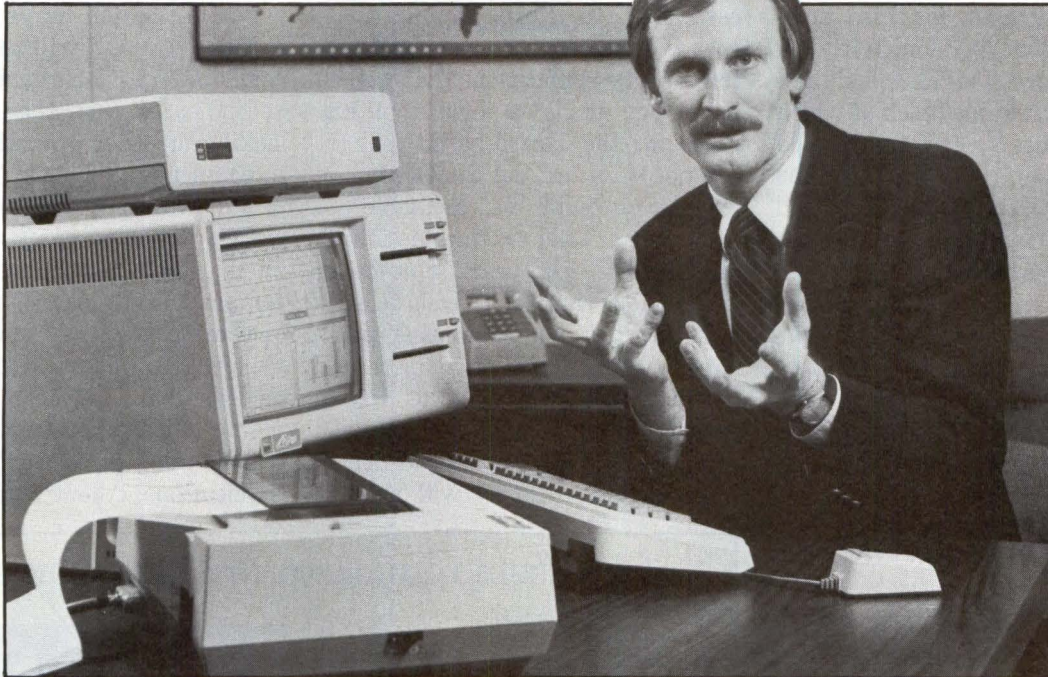Barry Smith, Apple's product marketing manager for Lisa software, *says the bundled $9995 Lisa MC68000-based microcomputer required added memory and disk space to run a complement of six proprietary application packages. The price also includes 1M byte of main memory, two built-in minifloppy drives, a Seagate 5M-byte, 5¼-in. Winchester disk drive, a keyboard with calculator keypad, a 12-in., black-and-white bit-mapped display, a mouse data-entry device, two serial ports and one parallel port, the Lisa operating system and five application packages. (Photo by Mort Thomas)*

Apple bets on proprietary software in its bid for office systems market

Apple Computer, Inc., last month became the latest vendor attempting to bring office automation to the desks of office professionals and middle managers with the introduction of its long-anticipated Lisa system. Based on a Motorola MC68000, the system is offered in a tightly bundled $9995 package that includes a proprietary UNIX-like operating system and six proprietary application packages.

With an optional Apple local-area-networking scheme, Lisa appears to be aimed squarely at the major account office-automation territory that Xerox Corp. staked out almost two years ago with its Star 8010 workstation/Ethernet combination.

The basic Lisa system is built around a 5-MHz, 16-bit MC68000 microprocessor with 1M byte of main memory implemented in 64K-bit RAMs. It includes two built-in Apple minifloppy disk drives (see "Apple to manufacture disk drives," p. 18), a Seagate 5M-byte, 5¼-in. Winchester disk, a typewriter keyboard with calculator keypad, a 12-in. black-and-white, bit-mapped display, a mouse, two serial ports and one parallel port. The $9995 package also includes the Lisa operating system, LisaCalc, LisaWrite, LisaGraph, LisaDraw, LisaList and LisaProj-

ect application packages that are, respectively, spread-sheet analysis, word-processing, business-graphics, diagram-drawing, database-management and project-management packages.

The company originally had planned to market the system in a $6995 version with 512K bytes of main memory, a keyboard, a display, dual floppy disks and the operating system, but shortly before introduction, marketing management decided to offer the bundled $9995 version instead. The added memory and disk space are necessary to run the full complement of Lisa software efficiently,

says Barry Smith, Apple product marketing manager for Lisa software. The $9995 version, with the added memory, rigid disk and application programs (each of which was to have been separately priced at $300 to $500), represents $13,000 to $14,000 worth of hardware and software, he claims.

The Lisa system is the first product of Apple's two-year-old, 70-employee Personal Office Systems division, headed by former software vice president John Couch. The Lisa project, initiated four years ago, represents a major corporate commitment to enter the high-stakes office-automation market against not only Xerox Corp., but also Wang Laboratories, Inc., and IBM Corp., among others.

However, Apple has also taken steps to retain its position in the traditional personal-computer market, in which its new office-automation rivals have already invaded Apple turf with their personal computers. With the Lisa introduction, the company announced a re-engineered version of its mainstay, the Apple II (see "E stands for extended life," p. 20).

Lisa, which stands for locally integrated software architecture, embodies many of the user interface principles that Xerox's Office Products division pioneered with its $16,500 8010 Star workstation. Both systems use a proprietary operating environment that is tied to the system hardware. Both use multiple windows on a high-resolution display to replicate papers on an executive's desk, and both rely on an electromechanical mouse device to point and select data or functions represented by symbols on the screen.

One of the key differences, and one that Apple president Mike Markkula cites as among "the most significant" aspects of the Lisa program, is a third-party software program. Unlike Star, which is restricted to Xerox applications, Lisa is expected to have an array of third-party applications that will be developed using a Lisa tool kit. Price for the Pascal-based tool kit has not been set, but Smith says he expects it will be available to software developers in the fourth quarter of this year. For other applications that Smith calls "classic high-end personal-computing packages," Apple offers developers and end users a choice of BASIC, Pascal or COBOL packages that have been tentatively priced at around $1000. Smith says FORTRAN will also be added.

While Smith says the Lisa software system will remain "married" to the Lisa hardware package, he indicates that the company is looking at other operating systems to coexist with Lisa's. "In addition to our own operating environment, we want to bring up CP/M, and we're moving on UNIX," he says. The company's own Apple DOS and SOS operating systems proved too expensive to adapt as emulation packages on Lisa, he says.

The Lisa operating system is written mainly in Pascal, as are the applications. About 2 percent of the

APPLE TO MANUFACTURE DISK DRIVES

Apple Computer, Inc., a pioneer in personal computers, is one of the first personal computer companies to design and manufacture its own disk drives. Even Apple's newest and most serious rival, IBM Corp., buys drives for its Personal Computer from Tandon Corp., a high-volume, low-cost supplier.

The new drives will be offered with the Apple III, as well as the new generation of Apple microcomputers.

Apple previously bought its drives from Alps Electronics of Japan and added electronics and heads from its head manufacturing plant in Newbury Park, Calif. The new generation of higher capacity drives—UniFile and DuoFile—will be completely manufactured at the Southern California facility. Alps will continue to supply its drives for the Apple II and will become a second source for the new generation of Apple drives.

Software and controller modifications would be required to make UniFile and DuoFile compatible with the Apple II, says Barry Yarkoni, marketing manager for Apple's Peripheral Systems Division. "Those modifications are not in the works, but that's not to say it isn't planned in the future," he says.

UniFile is a single drive unit with an unformatted capacity of 871.4 bytes, or four times the capacity of the current generation of Apple drives.

DuoFile contains two drives, for a total unformatted capacity of 1.6M bytes. To achieve that capacity, Apple will buy media from Verbatim Corp., 3M Co. and others. Apple's new drives will operate at 62.5 tpi, up from 48 tpi on the current generation of Apple drives. Apple did not go to 96 tpi for reliability reasons, Yarkoni says. "We don't believe—and our media suppliers certainly don't believe—that 96-tpi densities will provide enough data integrity for our users," he says.

The foremost consideration in the media is to the sensitivities of personal computer users, Apple officials say. Even though the Apple III and the new generation of Apples are aimed at the business market, many of the new users have not been trained in the proper care and feeding

operating system is written in assembly language, and most of that is dedicated to the graphics kernel so that Lisa can have quick graphics processing without the expense of a graphics co-processor, Smith says. He adds that Apple looked at UNIX as Lisa's operating system, but decided too many alterations would be required to attain Lisa's rapid inter-process communications and file protection.

In the near term, Apple is concentrating its efforts on selling the system through select members of its dealer network and a national accounts sales force that is expected

to reach 100 representatives—double the current level—when Lisa is shipped in late spring. About 150 dealers had previewed the system by the end of last year,

Smith says, and Apple anticipates that 15 to 20 percent of the company's 1400 domestic retail outlets will qualify to handle the new system. Dealers that qualify must demonstrate the ability to provide training and on-site support as well as the financial strength to carry a more expensive product. Other computer dealers that have found previous Apple products not sophisticated enough for their markets may sign with Apple for Lisa, Smith says.

Beyond 1983, however, the company sees "OEMs as a really big potential outlet for this product," Smith points out. Both hardware and software OEMs will be signed to address vertical market niches by 1984, he predicts. In the meantime, Apple will concentrate on selling the tightly bundled Lisa package to end users.

As in Star and the recently introduced Visi^{On} package from VisiCorp (MMS, February, p. 00), the application programs and documents created are presented as multiple, overlapping windows on the screen. Using the mouse to point and select, a user can bring a "page" to the top of the screen and shrink or expand the size of the window. The bit-mapped screen addresses 720 pixels vertically and 364 pixels horizontally.

The Apple networking scheme uses coaxial cable, which will be sold in pre-cut lengths for easy installation. Smith says the company
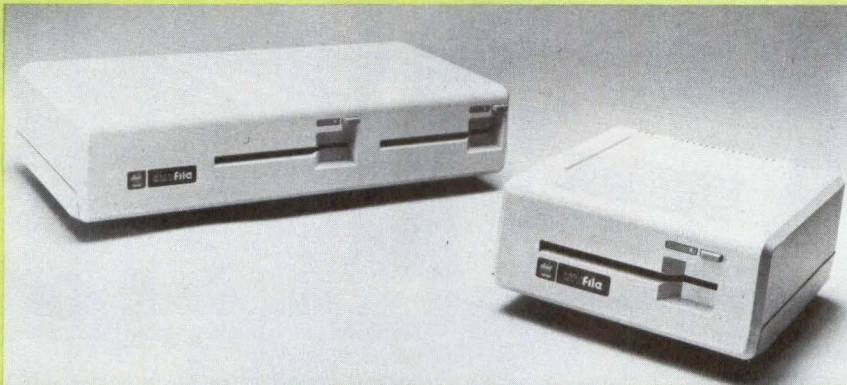
Apple Computer has redesigned its disk drives for the Apple III *and its new generation of business computers both inside and out (right). The new design stresses ergonomics on the outside and data integrity on the inside. The first generation of minifloppies will continue to be manufactured for Apple by Alps Electronics of Japan for use on the Apple II.*

of media. "Most media is made to withstand the extremes of room temperature. We have gone beyond that to allow the media to withstand temperature ranges as high as 140°," Yarkoni says.

He adds that users often move flexible media from place to place. For example, they store it in a cool place such as a briefcase in a car trunk and then take it indoors. The result is often damaged media, Yarkoni says. Use of the head-disk assembly also reduces media wear because heads are located at opposite ends and sides of the diskette, unlike a standard double-sided assembly, which posi-

tions the heads on the same end and thereby increases pressure on the media.

The drive has eight electronically controlled motor speeds, which vary from track to track to use each track to its fullest bit density. Outside tracks previously could not achieve the same density as inside tracks because of the ways the heads were moved over the diskette.

Both drives will be available in the second quarter of this year. UniFile lists at less than $1000 each, and DuoFile lists at less than $1700.

—*Robert A. Sehr*

Mini-Micro World

decided on a proprietary network instead of Ethernet or other commercially available networks to assure easy installation. Apple Net is a 1M-bit-per-sec. baseband system that uses carrier-sense, multiple-access with collision detection techniques similar to and, Smith says, "very compatible" with the Xerox Ethernet scheme. He says an Ethernet interface is under development. Apple Net has a practical limitation of 128 nodes, but is optimized for work groups in the four- to 20-node range, he adds.

He says Apple Net connections—using one of three available card slots in the Lisa cabinet—are expected to retail for $500 per terminal. The principal applications for the network are peripheral sharing and data exchange. Apple Net is expected to support Apple II and III connections as well, but plans for those products are not complete.

For communicating with corporate data-processing installations, Apple offers LisaTerm at introduction. Priced in the $300 to $500 range, the package emulates standard Teletype and Digital Equipment Corp. VT52 and VT100 protocols. Packages for IBM 2780/3780, 3270 bisynchronous and 3270 SNA protocols are expected to follow within a year.   —Geoff Lewis

AT APPLE, E STANDS FOR EXTENDED LIFE

Apple Computer, Inc., is hoping to keep its mainstay Apple II line in high-volume production through the mid-1980s, and possibly beyond, with a re-engineered version of the original machine. The Apple II, which came to the market five years ago and helped take personal computing from a hobbyist base to a worldwide business market, has reached the end of its manufacturing cycle in terms of cost reductions, Apple officials say.

Its replacement, the Apple IIe, is introduced in a $1395 configuration that includes 64K bytes of memory, upper- and lower-case characters, a full ASCII keyboard and a system disk. The price is only slightly higher than street prices for the 48K-byte Apple II+ version it replaces, which is limited to an upper-case display.

However, although both products use the 8-bit 6502 microprocessor, the IIe is more than a straightforward replacement for the aging II, product manager George Johnson notes. Not only does it offer an advance in packaging—the IIe is based on a single printed-circuit board with 31 integrated circuits that replaces the II's three-board, 109-IC design—but it also positions Apple to battle more aggressively in the growing market for unsophisticated users and international customers, Johnson says. He points out that the unsophisticated user segment now accounts for 75 percent of all personal computer purchases. That user, which Apple research defines as the well-educated consumer with an annual income of $35,000 and a desire to become a

The Apple IIe is Apple's attempt to extend the life of its popular Apple II.

computer literate, will be the main focus for Apple IIe and competitive products. Apple feels that a fully configured system package selling for around $2000 will appeal to this market and has configured a $1995 IIe with a CPU, one disk drive, a monitor, a monitor stand and an 80-column card. To address the international market better, Apple has included the full ASCII keyboard and has designed a switch for the back of the system box that will activate a choice of 15 ROM-based foreign-language character sets.

More significant for Apple is the IIe's design, which allows easy manufacture and further cost reductions. The IIe is also designed to be twice as reliable as its predecessor, says Apple engineer Walt Broedner. The CPU board can eventually be manufactured in Singapore using auto-insertion machines, robot stampings.
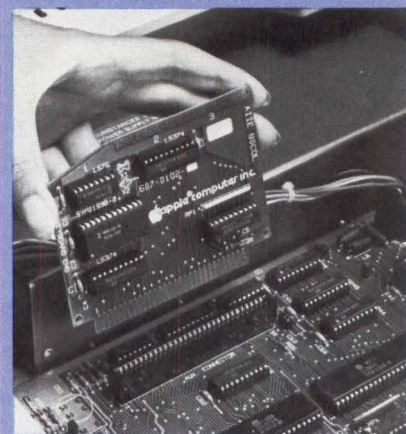
A special video display slot in the Apple IIe accepts a new low-cost 80-column card. Apple will market an additional card providing 80 columns and 64K of RAM. Apple redesigned the main logic board for the Apple IIe, using one printed-circuit board with 31 ICs instead of 109 ICs on the three-board Apple II. Both products are based on the 8-bit 6502 microprocessor.

Other improvements in the IIe address both the needs of the naive user and frequently cited shortcomings of the II. While the basic system is still restricted to 40 columns, a new 80-column card includes the 64K-byte memory expansion, taking the system to a new maximum memory of 128K bytes. That card is list-priced at $295, while the 80-column card without the memory expansion is $125. The 80-column card also includes controls for high-resolution (560 × 192) graphics. For the first time, users can combine a text window with graphics on the same screen. —Geoff Lewis