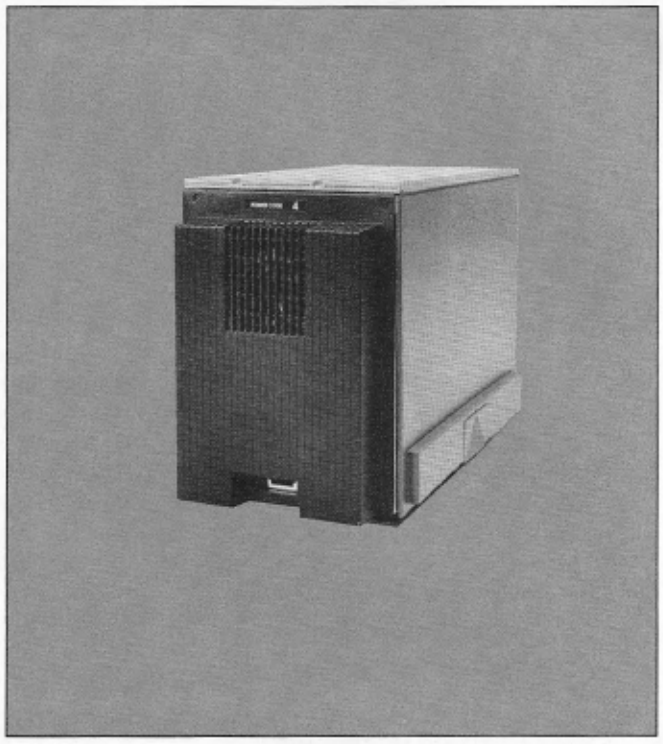
The Convergent™ NGEN® Series 286™ processor module provides the core of the expandable NGEN workstation. It includes an Intel® 80286 microprocessor and supporting logic, the system RAM, input/output (I/O) devices for external communications, and logic to drive the video display and keyboard. The modularity of the Series 286 allows easy upgradability and expanded capability. Users can add the latest technology processor without the need to replace peripheral NGEN modules. The Series 286 processor module maintains compatibility with all of Convergent's office automation application programs, operating systems, and vast array of X-Bus™ modules and Small Computer System Interface (SCSI) peripherals ('HSD' upgrade modules). Whether used as a new workstation or as an upgrade, the Series 286 adds full-featured 80286 microprocessor performance and functionality.

In addition to supporting the vast array of CTOS™ applications, the Series 286, with CTOS/VM™ and the PC Emulator Module (PC-001), simultaneously supports CTOS and MS-DOS® operating systems and applications.

The Series 286 processor module includes an Intel 8-MHz 80286 microprocessor and supporting logic. The system's RAM, I/O control devices for external communications, and logic to drive the video display and keyboard are also housed within this 5.75-inch wide module.







Each processor module contains four standard printed circuit assemblies and has room to accommodate three optional RAM expansion cartridges, providing up to a maximum of 4 MB of system memory. Input/output support includes two RS-232-C ports, an RS-422 (RS-485 on CP-0A2) cluster communications channel, and a Centronics-compatible parallel printer port for network operations at 1.84 million bits/sec.

Four models of the Series 286 are available. All share the same functional characteristics, but vary in computational performance for floating-point operations. The CP-002/287 and CP-0A2/287 use both an Intel 8-MHz 80286 microprocessor and an 80287 math coprocessor to perform floating-point operations and provide enhanced performance in computationally intensive applications. All of these processor modules operate at more than twice the speed of 80186-based processor modules. Models CP-0A2 and CP-0A2/287 include enhanced video for added efficiency and productivity.

The 80286 microprocessor used in the Series 286 includes many features that enhance overall system performance and software flexibility. The on-chip Memory Management Unit (MMU) is designed for off-chip code/data caching and permits 24-bit memory addressing and data transfers. The larger memory also allows more programs to concurrently reside in memory. The 80286 also overlaps instruction decoding with execution, thus increasing its performance compared to other microprocessors operating at the same clock rate.

MEMORY MANAGEMENT

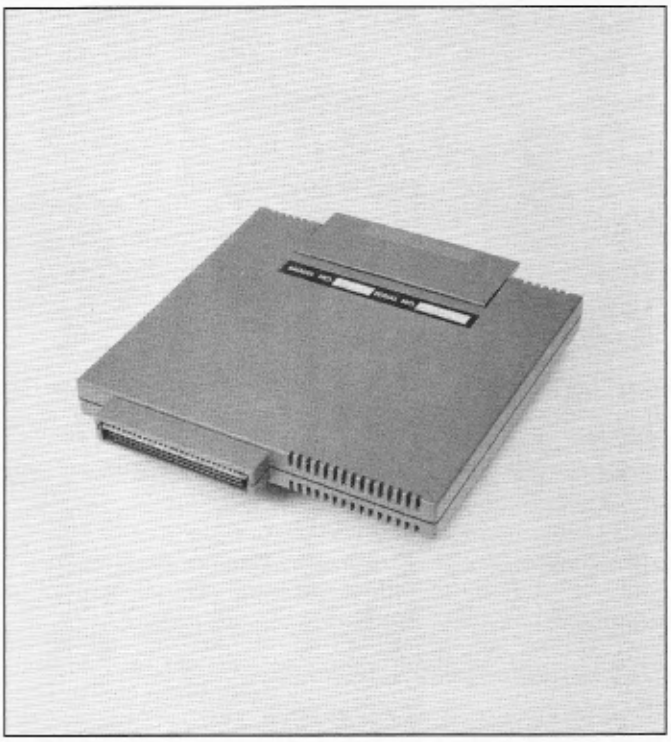
The 80286 MMU plays a crucial role in the chip's high-performance, virtual-memory, multitasking capabilities. Memory management, which performs address translation, is a necessary part of all memory accesses. And since microprocessors must reach main memory thousands or millions of times every second, this translates into a substantial boost in overall performance.

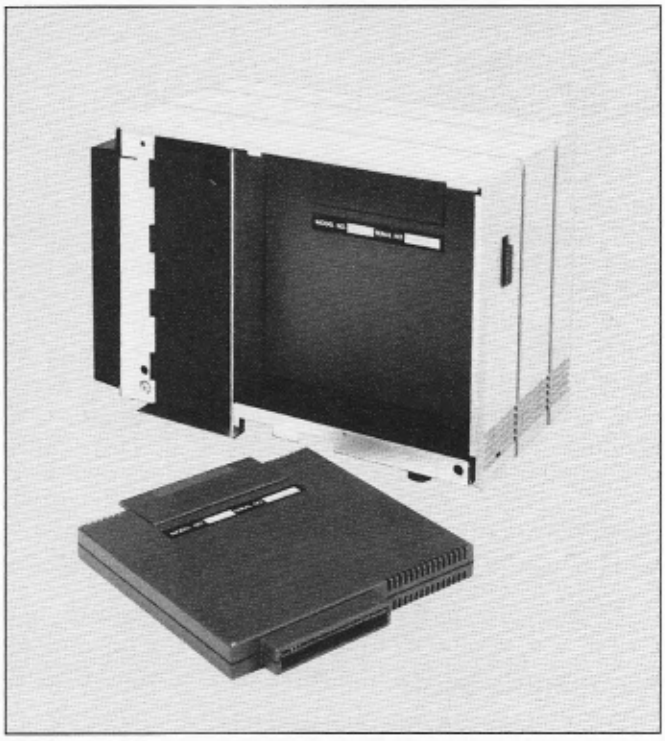
The basic unit contains 1 MB of RAM storage with byte parity error detection and logic to control and refresh all system memory, including optional RAM expansion cartridges in either 512 KB or 1024 KB configurations.

VIDEO MANAGEMENT

The video circuitry contains a Motorola® 6845 character-mapped video controller, which drives the display of 29 lines of 80 characters. The standard character set (256 characters) contains the entire print ASCII character set, graphics characters, common symbols, and selected foreign alphabetic characters.

The character matrix is stored in a high-speed RAM array, known as *font RAM*, which contains 4096 10-bit entries. The character set may be easily changed under software control by loading another character set into the font RAM. This feature provides unlimited flexibility in displayable character sets. The video hardware allows characters to be displayed with up to six attributes: underline, blink, reverse video, bold, half-bright, and struckthrough.





ENHANCED VIDEO

The CP-0A2 and CP-0A2/287 provide enhanced video (EV) capabilities. In addition to the standard video features supported by the Series 286, EV supports monochrome, color character, 34 lines of 132 characters, and 64-color palette (8-color foreground and 8-color background). The Centronics-compatible bidirectional parallel port allows for the integration of additional peripherals and office automation applications such as image scanning.

HARDWARE

The Series 286 processor module supports most NGEN X-Bus and SCSI peripheral modules, which are designed for high-performance and multitasking capabilities. The X-Bus connector and latch mechanism are located on the right side panel of the processor module to allow for easy installation of the NGEN and SCSI expansion modules.

All external cables enter the processor module through a small opening and easily attach to connectors inside the module. The left side panel of the module easily detaches, providing access to these connectors. The unit, therefore, has a finished appearance on all sides with no visible cable connectors.

The Series 286 processor module packaging continues to lead the industry for system modularity. The CPU, video logic, and base memory are contained in an internal compartment, not visible to end users. A low-speed fan draws air into the bottom front of the module and blows it out of the top-rear of the module. The NGEN provides the utmost in end-user configurability, while maintaining a streamline appearance, unmatched by any other workstation design.

VISINOSTICS

All Series 286 modules can be installed by end users using no special tools or equipment. With the Visinostics package, operators can troubleshoot system and component level problems using their own workstation.

Visinostics provides a graphic representation of the NGEN configuration on the system display and allows the user to visually select which elements are to be tested. It then runs the selected test programs and highlights any components that do not run their diagnostics properly.

SPECIFICATIONS

POWER CODES

Module	Power Code
CP-002	4
CP-002/287	4
CP-0A2	4
CP-0A2/287	4
XM-002	0
XM-003	0.25

STORAGE CAPACITIES

Module	Base RAM (KB)	Max RAM (KB)	ROM (KB)
CP-002	1024	4096	8
CP-002/287	1024	4096	8
CP-0A2	1024	4096	8
CP-0A2/287	1024	4096	8
XM-002	512		
XM-003	1024		

MICROPROCESSOR

CP-002	80286 running at 8 MHz
CP-002/287	80286 running at 8 MHz and 80287
CP-0A2	80286 running at 8 MHz
CP-0A2/287	80286 running at 8 MHz and 80287

RS-232-C CLOCK RATE

External:	110 to 19,200 bps
Internal:	50 to 19,200 bps

RS-422/RS-485 CLOCK RATE

Internal:	100 bps to 1.84 Mbps

PARALLEL I/O RATE

Typical:	9600 char/sec
Bidirectional:	9600 char/sec (CP-0A2)

PHYSICAL

Height:	8 in. (203.2 mm)
Width:	5.75 in. (146.1 mm)
Length:	12 in. (304.8 mm)
Weight:	10 lb (4.54 kg)

REGULATORY

Safety

Meets UL 478, Fifth Edition (EDP) and 114 (Office Equipment)
Meets CSA 154 (EDP)
Meets VDE 0806 (Office Equipment)
Meets IEC 380 (Office Equipment)

Emissions

Meets VDE 0871, Level A
Meets FCC Part 15, Subpart J, Class A

ENVIRONMENTAL

ESD

2,500/5,000V:	Software errors allowed at 4% rate
12,500V:	Errors corrected via software intervention
17,500V:	Errors corrected via operator intervention
25,000V:	No permanent damage

Temperature/Relative Humidity

Operating:	13°C to 35°C 10% to 80%
Non-operating:	-40°C to 65°C 95% at 41°C for 8 hr

Altitude (above sea level)

Operating:	7,000 ft
Non-operating:	40,000 ft

Shock

Operating:	5 g, X/Y/Z axes (10 g, Z axis only)
Non-operating:	20 g, X/Y/Z axes

Vibration

Operating:	0.35 g, 20 to 500 Hz, X/Y/Z axes
Non-operating:	0.75 g, 5 to 500 Hz, X/Y/Z axes

Acoustic Noise Level

60 dB(A)

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