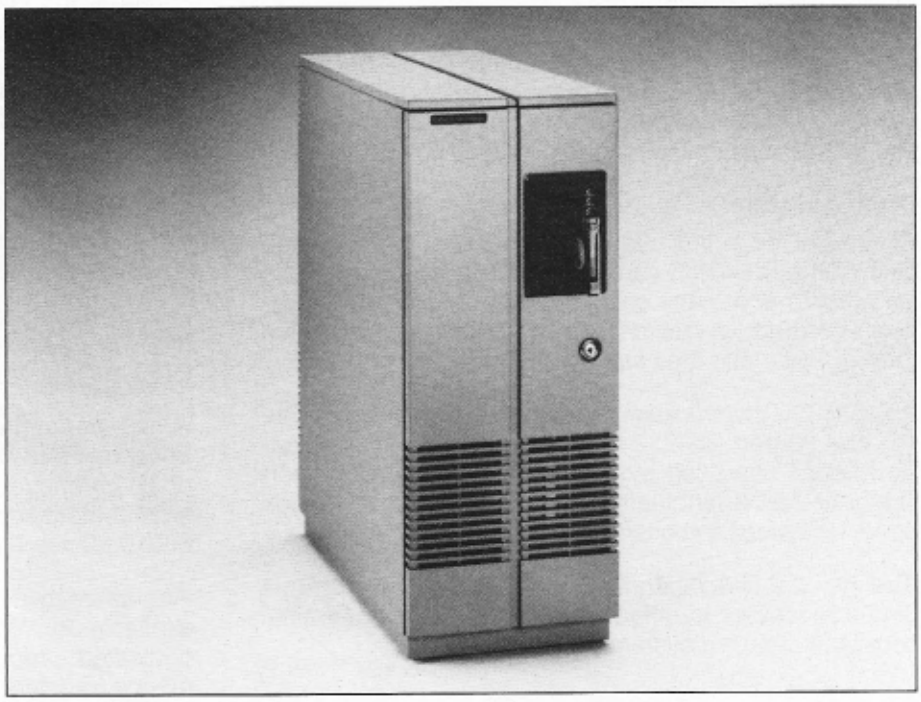
Convergent

S/640 Overview

- **Powerful 32-bit minicomputer supporting up to 64 users**
- **Industry-standard UNIX Systems V operating system with 1 GB demand-paged virtual memory**
- **Motorola 68020 microprocessor operating at 25 MHz with 128 KB cache**
- **MC 68881 floating-point coprocessor at 20 MHz**
- **Optional 4- or 14-slot VME bus**
- **Up to 32 MB ECC RAM in 4 or 8 MB increments**
- **Internal SCSI bus adapter**
- **Up to three integral 5 1/4-inch 85 or 190 MB hard disk drives**
- **Optional SMD or ESMD storage from 350 MB to 10 GB**
- **Supports multiple IEEE 802.3-compatible Ethernet boards**
- **High-speed communications controller option**
- **Object-code compatibility across the S/Series**
- **Easy-to-use administrative and diagnostic tools**
- **Full range of software including:**
  - **-Languages and development tools**
  - **-Data management facilities**
  - **-Communications and networking**
  - **-Office applications**

The S/640™, a member of the Convergent™ S/Series™ family of WorkGroup Servers™, is a high-performance, 32-bit minicomputer based on the Motorola® 68020 microprocessor and the UNIX® System V operating system. With computing power of over 4 million instructions per second (MIPS), the S/640 concurrently supports up to 64 active users. The system has the processing power to support sophisticated office automation and data processing tasks. It also makes a powerful network or database server. With the addition of readily available UNIX-based software and hardware options, the S/640 is well suited for laboratory, factory, and design automation tasks. Combining industry-standard components and interfaces with a high-performance architecture and an easy-to-use design, the S/640 makes mainframe performance accessible to a broader marketplace.

The S/640 is designed with built-in high reliability and data protection features. The physical design allows replacement of subassemblies in a matter of minutes. Extensive diagnostic tools complement the hardware design and include a remote diagnostics capability. In addition, CTIX™ – the UNIX System V-based operating system for the S/Series – has been enhanced to ensure file and data reliability even in the event of a complete power loss. An uninterruptible power supply (UPS) can be attached to the UPS port, which is a standard feature of the S/640. The combination of a reliable design, high-quality manufacturing, fast serviceability, and software protection provides high reliability and low life-cycle costs.



S/640 HARDWARE OVERVIEW

The S/640 is a highly configurable system. The main S/640 cabinet contains:

- Main processor board
- Memory and I/O subsystems
- One to four memory expansion boards
- One to five optional I/O expansion boards
- Backup/distribution device
- One to three 5 1/4-inch Winchester drives
- Optional four-slot VME bus assembly

Main Processor

The main processor board is based on the Motorola 68020 microprocessor operating at 25 MHz and uses a 128 KB physical cache with writeback. A proprietary memory-management unit supports demand paging with a 1 GB virtual address space for each process. The main processor board includes two RS-232-C ports (supporting both synchronous and asynchronous protocols at 19.2 thousand bits/sec), a bidirectional Centronics-compatible parallel port, and a port for attaching a UPS. A time-of-day clock with battery backup is also provided.

In addition to the system bus, the main processor board supports the single-ended Small Computer Systems Interface (SCSI) bus that is fully compatible with the ANSI X3T9.2 standard. The SCSI bus on the main processor board supports both synchronous and asynchronous devices inside the main cabinet.

Memory Subsystem

The S/640 supports up to 32 MB of error-correcting code (ECC) protected RAM via the 64-bit data-path memory bus located in the front right-hand side of the cabinet. Memory expansion boards are available in 4 and 8 MB increments; up to four boards can be added.

I/O Subsystem

A five-slot local I/O bus is easily accessible from the back of the S/640. A variety of I/O boards are available as options, and many configurations are possible. Unless specified, all boards use the first four slots of the local I/O bus, and they can be intermixed.

RS-232-C Communications Expansion boards include 10- and 20-port RS-232-C boards. (The 20-port expansion board uses two system slots.) All ports support standard ASCII terminals and serial devices at speeds up to 19.2 thousand bits/sec.

The *RS-232-C Accelerator board* uses its own Motorola 68000 processor to offload the main CPU from terminal activity, increasing system throughput. It is used in conjunction with the 10- and 20-port expansion boards. One RS-232-C Accelerator board can be configured in the S/640 and occupies the fifth local I/O slot.

An *RS-422 Communications Expansion board* consists of four RS-422 ports and supports up to 32 Convergent intelligent terminals at 307 thousand bits/sec. In addition, each port can support communications at 1.8 million bits/sec. The board also contains a Centronics-compatible parallel port, supported at speeds up to 1200 lines per minute (lpm). This board uses the fifth slot of the local I/O bus.

The *Ethernet Controller board* supports IEEE 802.3-compatible connections with a 64 KB buffer and dedicated high-performance processor. The board also has six RS-232-C ports. Up to four Ethernet boards can be configured on the local I/O bus.

Mass Storage Subsystem

The S/640 supports a total of four 5 1/4-inch mass storage devices. Standard configurations consist of a 1/4-inch streaming tape unit and one to three Winchester disk drives. Drive options available provide 85 MB and 190 MB of internal storage. Additional data storage options are available using the VME option boards and optional expansion cabinets.

VME Subsystem

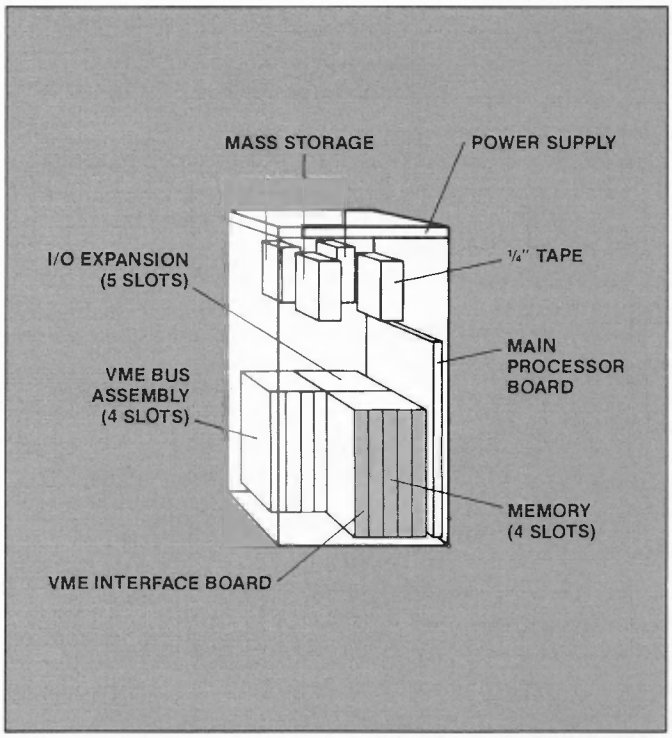
A VME bus assembly with four VME slots can be added at the lower left back of the main cabinet. The VME bus provides an industry-standard VME interface to the S/640. Both single and double Eurocard standard sizes are supported. In addition to third-party offerings, several Convergent VME boards are available

The VME-based *SMD Controller* supports up to two SMD drives (each at transfer speeds up to 3 MB/sec) and provides 32-bit ECC. The system concurrently supports multiple SMD controllers.

A VME-based *Half-Inch Tape Controller* supports up to four Pertec-compatible drives with ranges from 800 to 6250 bpi and from 12.5 to 200 ips.

A high-performance VME-based *Communications Controller* has four DMA-supported RS-232-C ports capable of synchronous and asynchronous communications up to 19.2 thousand bits/sec, and includes a dedicated MC 68010 microprocessor with 512 KB of local memory.

An alternative *Ethernet Communications board* is available for VME configurations. The board has a dedicated processor and DMA logic for high-performance transfers.



S/640 EXPANSION CABINETS

The S/640 supports up to four expansion cabinets.

VME Expansion

The S/640 contains a VME expansion cabinet for additional VME expansion. Latching easily to the side of the S/640, the VME expansion cabinet provides 10 additional VME slots and can house up to two 350 MB SMD or 750 MB ESMD 8-inch Winchester drives. The S/640 supports one VME expansion cabinet, connected to the VME bus assembly inside the S/640.

SMD Expansion

For further mass storage expansion, up to three SMD expansion cabinets can be connected to the S/640 system. Each cabinet can house one to four 350 MB SMD or 750 MB ESMD 8-inch Winchester drives. As with drives residing in the VME expansion cabinet, SMD drives are supported by the addition of SMD Controller boards to any of the VME bus slots. Three fully loaded SMD expansion cabinets, combined with a VME expansion cabinet, provide mass storage of over 10 GB.

SOFTWARE

Operating System Support

The CTIX operating system, derived from and compatible with the UNIX System V operating system, is a time-shared operating system for the S/Series family of WorkGroup Servers. CTIX provides both the Bourne and the C shells, extensive programming tools, a multiwindow application window manager, and Berkeley enhancements.

Other enhancements include:

- Dynamically loadable drivers
- Robust UNIX file system (requires no check after normal shutdown and provides recovery in case of single-bit errors)
- Database support in the file system, including direct I/O and contiguous blocks
- Realtime enhancements, including preemptive scheduling and asynchronous I/O

On the S/640, CTIX supports a 1 GB virtual address space per process; 16 MB are reserved for kernel virtual space, and the balance is available for each running process. A device driver manual is available to help create and integrate customer-generated device drivers.

Languages

- C
- LPI COBOL
- RM COBOL-85
- FORTRAN
- Pascal
- BASIC Interpreter
- BASIC Compiler
- ACCELL™/E program development language

Data Management Facilities

- ISAM
- UNIFY®/E relational database
- Sort/Merge
- Forms Package
- CTAM™ windows

Communications Services

- BSC 2780/3780
- BSC 3270
- SNA Network Gateway
- SNA 3270
- SNA RJE
- LU6.2/PU2.1
- X.25 Network Gateway
- Ethernet TCP/IP
- TCP/IP over X.25
- Multiplex™ PC network productivity tool
- PC Exchange™/VINES™

Office Automation Software

- WGS/OFFICE™, including:
  - WGS/DESKTOP™
  - WGS/WordProcessor™
  - WGS/SpreadSheet™
  - WGS/Mail™
  - WGS/Calendar™
  - WGS/WORD ERA™

Third-Party Software

Convergent works closely with software developers to ensure that an extensive set of applications in the UNIX environment is available to users of Convergent equipment. Software developed to the AT&T System V Interface Definition (SVID) will run on the S/640 and other Convergent S/Series products.

SPECIFICATIONS

Processor

MC 68020 at 25 MHz
MC 68881 floating-point coprocessor at 20 MHz
Physical cache of 128 KB

Memory Capacity

RAM: 4 to 32 MB

I/O RATES

RS-232-C

External: 110 bps to 38.4 kbps
Internal: 50 bps to 38.4 kbps

RS-422

Internal: 307 kbps or 1.8 Mbps

Parallel (Printer Interface)

1200 lpm

SCSI Data

Async: Up to 1.5 MB/sec
Sync: Up to 4.0 MB/sec

Ethernet

Conforms to IEEE 802.3 specifications

ELECTRICAL

115V: 85 to 130 Vrms
10.6A at 47 to 63 Hz
230V: 180 to 260 Vrms
5.3A at 47 to 63 Hz

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

PHYSICAL

Height: 29 in. (73.7 cm)
Width: 11 in. (29.2 cm)
Depth: 26 in. (66.0 cm)
Weight: 140 lb (64 kg) fully loaded

REGULATORY

Safety

Meets UL 478 (Business 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, Subpart J, Class A

ENVIRONMENTAL

ESD

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

Ambient Temperature/Relative Humidity

Operating: 10°C to 40°C
20% to 80%, noncondensing
Non-operating: -40°C to 60°C
10% to 90%, noncondensing

Altitude

Operating: 10,000 ft ASL
Non-operating: 30,000 ft ASL

Shock

Non-operating: 10 g

Acoustic Noise Level

55 dB(A) max

Transportation

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

Convergent Technologies, Inc.
2700 North First St., San Jose CA 95150-6685
(408) 434-2848

Convergent House, Ellesfield Ave., Southern Industrial Area
Bracknell, Berkshire, England RG12 4WB
44-344-411-707

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