

11/1981



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**"We don't make toys at Altos. While most microcomputer companies are knocking heads in the bottom-end personal computer market, we're building multi-user systems for serious business users."**

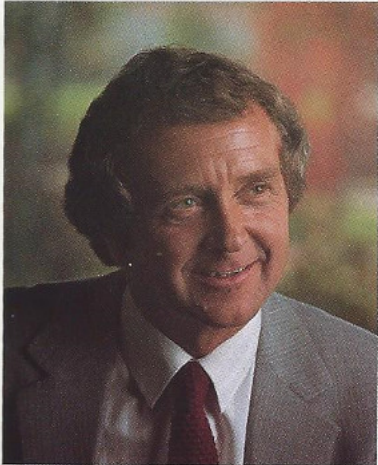
Dave Jackson  
President

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## Altos — Growing in silicon valley.

Nov 1981



In Silicon Valley, where semiconductors and computers grow like cabbages, one company has emerged as the leader in hard disk-based multi-user business microcomputer systems. That company is Altos.

In four short years, Altos sales have grown from \$200,000 to \$60 million. In 1981 the company formulated a five year plan with a sales goal of a half-billion dollars.

While maintaining this explosive growth rate, Altos has not sacrificed profitability or long-term potential. Growth has been privately financed primarily from earnings. And the company continues to increase investment in research, development, and customer services to assure its future.

Serving system integrators and end-users, Altos ships more than 1,200 systems each month throughout the world. Customers range in size from small retailers to Fortune 500 companies; in applications, from basic word processing and accounting to sophisticated software development.

You can find Altos systems at your local pharmacy and in the United Nations building. Some are highly visible, displayed in computer stores worldwide. Other Altos computers are hidden, quietly working in process control, instrumentation and other computer-based equipment.

As Altos has established a mature OEM and end-user customer base, the company has gained a unique understanding of computer user needs and problems. As Dave Jackson, Altos president, explains, "We took a long, hard look at what system integrators and business end-users wanted in a computer system, then we built it. In brief, they wanted more capability for less money. Single user systems are not an efficient way to support the many needs of a business, so we designed machines with large mass storage capability that serve multiple users performing multiple tasks.

"We also recognized that as our customers grew, their needs would change, so we built systems that provided optimal expandability and flexibility. For example, Altos users can increase RAM for additional users, and disk storage from ten megabytes to one hundred. We offer both eight and sixteen-bit computers.

"Although we are proud of our cost-effective, state-of-the-art single board microcomputers, hardware is only a partial solution. That's why our systems offer the widest selection of standard commercial operating systems, languages and application programs available."

But Dave Jackson is quick to point out that having the right product for the right market isn't enough. "There is no shortage of good ideas in the computer business. What has been lacking, however, is the stable organizations necessary to execute those ideas. Our strength is that we brought in the best people and kept them. From assemblers to top management, we enjoy the lowest turnover in the computer business. That organizational stability builds the competence necessary to serve a high technology market."

Everything Altos has done to this point is only a foundation for future growth. As Dave Jackson says, "IBM may dominate the mainframe market. DEC and Data General may lead in minicomputers. But when it comes to multi-user microcomputers, there is only one leader—Altos. We have the people, the financial resources, and the customer acceptance necessary to maintain that leadership."

No brochure can fully prove a company's capability, but the following pages will give you a closer look at Altos, and give some indication as to why this company is the leader in multi-user microcomputers.

**"Within five years, Altos will be a half-billion dollar company."**

Dave Jackson  
President



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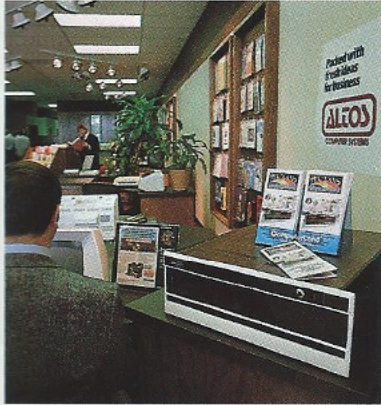
**“We give our OEM customers more hardware capability than any other microcomputer manufacturer. Our goal is to build a long-term, mutually profitable relationship.”**

Ron Conway  
Vice-President, North American Sales

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## Marketing — Delivering computer systems for business.



If marketing means serving customers, almost everybody at Altos is in marketing. This marketing orientation is reflected in every department. Altos people are excited about computers and what they can do. And that excitement shows in their dedication.

It begins at the top. Board members, such as Don Valentine, past VP of marketing for Fairchild and a co-founder of National Semiconductor, and Sid Spiegel, president of Wyle for fifteen years, help Dave Jackson formulate long range marketing strategies. Jackson also believes in president-to-president selling. "Chief executive officers have different priorities and concerns. Working directly with them gives us another channel of communications."

Key marketing responsibilities rest with Ron Conway, vice-president of North American sales. He heads two major sales organizations, one dedicated to OEM and system integrators, the second to distributors and retail dealers. In addition to the headquarters staff, six regional OEM sales offices and seven dealer support offices provide localized coverage.

According to Conway, "We serve OEM customers with a complete package — flexible computer hardware, a choice of operating systems, software support, nationwide third-party service, training, a spares program, comprehensive documentation, and help with integration. If they wish to do their own servicing, we back them with training in our own service and maintenance training school plus supplying all needed spares."

Steve Walsh, distribution sales manager, and his group provide similar services for national chains, such as ComputerLand, and for six regional distributors, who in turn support more than five hundred Altos dealers. But Altos goes beyond the typical microcomputer promotion. Walsh says, "While we give our dealers merchandising kits, point-of-purchase displays, and a co-op program, the big difference is continuing advertising in business magazines. We're bringing serious business customers to every dealer's store."

**"We back our distributors and dealers with advertising where it counts — in leading business magazines."**

Steve Walsh  
Distribution Sales Manager

### From Austria to Australia with Altos.

Altos also is strong in international markets. In fact, one-third of all Altos computers are sold outside the United States. Under the direction of Ward Gebhardt, international marketing manager, Altos maintains sales offices throughout the world. European operations, headquartered in Paris, include sales offices in West Germany, Benelux/Scandinavia, United Kingdom, and Italy. Asian/Pacific marketing is headquartered in Australia. Additional offices are planned for Latin America.

According to Gebhardt, Altos has done well internationally for three reasons — "Our international customers like the multi-user concept, appreciate our exceptional price/performance, and love our fast delivery from in-country distributor stocks." He adds that international advertising, convention exhibits, special seminars, and cooperative efforts with distributors promoting to defined markets further enhances off-shore success.

Product reliability has played an important role in the company's international success. As Bill Schwegler, head of service, says, "A computer that is dead on arrival in some small Italian town would be a disaster."



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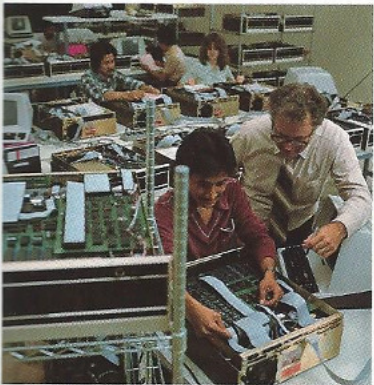
**"When you buy an Altos system, you are buying the most reliable, thoroughly tested microcomputer system available!"**

Dave Liggett  
Vice-President, Manufacturing

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## Manufacturing — Growing better computer systems.



The modern Altos plant, located in the heart of the technologically fertile Silicon Valley, California, has attracted a manufacturing team skilled in building and testing computer systems. Facilities include more than 70,000 square feet devoted to the development, assembly and testing of Altos systems.

Dave Liggett, vice-president, manufacturing, believes that quality begins with better design. He says, "Our highly developed single CPU board technology makes quality manufacturing possible. For example, while fully socketed boards make for easy repair and service, they also simplify assembly and testing. Intermittent connection failures are the biggest headache in computers. We've virtually eliminated that problem."

Altos devotes special effort to materials management. According to Liggett, "We use only the highest quality components from qualified high volume manufacturers. These suppliers are selected only after rigorous evaluation. Most are nearby so we can work with them directly to assure quality. We've also developed multiple sources to maintain an uninterrupted flow of purchased components and assemblies."

People are an important ingredient in quality manufacturing. Liggett says, "When we moved to a new plant, we didn't lose one day of production. Our people work harder and care more. It shows in their quality performance."

But Altos takes nothing for granted. An independent Quality Assurance division works for the customer to see that every Altos system meets specifications. Every incoming component, board and sub-system is tested before assembly. All boards and electrical components are subjected to a burn-in test at 140°F for one day. Computerized board testing offers both functional and parametric measures of performance. Disk drives are dynamically tested at 100°F for one day.

At every stage of assembly, quality control inspections assure conformity to Altos standards. Then in final testing, the fully configured system is run on-line for one day. This 100 percent system burn-in and inspection assures reliable performance.

Typically, Altos systems have an MTBF of 3,350 hours and are U.L. approved. This high MTBF is due to the exhaustive inspection and testing at both board and system level.

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**"We're only as good as what we ship."**

Armando Nila  
Production Engineering Manager

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**"In the long run, better components save Altos and the customer time, money and trouble."**

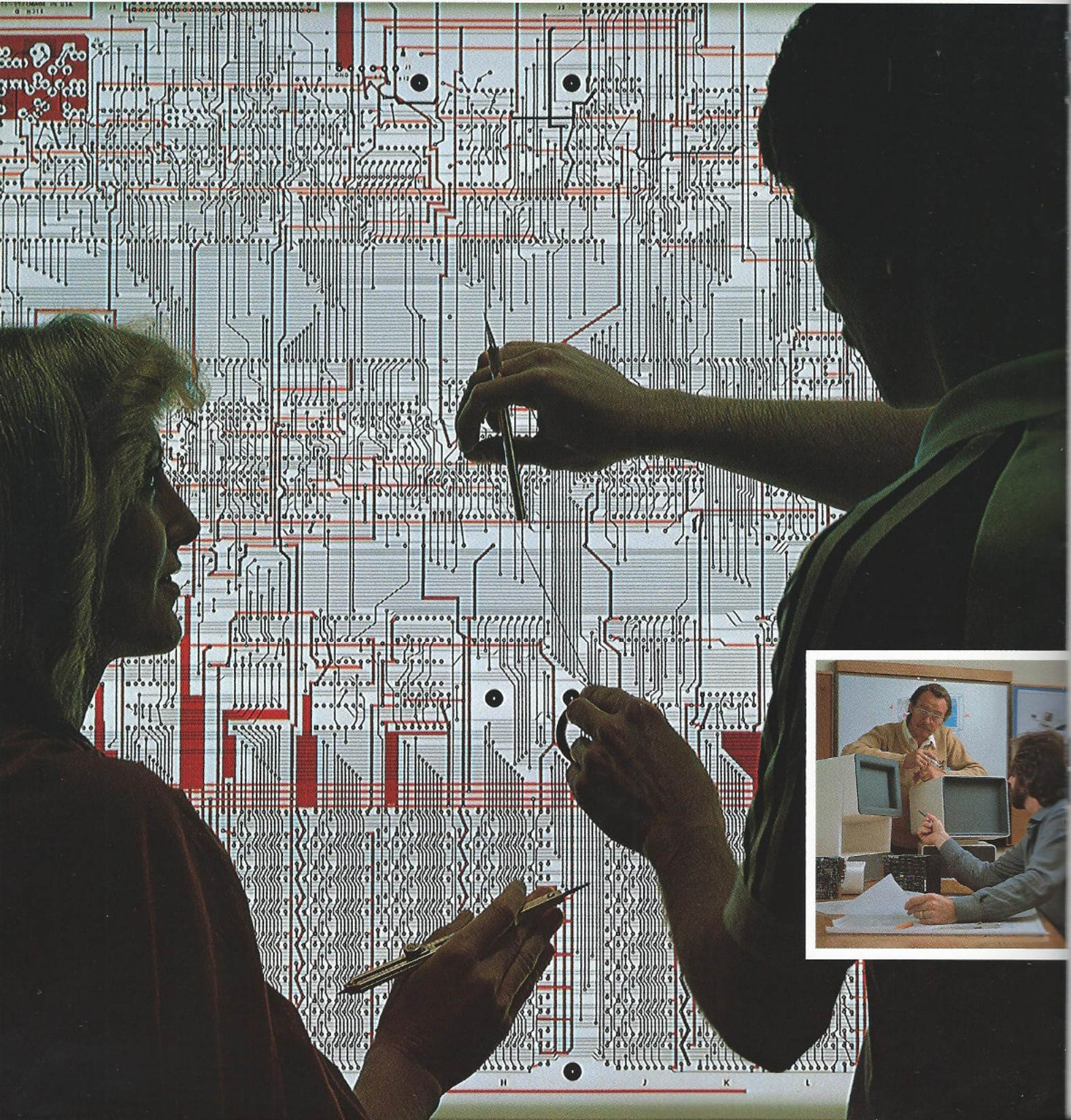
Gary Streuter  
Materials Manager

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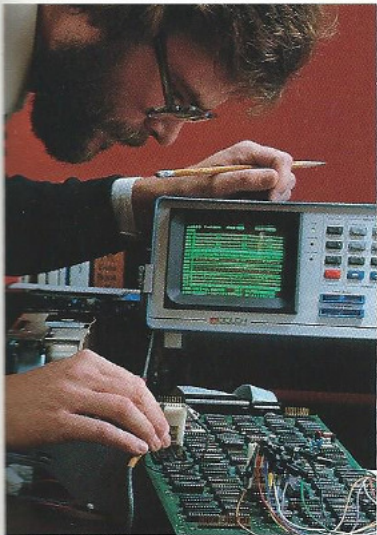
**“Our job is to improve the performance, adaptability,  
and maintainability of Altos systems.”**

Will Stinson  
Engineering Manager





## Research, development & engineering — Packed with fresh ideas.



Altos hardware development is organized into four groups. One group works on mechanical design improvements, a second on electronic design. Two other teams focus on developments related to specific processors — one on Z80A products and the other on 16-bit processors.

While each group has made independent contributions to product performance, they work together to maximize the benefits of integration. For example, the sophisticated memory partitioning used in Altos multi-user systems affects CPU, memory, and peripheral controllers. Electronic and mechanical design involves careful assessment of trade-offs.

### Processor development

Altos entered the 16-bit arena with the ACS8600. Why 16-bit? Will Stinson answers, "With the ACS8600, Altos customers can perform larger, more complex computer tasks for up to eight users. With a larger word size for more powerful instructions and direct addressing of more memory, they can do the same jobs with fewer instructions and fewer computer cycles."

And what makes the Altos 16-bit computer special? Stinson explains, "With the 16-bit ACS8600, we give Altos customers a unique set of features. Multiple processors work together to share the workload for faster execution and response time."

Better memory management is a strong point of Altos systems. According to Stinson, "Our proprietary memory management system subdivides up to one megabyte of memory into 4 KByte blocks. It maximizes the software implementation of UNIX™ on the 8086 processor. The 8086 is also a natural move for our MP/M II™ users, because MP/M II is written in PL/M, Intel's own 8086 language. Z80™ users also can move up to the 8086 with assured software compatibility."

Stinson hasn't abandoned the eight-bit world. He says, "In many applications, our Z80A-based systems offer a better performance/cost trade-off than 16-bit systems. We are maintaining an ongoing program to further enhance those advantages."

### Data storage

Altos has long been a leader in the development of better data storage. In fact, the company offers the most complete line of data storage alternatives in the microcomputer field. Stinson backs this up—"Our systems are available with ultra-reliable 5¼ and 8-inch hard disk Winchester drives with floppies and/or tape cartridge for back-up. And for those big data bases, the user can utilize our intelligent interfaces to add up to one hundred megabytes worth of Winchester disk storage at a lower cost per megabyte and with faster access, too."

### Terminals

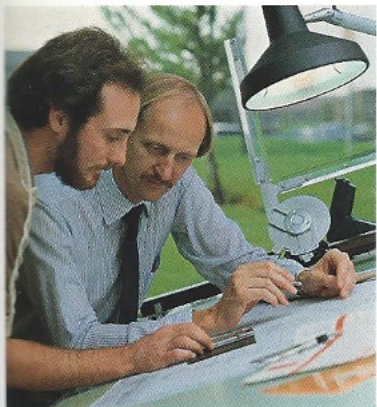
The introduction of Altos smart terminals added another dimension to hardware engineering. "For the first time," says Stinson, "we became involved with 'human engineering.' We learned that the ability to tilt and rotate the display, adjust screen brightness and move the detachable keyboard were just as important to users as the functions performed."

### Expandability.

Altos hardware engineering groups have worked hard to improve system expandability. For example, any 5, 10, 20 or 40 megabyte Winchester system can be doubled in capacity. Basic memory configuration is expandable to one full megabyte.

And through use of the Multibus™ board, Altos users can add A-to-D or D-to-A converters, Ethernet™ or IEEE-488 bus interfaces, digitizer or digital relay boards.

There's no doubt about it. Altos hardware engineering is packing Altos systems with more fresh ideas for business.



**"Continuing development of both 8-bit and 16-bit processors, combined with mechanical and electronic design improvements, gives our customers the benefits of the latest technologies."**

Will Stinson  
Engineering Manager



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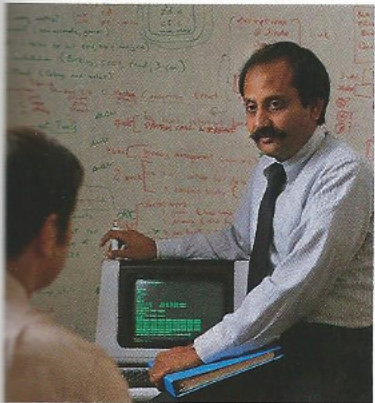
**“Software transportability is the key to our future.  
While moving from 8-bit to 16-bit operating systems,  
we are protecting the many man-years of development  
invested in MP/M II and UNIX.”**

Kapil Nanda  
Director of Software Engineering

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# Software development — Increasing the yield with productive software.



Altos systems users can choose from multiple operating systems, use a wide range of high level languages, and select from hundreds of applications packages. With optional communications packages and appropriate modems, Altos computers can be linked to other computers anywhere in the world.

This broad capability didn't just happen. Many man-years have gone into the development of Altos software. According to Kapil Nanda, director of software engineering, it's only a "promising beginning."

Perhaps the most exciting recent software development is UNIX for Altos 16-bit computers. Although new to the commercial world, UNIX, developed by Bell Laboratories, has been used for more than ten years in the academic world. The general consensus is that UNIX will become the standard operating system for 16-bit machines, just as CP/M® dominates the 8-bit market. This is why Altos is supporting UNIX in five languages — Basic, "C," Cobol, Fortran and Pascal.

Why UNIX? Nanda says, "UNIX has an excellent file structure, offers powerful programming aids, and provides a good assortment of utilities. We believe that it supplies the sophisticated tools necessary to support a multi-user 16-bit system. To assure its usefulness, we are supporting UNIX with the same languages as CP/M and MP/M II — C-BASIC, M-BASIC, COBOL, etc."

But Altos isn't taking any chances. Software engineering is also implementing CP/M-86,<sup>™</sup> MP/M-86,<sup>™</sup> and OASIS-16 for 16-bit machines. This gives new users a wider selection, and allows existing users to move up from 8-bit Altos systems.

CP/M® is Digital Research's popular operating system. Version 2.0 incorporates many new file handling and data access capabilities. It's well-suited for our smaller systems serving one user.

MP/M II<sup>™</sup> is the multi-user version of CP/M from Digital Research. It offers multiple terminal support, real time priority operation, and multi-bank memory switching. Since MP/M II supports standard CP/M version 2.0 file structures, users can move up from single user CP/M to MP/M II without reconstructing files.

OASIS, available in single and multiple user versions, is an extremely powerful operating system from Phase One Systems, Inc. It offers concurrent processing, editors for programs and text, keyed index files (ISAM), a relocating macro assembler, an interactive executive language, and a complete library of utilities. An excellent assortment of development tools helps the user create very sophisticated software.

## Networks and communications

Nanda says, "As our users move to distributed processing, we will provide networking solutions with high speed lines for both 8 and 16-bit multi-user systems. Networking capabilities include remote disk access, file transfer, spooled printer services, remote terminal access, internet gateways, and electronic mail."

The first product in this networking family is CP/NET.<sup>™</sup> This distributed processing system allows several microcomputers access to common resources via a "star" topology.

Altos offers several communications packages that allow Altos systems to communicate with other computers. These software products enable asynchronous communications between an Altos and a remote computer, bisynchronous communications using IBM 2780/3780 protocol, and IBM 3270 terminal emulation for remote job entry from Altos computers. These products are available for all Altos 8-bit and 16-bit systems.

## Applications software.

For the most part, Altos relies on system integrators and software houses to develop applications software. Nanda tells why — "Hundreds of general and specialized application packages are already available for CP/M, MP/M II and OASIS. System integrators are in a better position to tailor software to specific applications."<sup>\*\*</sup>

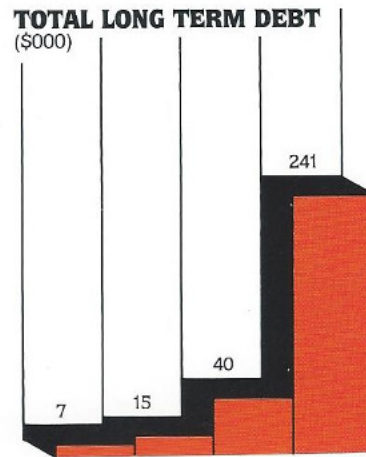
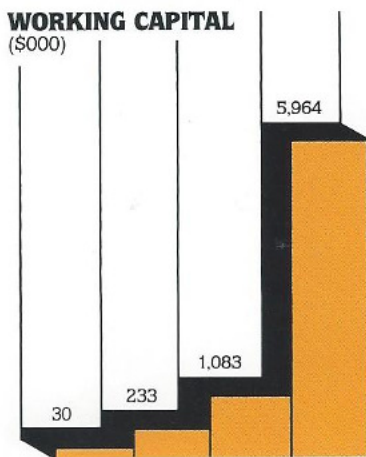
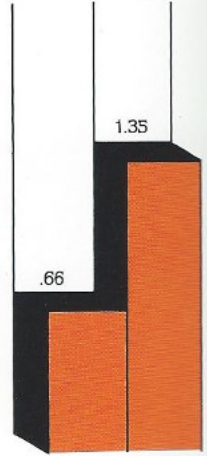
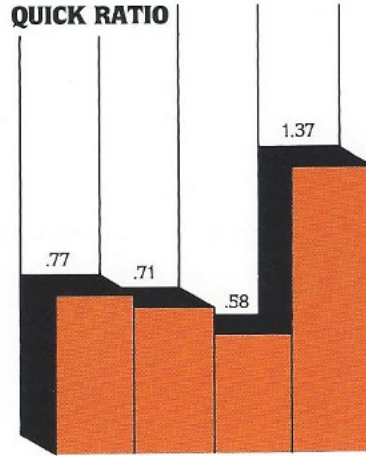
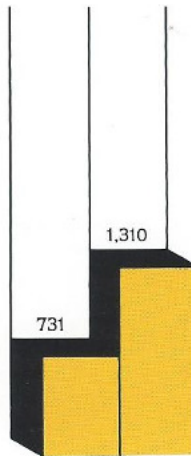
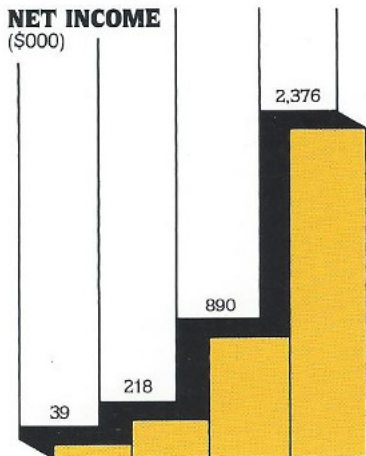
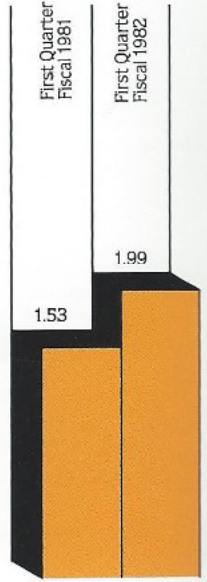
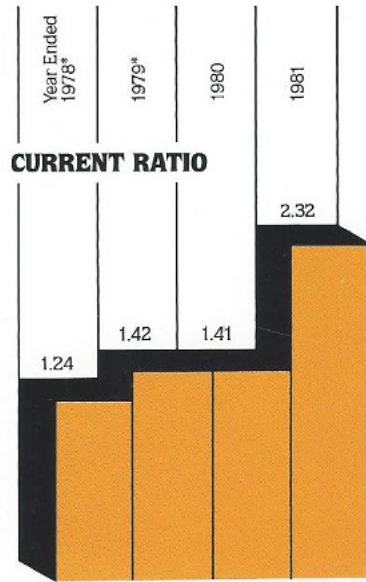
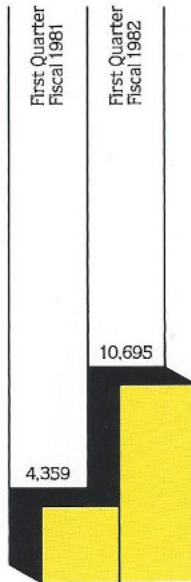
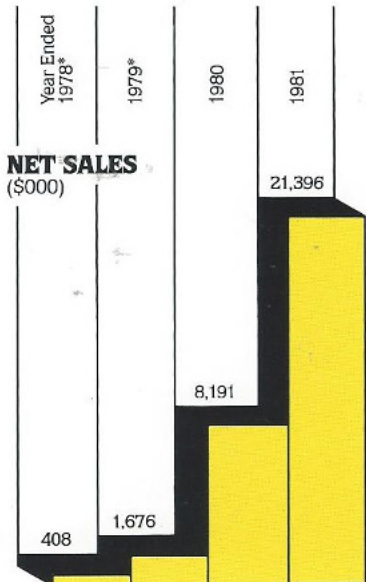
But Altos is providing some applications help. Nanda says, "We do offer some general packages, such as Wordstar<sup>™</sup> word processing and Microplan<sup>™</sup> for business analysis and planning. In addition, we are working with software houses to optimize general packages for our computers. And we are developing software that makes our systems even easier to use."

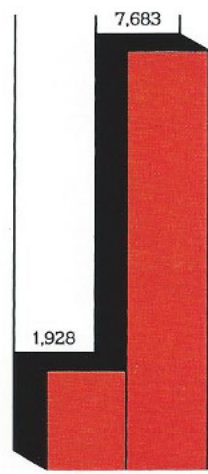
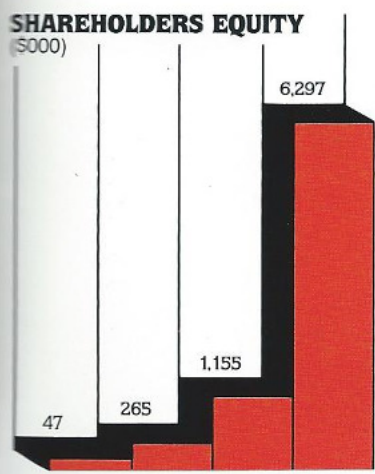
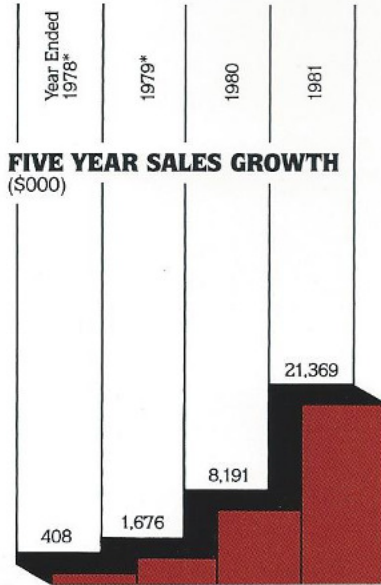
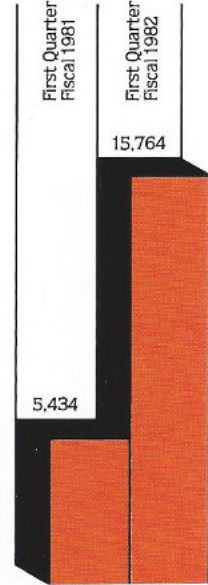
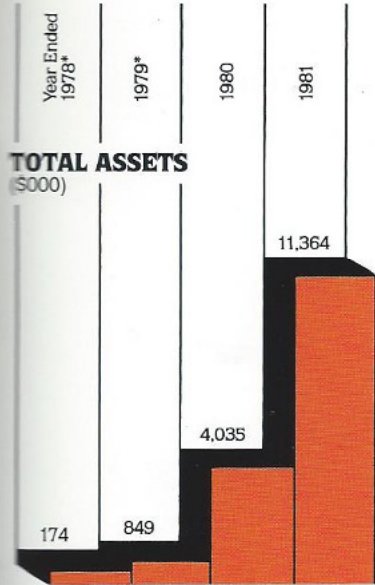
**"Altos has always provided better tools. Now we are moving toward more comprehensive solutions."**

Kapil Nanda  
Director of Software Engineering

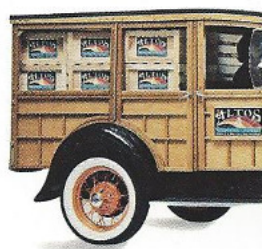


# Altos — Deep-rooted financial strength.





\*Represents nine month results due to changes in fiscal years  
 Fiscal year— July 1 thru June 30  
 First fiscal quarter— July 1 thru September 30





## **Altos — World-wide offices.**

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### **World Headquarters**

2360 Bering Drive  
San Jose, California 95131  
(408) 946-6700  
Telex: 171562 ALTOS SNJ

### **OEM sales offices**

Roseland, New Jersey  
Washington, D.C.  
Chicago, Illinois  
Dallas, Texas  
Los Angeles, California  
San Jose, California

### **Dealer support offices**

Roseland, New Jersey  
Washington, D.C.  
Chicago, Illinois  
Houston, Texas  
Los Angeles, California  
San Jose, California  
Denver, Colorado

### **International operations**

European Head Office  
39 Champs Elysees  
75008 Paris, France  
(33-1) 225-9342  
Telex: 280888 Maisal Paris

### **Sales offices**

West Germany  
Benelux/Scandinavia  
United Kingdom  
Italy  
Australia

**Packed with  
fresh ideas  
for business**



\*For complete listings of available applications packages,  
ask for the "Altos Software Guide."

CP/M is a registered trademark and MP/M II, CP/NET,  
CP/M-86 and MP/M-86 are trademarks of Digital Research, Inc.  
UNIX is a trademark of Bell Laboratories.  
Multibus is a trademark and 8086 is a product of Intel Corp.  
Microplan is a trademark of Chang Laboratories.  
Wordstar is a trademark of MicroPro International Corp.  
OASIS and OASIS-16 are products of Phase One Systems, Inc.  
Z80 is a trademark of Zilog, Inc.  
Ethernet is a trademark of Xerox Corp.

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