

ALTOS

ALTOS System V/386 Operating System



The ALTOS
System V/386
Operating System

Altos System V/386 continues Altos' technological leadership by offering a powerful UNIX/XENIX merged product that combines AT&T's UNIX standards, Microsoft's refinements for commercial use, and Altos' enhancements, which take advantage of the Altos system architecture and provide ease of installation, use, and maintenance of Altos systems.

Although the roots of AT&T's UNIX can be traced to the late '60s, the operating system first became commercially available in the late '70s. Microsoft's UNIX-derived operating system, XENIX, became the leader in the proliferation of UNIX and UNIX look-alike products to follow on the Intel architecture. Altos, a leader in recognizing the power of UNIX, has supplied the XENIX operating system for our Intel based (8086, 80286 and 80386) and the UNIX operating system on our Motorola-based computers (68000 and 68020) since 1982.

Software developers and end-users benefit with Altos System V/386 in several ways. Existing software that operates on Altos XENIX System V/386 will run without modification under Altos System V/386 eliminating the costs associated with

developing compatible software. For software developers, increased standardization and portability maximizes the return on your development dollars by minimizing your maintenance and porting costs. End-users benefit from the increased standardization because a wider range of software will now be available.

Altos Enhancements

Included with Altos System V/386 is the Altos Office Manager (AOM) a powerful and easy-to-use menu system that eliminates the need for any direct interaction with the operating system. Altos computers can be configured so that AOM Menu System automatically appears when you log on to the system. The AOM Menu system is comprised of eight "pages" of screens, with four quadrants each, called "menus." Individual applications are easily installed in each menu, with up to six functions displayed as separate "point and pick" selections. Applications may be

easily added, moved or removed from the menu system by the System Administrator through a special AOM page called the Menu Manager.

The AOM Menu System enhances Altos System V/386 in two important areas—system administration and program selection.

System Administration

With the AOM Menu System, the System Administrator can complete system maintenance tasks quickly and easily without prior UNIX knowledge:

- Program Installation—All Altos applications are designed for simple installation under the control of the AOM Menu System.
- System Configuration—Adding users or configuring ports is a quick and painless process using the AOM Menu System.
- File Backup and Restore—Pre-defined backup routines provide backup of individual files and directories, the complete UNIX file system or files modified since the previous backup.
- UNIX Utilities—Easy-to-understand AOM Menu selection such as “Create New Directory” or

“Change File Permissions” replace advanced operating commands such as mkdir and chmod. The new or occasional user works effectively without mistakes or constant references to the manual.

- Special Utilities—Special functions on the Menu Manager page, such as setting permissions on certain menus and changing the name of a page, give the System Administrator flexibility to configure and maintain the AOM Menu System.

Program Selection

The new or occasional user will find the AOM Menu System a friendly way to access often-used programs.

Applications are initiated by moving the cursor to the desired function with the arrow keys and pressing RETURN. Upon exiting the program, the AOM Menu System returns and awaits the next selection.

AOM Tool Kit

Available separately, the AOM Tool Kit provides the tools and instructions needed by the Altos reseller or software developer to perform the following functions:

- Integration of Vertical Applications—Third-party developed software

to install and operate from the AOM Menu System as easily as Altos-supplied software. The Altos reseller is able to provide a professional, turnkey solution.

- Customization—Menu displays can be customized for installation by adding text or changing terminology, including translation to other languages.

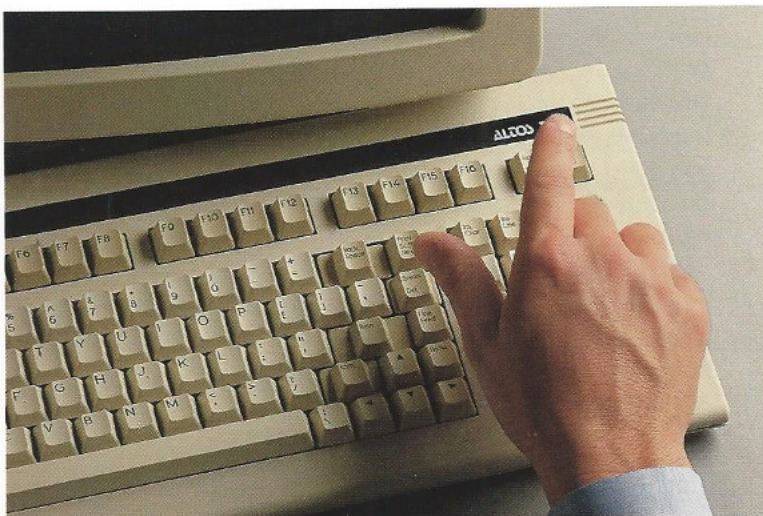
In addition to AOM and its applications, Altos provides a full complement of software solutions. These include the Altos Accountant Level III—a general accounting program, INFORMIX SQL and ORACLE Database Management Systems, and AOM II Plus—a complete suite of office productivity tools combining word processing, spreadsheet, file management, electronic mail, graphics and calendar management in one menu-driven program. Also available is Prochart, a business presentation graphics product based on the GKS standard, which produces eight chart types, such as bar and pie and combinations of these chart types.

Performance

Demand Paging and Virtual Memory

Altos System V/386 takes advantage of the advanced architecture of the 80386, which allows demand paging and virtual memory capabilities.

With demand paging, all of an application program does not have to be in RAM to execute. This feature saves memory for other processes. Virtual memory capabilities provide the ability to run programs that are larger than the physical memory available in the system.



Compatibility With Altos System V/386

	Source	Object	Application
Altos XENIX System III/286	Yes	No	Yes
Altos XENIX System V/386	Yes	Yes*	Yes
SCO XENIX System V/286	Yes**	No	Yes
SCO XENIX System V/386	Yes	No	Yes
Intel/AT&T UNIX V.3	Yes***	Yes	Yes
Microport UNIX V.3	Yes***	Yes	Yes

*Object compatibility is possible with the use of "-omf" option to the C compiler.

**If 80286 "C" source code does not depend on 16-bit integers it will compile and run on Altos System V/386 without modification. The 80286 "far" and "near" keywords are ignored by the Altos V/386 "C" compiler.

***The "C" compiler delivered with these products is based on the AT&T portable "C" compiler (pcc) while Altos uses the Microsoft "C" compiler. Depending on how "C" programs were written using pcc, some modification may be necessary to run under Altos System V/386.

Compatibility

Altos System V/386 protects your investment in application software with built-in compatibility with popular operating systems in the UNIX market today.

Altos System V/386 is based on the industry standard, AT&T UNIX System V Release 3.1 with XENIX compatibility incorporated as well.

Altos System V/386 supports both X.OUT and COFF (Common Object File Format) applications. COFF is the standard object and application file format for AT&T's V.3. System utilities for transferring files between Altos System V/386 and MS-DOS formatted diskettes are also provided.

Altos System V/386 Features

- **Record and File Locking**—Altos System V/386 provides multi-user support by controlling simultaneous access to files while maintaining data integrity on a record level. Record and file locking extensions allow an application to lock an

entire file or any record within the file, to prevent corruption of a record or file by having more than one user access the file at the same time.

- **Synchronous "Block Writes"**—Altos System V/386 provides features required to update file and directory information on the hard disk prior to returning control to the application, rather than at a later time when system buffers are flushed. This feature provides data integrity assurance.
- **Semaphore and Shared Memory Operations**—Within Altos System V/386, semaphores synchronize the process of dividing large programming tasks into several smaller concurrently executing tasks, and provide exclusive use of a resource or shared variable. Shared memory operations provide a means by which cooperating processes can communicate rapidly.
- **Symbolic Links**—Altos System V/386 allows files or directories to be linked across expansion disks, or even disks on other systems via Remote File Sharing (RFS), AdLANtes or WorkNet II, Altos's inexpensive local area network.

Symbolic links enable files to be located over many hard disks in a manner transparent to the user.

- **Transparent Printer Support**—Altos System V/386 supports printer connection via the auxiliary port of your Altos terminal. Transparent printer support provides accessibility to a printer and "saves" a port on the computer for another user.
- **Altos System V Print Spooler**—Altos System V/386 print spooler allows you to schedule jobs for the printer. Now you can manage your printing resources by controlling how and when they are used.
- **Loadable Device Drivers**—Software developers can now add custom drivers to applications without packaging a customized operating system kernel within the product. Loadable device drivers increase flexibility for developers and make supporting customized software easier since the developer only has to support a customized driver, not the customized driver and a customized operating system kernel.
- **Shared Libraries**—Altos System V/386 allows COFF (Common Object File Format) binaries to share library code in RAM, rather than loading a separate copy of each library routine with each application. This method saves RAM and hard disk space for other uses.
- **Error Logging**—Altos System V/386 makes use of the standard UNIX method of recording system errors. Error messages can be sent to the console, a file or both rather than just broadcasting them on the CRT. The ability to send the

messages to a file allows the System Administrator to review the file to understand the system status.

- **UPS Support**—With Altos System V/386, you can connect an Uninterruptible Power Supply (UPS) to the system. Your system can be secured in a power failure by either shutting the system down gracefully to insure data integrity or by saving the exact state of the system. When power resumes you can either restart your programs, or the exact state of your system prior to the power failure will appear on your terminal.
- **SCSI Support**—Altos System V/386 allows you to connect SCSI (Small Computer System Interface) peripherals to your Altos 386 system. Altos provides driver support for internal 120 Mb and 150 Mb cartridge tape drives.

Languages

Altos offers an ideal environment for software design, development, and maintenance with many different language options including BASIC, C, COBOL, FORTRAN, Pascal and RPG II.

BASIC

BB[®] Progression/2

- Provides source compatibility with MAI BASIC Four and Thoroughbred Business BASICs
- Supports unparalleled error checking and escape handling
- Allows multi-keyed files with up to sixteen keys
- Offers full screen editor

MBASIC Compiler

- Optimized to increase speed and decrease program size
- Supports sequential, random and ISAM file access
- Source compatible with MS-DOS version

MBASIC Interpreter

- Powerful and versatile; handles error trapping, trace commands and automatic line numbering
- Editing facilities and special disk commands support application development and on-line debugging
- Source compatible with MS-DOS version

LIP-BASIC

- Generates fast, compact native code
- Provides compatibility with CBASIC and MBASIC compilers
- Utilizes "component architecture," providing the ability to mix source code from different LPI languages into a single program.

C

- Supplied with the Altos System V/386 Development System
- Full Kernighan and Ritchie implementation
- Generates 386 instructions and addressing modes
- Supports the 80387 math co-processor
- Full shared library support
- Ability to generate both COFF and X.OUT executables

COBOL

LPI-COBOL

- GSA-certified compiler implementation of the ANSIX 3.23-74 COBOL at the high level

- Includes numerous extensions to provide RM/COBOL compatibility as well as facilitating each transport of IBM/370 programs and earlier COBOL-68 programs
- Supports LPI's common, multi-keyed, indexed-sequential file handler and an efficient SORT program

RM/COBOL Version 2

- Low intermediate level GSA-certified implementation of the ANSI X3.23-74 COBOL standard
- Generates intermediate code files in a single pass, which can be linked with C programs
- Includes relative and indexed access methods at the full ANSI level 2 capability
- Creates compact object code, overlay segments, and dynamic memory allocation
- Includes utilities for the maintenance of indexed files

RM/COBOL-85

- Certified at the high level for ANSI X3.23-74 COBOL with ANSI X3.23-85 intermediate-level certification and IBM VS COBOL extensions
- Provides fast compilation and application execution
- Source compatible with RM/COBOL, version 2
- Can call assembly and C subroutines
- Fast, efficient I/O performance
- Includes SORT/MERGE capability



COBOL/2

- Certified at the intermediate level for ANSI X3.23-85 and at the high level for ANSI X.23-74 GSA standards
- European X/OPEN standard
- Extensive compatibility with IBM OS/VS COBOL, IBM VS COBOL II, IBM COBOL/2, DG Interactive COBOL, RM/COBOL
- Generates fast 80386 native code
- Allows very large programs up to 256 Mb of data and 16 Mb of procedure code without segmentation

FORTRAN

LPI-FORTRAN

- Full implementation of ANSI X3.9-78 FORTRAN with extensions for FORTRAN-77
- Fully supported by LPI's interactive source-level debugger, LPI-Debug
- Interprogram communications between LPI-FORTRAN and other LPI languages

PASCAL

LPI-PASCAL

- Full implementation of ISO/7185 Level 0 and ANSI/IEEE 770 X3.97-83 Pascal standards
- Extensions for compatibility with most widely used Pascal dialects, including UCSD Pascal

RPG II

LPI-RPG II

- Compatible with IBM System/3, System/34, and System/36
- A true compiler, producing fast compact object code
- Multiple, user-selectable optimization levels

Communications

Altos offers complete communications capabilities for the Altos 386 Series. Please consult your Altos

reseller for specific information regarding availability and system configurations supported.

AdLANtes (Advanced Local Area Network Telecommunication System)

Altos AdLANtes, sophisticated network software that runs on any Altos host equipped with an Altos Advanced Communications Processor Attachment (ACPA) or ACPA/E board, conforms to OSI protocol, and supports both UNIX Remote File Sharing (RFS) and DOS IBM NET-BIOS. This allows both the UNIX and DOS servers to coexist on the same Local Area Network, and provide a friendly environment of UNIX and DOS resource-sharing. WorkNet II is also supported, but cannot coexist with AdLANtes.

PC Path

PC Path allows IBM and compatible PCs to become a node on the AdLANtes or Altos WorkNet II Local Area Network. This gives the PC users the ability to use the hard disks on the Altos systems as if they were local devices. Other resources available on the Altos hosts such as tapes, printers, and modems can also be used by the PC as if they were locally attached. In addition, PC Path provides a terminal emulation capability which allows the PC to act as an Altos compatible terminal. This lets the PC user run any UNIX/XENIX application available on the Altos systems attached to the network. The product consists of a half-slot sized 8-bit PC board and DOS-based software. No Altos host processor modifications are necessary to run PC Path.

Altos Async

Altos Async provides a low-cost, easy-to-use communications program for the "casual telecommuter." Altos Async can be used with any of the communications ports on the Altos system. In addition to a menu-operated interface, Altos Async provides a simple and reliable file transfer facility that uses the "xmodem" protocol for reliable movement of information between systems.

3780 Plus Emulator

With the 3780 Plus Emulator, Altos users can exchange files and messages with remote mainframes or minicomputers that support the 2780/3780 protocol. The emulator makes a standard ASCII terminal act like an IBM 2780 or 3780 Remote Job Entry (RJE) terminal. ASCII text files or binary files can be transmitted or received using the emulator. Files downloaded from the remote system can be displayed on the terminal, sent to a printer, or automatically stored on a local disk file.

3270 SNA/SDLC Emulator

The 3270 SNA/SDLC Emulator gives Altos users interactive access to remote mainframe databases and applications such as TSO, IMS, and CICS. With this software the Altos system emulates a remote IBM 3274-41C control unit (PU2). Up to 32 terminals and printers can share a single synchronous SDLC connector to the remote mainframe. In addition, the product supports the extended data stream option which

provides file transfer to and from the host and the Altos system. The emulator makes standard ASCII terminals and printers act like IBM 3278 terminals (LU2) and 3287 printers (LU1 and LU3).

X.25 Communications

X.25 gives Altos users access to Public Data Networks (PDNs) as an inexpensive method of exchanging data with computer systems spread over wide geographic areas. Altos' X.25 package is certified for operation on the Telenet and Tymnet PDNs. The Altos X.25 software provides two primary capabilities: X.3/X.28 PAD emulation and X.29 host capability. The software also provides a utility for transferring files between Altos systems across a PDN.

Honey-Danber UUCP and CU

Altos offers a two communications utilities as part of the standard operating system. The Honey-Danber UUCP and CU communications utilities are included within the Altos System V/386 Run-time System. These industry standard UNIX V.3 file transfer utilities are easy to use and maintain.

Flexibility

Altos System V/386 is packaged for flexibility:

- **Run-time System**—Provides the basic operating system kernel and support for up to 128 users (less users for some of the Altos 386 Series). It also contains the AOM Menu System, Bourne shell, C shell, Business shell, vi(C) text editor, communications (uucp, cu, ftp, etc.) and all utilities and basic commands needed to install and run applications.

- **User Upgrade**—Provides support for up to 128 users on certain Altos 386 models. Total number of actual users on the system depends on many variables including amount of RAM and types of applications.
- **Development System**—Consists of the C compiler, linker and assembler (both the linker and assembler support X.OUT and COFF). Conversion utilities for X.OUT to COFF are available within the Development System. It also includes several standard UNIX development tools such as make, yacc, lex, Source Generation System (SGS), and the Source Code Control System (SCCS).
- **Documenter's Workbench**—Provides several powerful text formatting utilities that are useful in the development of documentation including nroff, device independent troff, spell, macros, and related programs.

Altos-qualified Peripherals

The following peripherals have been qualified by Altos:

- **Terminals:** Altos II, Altos III, Altos IV, Altos V, Visual Technology 613
- **Printers:** Cannon A2, Data Products LB615, Diablo 630, Epson FX80, HP Laserjet, HP Laserjet +, Okidata 193, Quadram Quadlaser
- **Plotter:** HP 7475a
- **Modems:** Hayes 1200, Prometheus 1200, Universal Data Systems 4.8Kbps

Many other popular peripherals are also compatible with Altos systems. Please consult your Altos reseller for more information.

Documentation

Run-time System

Altos System V/386 Installation
XENIX/UNIX Using the AOM
Menu System

Altos System V/386 User's Guide

Altos System V/386 Operations
Guide

Altos System V/386 Reference
(C,M)

Development System

Altos System V/386 Reference
(CP, S, F)

Altos System V/386 Programmer's
Guide

Altos System V/386 C Compiler
Library and User's Guide

Altos System V/386 C Compiler
Language Reference

Altos System V/386 Macro
Assembler User's Guide and
Reference

Documenter's Workbench

Altos System V Documenter's
Workbench, Volume One

Altos System V Documenter's
Workbench, Volume Two

System Requirements

Main Memory Requirements

The standard release of the Altos System V/386 Run-time System requires approximately 2MB of RAM dedicated to the operating system and includes all the floppy, hard disk, and tape drivers for standard Altos system configurations. Systems configured with AdLANtes/RFS, Ethernet and other optional products will increase operating system RAM requirements. See datasheets on these products for more information.

For RAM requirements per user please contact your Altos reseller or distributor for more information.

Hard Disk Requirements

The Altos System V/386 Runtime occupies approximately 15 MB and reserves another 5 MB as the default swap area on the hard disk. The Altos System V/386 Development System utilizes approximately an additional 6 MB of hard disk space and the Documenter's Workbench requires approximately an additional 4 MB of hard disk space.

Ordering Information

Order Altos System V/386 operating system separately at the time you order your specific computer system configuration. Please consult your Altos reseller for more information.



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