ALTOS

386
SERIES 1000

RESET

RUN

The ALTOS 386 Series 1000 Multi-User Systems

The Altos 386 Series 1000 Multi-User System: A computer system that combines the features and benefits found in larger systems in a package that's economical enough for the smaller installation.

It's a fast, powerful, and efficient system with features you'd expect to see only on larger and more expensive systems. Like Intel 80386 processor technology operating at 16 or 25 MHz. 32 KB cache memory. An intelligent input/output controller that enhances performance by supporting communications protocols and peripheral devices. And an optional floating point co-processor for fast math-oriented operations.
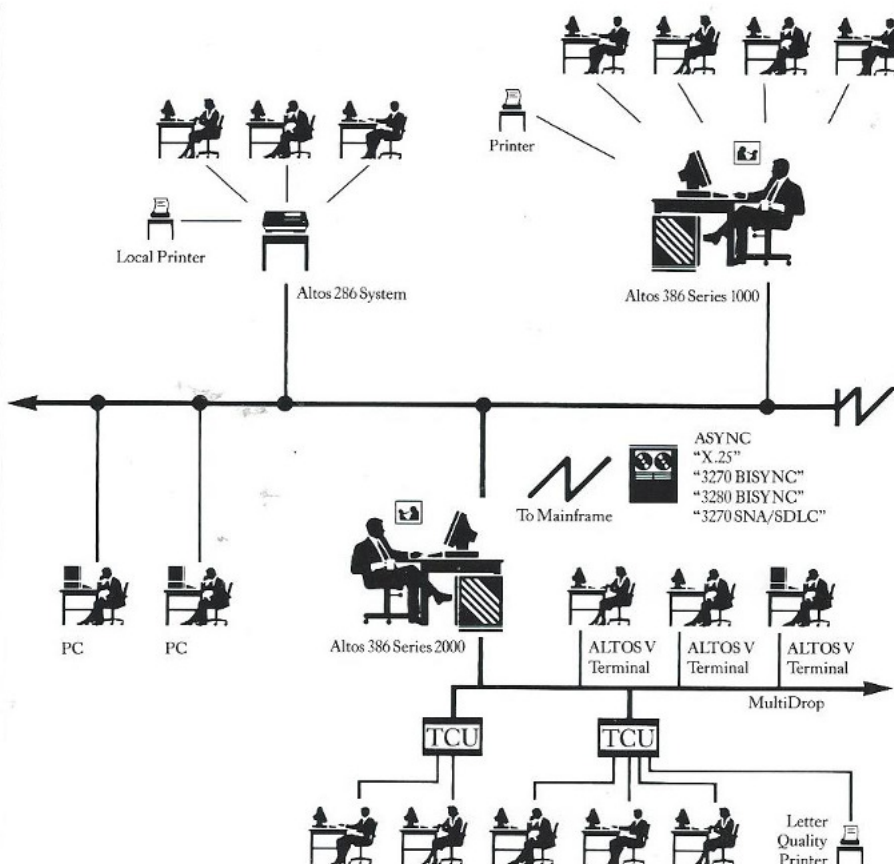
It's a flexible system that can grow to support 24 users. But it was built to address any business need because data storage, communications systems and memory expansion boards are all modular and can be installed at any time.

It's the best of both worlds—the speed and power of a large system, in a package suited to the needs of the smaller business or department.

Features

- High-performance multi-user system supporting up to 24 users
- Powerful Intel 80386 microprocessor operating at 16 or 25 MHz with zero wait states
- 32 KB direct mapped cache memory
- Optional 16 or 25 MHz Intel 80387 floating point co-processor
- Intel 80186 I/O and Device Controller with 128 KB RAM
- 2 to 16 MB of System RAM
- 40 to 300 MB of internal mass storage available with either one or two half-height SCSI disk drives or one full-height SCSI disk drive
- Integral 1.2 MB floppy disk drive
- Support for 125/150 MB SCSI ¼-inch streaming tape drive
- 8 RS232 ports; expandable to 24 RS232 ports
- Industry standard UNIX® System V Release 3.1 with XENIX® compatibility
- Support for Altos AdLANtes™ and Asynchronous Communications
- Extensive base of Altos-supported applications software, including office automation, database management, accounting and business graphics
- Industry standard languages including C, Basic, Pascal, COBOL, FORTRAN, and others

Local Printer
Altos 286 System
Printer
Altos 386 Series 1000
PC
PC
Altos 386 Series 2000
To Mainframe
ASYNC
"X.25"
"3270 BISYNC"
"3280 BISYNC"
"3270 SNA/SDLC"
ALTOS V Terminal
ALTOS V Terminal
ALTOS V Terminal
MultiDrop
TCU
TCU
Letter Quality Printer

Architecture

The Series 1000 combines the advantages of a single board computer for lower entry-level cost, and modular design for expandability and growth. The main logic board includes communication ports and space for memory. In addition, the system provides three expansion memory slots, space for up to 4 half height storage device modules, and support for two additional I/O slots.

System hardware is designed so that a basic system can function with only the main logic board. Expansion memory boards may be plugged directly into the main logic board. Communications expansion beyond the basic configuration requires plugging boards into slots on the main logic board with the use of an AXB adapter.

Data storage is provided by up to four modular storage devices—two removable and two fixed. The removable media consist of one 5.25-inch floppy disk drive and one 5.25-inch SCSI cartridge tape drive. Fixed media consist of either one or two half-height 5.25-inch SCSI disk drives.

The Main Logic Subsystem

The Altos 386 Series 1000 is designed around Intel's most powerful microprocessor—the 80386. This full 32-bit CPU operates at 16 or 25 MHz with zero wait states when operating out of its large 32 KB data and instruction cache memory.

Cache Memory

A feature not normally found in this category of computer, efficiently uses the full power and speed of the microprocessor by keeping its own copy of data and instructions the processor is most likely to use repeatedly. Since cache memory is much faster and smaller than the main memory, the CPU can access data and operate much more efficiently.

Memory Management Unit

Designed on the 80386 CPU for high performance in a mutli-user, multi-tasking environment, the unit supports Altos' full demand-paged Virtual Memory with 2 GB of user virtual address space in easily managed 4 KB pages. The main logic board contains an interrupt controller, a calendar clock with battery backup and support for a 16 or 25 MHz Intel 80387 floating point numeric processor for fast math-oriented operations.

Memory

Single board design allows the main logic board to provide support for system memory.

Entry-level configurations with 2 MB of memory will include the main logic board with zero memory and a 2 MB memory board. This leaves two memory expansion slots for additional memory.

System configurations with at least 4 MB of RAM will have the first 4 MB of RAM located on the main processor subsystem. This allows the system to support more memory by reserving all three memory slots for expansion RAM.

The CPU communicates with all system memory via a 32-bit data bus.

I/O Controller Bus

The I/O controller bus is asynchronous and has 16 data lines and 25 address lines that can support a maximum data transfer rate of 5.8 MB per second. Data transfers may

be either 8 or 16 bits wide. The I/O controller bus also supports four bus masters, and all processors in the system communicate with each other via system memory and I/O channel attentions and interrupts.

Communications

To off-load the CPU from directly supporting terminal I/O, a 7.3 MHz 80186 I/O controller with 128 KB of memory is designed to support the 8 serial RS232 ports resident on the main processor subsystem and up to 16 additional RS232 ports on expansion boards. One of the eight on-board ports may be software configurable as an Altos WorkNet LAN port.

Peripherals Control

The 80186 I/O controller, assisted by an 82258 four-channel ADMA controller, efficiently manages the I/O peripheral devices. Internally, a floppy disk drive, a SCSI tape drive and up to two SCSI disk drives are supported. Additional peripherals can be added via an optional external SCSI port with user-developed software drivers.

System Memory

Main memory is closely coupled so that all system memory operates at high speed, providing a data transfer up to 18.3 MB per second. System memory is organized into long words of 32-bits, and memory transfers can be made in 8-, 16-, 24-, or 32-bit quantities.

Memory capacity in the Series 1000 is greater than virtually any other system in this category of computer. Four MB of RAM can

be supported directly on the main logic board. Up to three additional memory slots are available within the system for system memory. Memory expansion is available with 2 MB, 4 MB, and 8 MB boards.

The Series 1000 will support up to 16 MB. Entry-level configurations can start with a 2 MB RAM board with no RAM on the main logic board and expand to 16 MB with an additional 4 MB and 8 MB board.

Communications

The main logic board supports communications through 8 RS232 ports, including one port that is software configurable to support the Altos WorkNet LAN, a network capable of connecting up to 30 Altos systems. An AXB adapter may also be added to the Series 1000 that supports two I/O communications expansion slots.

Up to 16 serial RS232 ports may be added to the 8 ports on the main logic board via two 8-port serial RS232 expansion boards connected to the AXB adapter for a system total of 24 ports.

The Altos Advanced Communications Processor Attachment (ACPA) is an intelligent communications subsystem that combines the functions and capabilities of three communications subsystems in a single board design. The ACPA provides: The Wide Area Networking (WAN) capabilities of the Serial I/O subsystem; the enhanced terminal connectivity of the Multidrop subsystem; and the industry standard Local Area Networking (LAN) features of Ethernet.™ In addition to these capabilities, the ACPA may be used to provide any or all of the above mentioned functions simultaneously. As with all previous Altos

communications subsystems, the ACPA has its own on-board microprocessor and local memory which facilitates off-loading of the major communications functions and management of devices. This leaves the central processor free to run applications, removing the burden of simultaneous communications and applications processing.

The ACPA board serves as the communications hub for the continuously growing AdLANtes product family of LAN and WAN communications software, encompassing Ethernet based DOS-Server, RFS and TCP/IP products as well as X.25, 3780 and 3270 SNA/SDLC.

These features provide the Series 1000 with the ability to communicate with a large range of computer equipment from terminals and PCs to other Altos systems.

Storage

A wide range of storage options are available for flexibility and expandability. Each Series 1000 includes a floppy disk drive and a SCSI hard disk drive. A second half-height hard disk drive may be added to systems with a single half-height drive. A streaming tape drive is included in all systems except the entry level configurations.

The floppy disk drive is a dual speed, double sided, double density 5.25-inch disk drive which uses normal (.72 MB formatted) or high capacity disks (1.2 MB formatted). It can also read 320/360 KB formatted diskettes from PC/AT floppies.

Data transfer is at either 250 Kbps or 500 Kbps.

The ¼-inch SCSI streaming tape drive provides read/write support for both the QIC-120 (15 track) and the QIC-150 (18 track) formats. These provide 125 and 150 MB backup capacity on DC600A and DC600XTD cartridge tapes respectively. Format is automatically determined by cartridge tape recognition by the tape drive. The SCSI tape drive will also read 60 MB tapes recorded in QIC-24 (9-tracks) format by other Altos systems.

The Series 1000 will support two 5.25-inch half-height or one full-height SCSI disk drives internally. Entry-level configurations include a half-height 40 MB disk drive. Other configurations include either a half-height 90 MB disk drive or a full-height 150 or 300 MB disk drive.

Altos System V/386

The Altos 386 Series 1000 is the *first* computer system to offer an operating system with UNIX System V Release 3.1 capability with XENIX compatibility. Based on the industry standard UNIX System V.3.1, the Altos system provides the first merged UNIX and XENIX operating system.

Altos technology, UNIX standards from AT&T, and Microsoft XENIX popularity, Altos System V/386 provides binary compatibility with:

• AT&T's UNIX System V.3.1.
• Microsoft's XENIX V/386
• Altos' XENIX V/286
• Altos' XENIX V/386
• Santa Cruz Operations' XENIX System V/286
• Santa Cruz Operations' XENIX System V/386

So, software developers, systems integrators and end-users now have a computer with an operating system that executes applications written for any of the compatible operating systems with little or no modification. The number of software applications available increases dramatically.

Standard features of Altos System V/386 include:
• Demand Paging and Virtual Memory
• Record and File Locking
• Synchronous "Block Writes"
• Semaphore and Shared Memory Operations
• Symbolic Links
• Transparent Printer Support
• UNIX System V Print Spooler
• Loadable Device Drivers
• Shared Libraries
• Error Logging
• SCSI Support
• Network Support
• Altos Office Manager (AOM) Menu System

The basic operating system kernel, Altos' AOM Menu System, Bourne Shell, C Shell, Business Shell, vi text editor, communications utilities, plus all basic UNIX commands and utilities needed to install and run applications are all provided with Altos System V/386.

Applications Software

A full complement of horizontal applications software are available for the business environment. AIO (the Altos Integrated Office) is a complete suite of productivity tools. The AIO Basic Office System includes a word processor, a Lotus 1-2-3-like spreadsheet and an INFORMIX® SQL compatible database. The AIO Advanced Office System, which is an add-on module, includes electronic mail, calendar, a personal organizer, formfill, report writer, and

card index. Altos also offers both the INFORMIX SQL and ORACLE database management systems; DOS crossover products including WordPerfect,® SCO Professional™ and SCO FoxBASE+™; and a number of other productivity solutions.

Diagnostics

A built-in suite of "Power-On" tests contained in ROM-based firmware on the main logic board confirms the operational status of major system components, including the minimum hardware configuration, identity of any missing or failed subsystems, and communications within the system.

"System Confidence" tests are menu-driven and run from the system console. They allow nontechnical users to test the full functionality of the system.

Support

Altos Customer Support fully integrates the Series 1000 into its Productivity Plus programs. These include:
• Technical Support—A comprehensive multi-media program for technical assistance.
• Training—Basic and advanced classes offered year-round in both hardware and software. In San Jose, California or, by special contract, at any location.
• Service Contracts—Fast system service through field service centers.
• Advice Line—Telephone support for the user on system administration.

Development Tools

The Altos 386 Series 1000 is the ideal environment for software design, development and maintenance.

Software tools available include BB^x Progression/2, MBASIC Compiler, MBASIC Interpreter, LPI BASIC, C, LPI COBOL, RM/COBOL Version 2, RM/COBOL-85, VS COBOL, LPI FORTRAN, and LPI Pascal.

Altos offers INFORMIX 4GL (a fourth generation language), ESQL/C and ORACLE Pro*C as database oriented development tools. C-Chart /GKS is available for developing charting applications.

A UNIX System V/386 Development System is also available which includes a C compiler, linker and development tools. Both X.OUT and COFF development environments are supported. A conversion utility for X.OUT and COFF are included as are standard UNIX development tools like make, yacc, lex, Source Generation System (SGS), and Source Code Control System (SCCS).

A Documenter's Workbench provides several powerful text formatting utilities useful in documentation development including nroff, device independent troff, spell, macros and related programs.

Specifications

Main Logic Board

CPU Section

• Main Processor	80386
• Clock Frequency	16 or 25 MHz
• CPU Data Bus Width	32 bits
• CPU Address Bus Width	32 bits
• Cache Memory	32 KBytes
• Floating Point Processor	80387 (optional)
• FPP Frequency	16 or 25 MHz

I/O Section

• I/O Controller	80186
• Clock Frequency	7.3 MHz
• Local Memory	128 KBytes with Byte Parity Checking
• Async Only Ports	7
• Async Speed	300 to 19,200 bps
• WorkNet/Async Ports	1
• WorkNet LAN Speed	1.4 Mbps
• ADMA Controller	82258
• Floppy Disk Controller	WD37C65
• SCSI Controller	WD33C93
• External SCSI Port	1 (optional)

System Memory Section

• Addressable RAM	0 or 4 MBytes with Byte Parity Checking
• Data Transfer Rate	Up to 18.3 MB/sec
• Transfer Word Length	8, 16, 24, or 32 bit

Main Memory Expansion

• Minimum System Memory	2 MB
• Maximum System Memory	16 MB
• CPU Section	0 or 4 MBytes

Chassis Section

• Number of Slots	3
• RAM Expansion Sizes	2, 4, or 8 MBytes

Chassis Dimensions

• Height	20 inches
• Width	7 inches
• Depth	20 inches
• Weight	Approx. 63 lbs.

Environmental Standards

• Temperature Operating
+ 40 to + 90 degrees Fahrenheit
(+ 5 to + 32 degrees Celsius)
Storage
− 4 to 140 degrees Fahrenheit
(− 20 to + 60 degrees Celsius)

• Relative Humidity
Operating
20 to 80% non-condensing
Storage
10 to 90% non-condensing

• Thermal Gradient
Maximum (operating)
+ 18 degrees Fahrenheit/hour
(+ 10 degrees Celsius/hour)

• AC Power Range
115 VAC   90 to 127 VAC
230 VAC   195 to 253 VAC

• Line Frequency Range
47 to 73 Hz

Cartridge Tape Drive

Maximum Number	1 Half-Height		
Interface	SCSI		
Form Factor	5.25 inch		
Media Size	¼ inch		
Operating Mode	90 ips, Streaming		
Recording Mode	NRZI		
Capacity	60 MB	125 MB	150 MB
Format	QIC-24	QIC-120	QIC-150
Number of Tracks	9	15	18
Media Type	DC600A	DC600A	DC600XTD
Support	Read Only	Read/Write	Read/Write

Hard disk Drive Options
- Maximum Number
  1 Full-Height or
  2 Half-Height drives
- Form Factor   5.25 inch
- Interface   SCSI
- Capacity/Height/
  Avg Access Time
    40 MB/HH/40ms
    90 MB/HH/17 ms
    150 MB/FH/23ms
    300 MB/FH/23 ms

Floppy Disk Drive
- Maximum Number
  1 Half-Height
- Media Type
  Double-sided/Dual Density
- Media Size   5.25 inch
- Media Capacity   High Density
  Unformatted   1.6 MB
  Formatted   1.2 MB
                               Low Density
  Unformatted   1.00 MB
  Formatted   0.72 MB

Serial Communications Expansion
- Number of Chassis   2
  Slots
- Serial I/O Board
  Number of Ports   8 RS232
  Connector Type   DE-9
  Speed   300 to
                                  19,200 bps

Safety Standards
- Meets FCC Docket 20780 Class A
- Meets UL Approval
- Meets CSA Approval
- Meets TUV (VDE 0806) Approval
- Conforms to IEC 380 Standard
- Conforms to VDE 871 Class A

Warranty
This Altos product comes with a
90-day limited warranty.

Ordering Information
Prices and ordering information for
this product are available through
your Altos representative.

(ALTOS®)