

THE APPLE LISA HANDBOOK

compiled by
Michael J Posner

*copyright 1991, 2005 © all rights reserved
.reprinted materials copyrighted by the original owner*

INTRODUCTION

In the beginning there was this: "c:\", and it was hard. But there was an answer, and it came from.....Xerox, yes Xerox. And one day Steve Jobs came to Xerox and said, "This is great". So Steve went back to Apple and said, let there be Lisa (allegedly his young daughter out of wedlock). And Apple labored for three years and then (without Steve, who was now raising a pirate flag over at the Macintosh Group) there was Lisa. And Lisa was cool, like no other computer ever made, before or since. But Apple lost heart and Lisa was discontinued. This hurt many people (especially those with vision and a wallet \$10,000 lighter). But Lisa lives for those dedicated users. This book is dedicated to them.

My wife asked me why I wrote this book. She also asked me why I bought a Lisa. After all, it was nine years old, weighed over 50 pounds and besides, what was wrong with my 386 PC clone. I told her how I fell in love with the first Lisa I saw 8 years ago, and how I always wanted. After successions of Macs (512, 512Ke, Plus, 2 SEs, a II, and an SI) and then a variety of IBM clones (in addition to my profession as an attorney, I administer an eighteen node pc network so I needed a pc at home to stay up on the latest pc software as well as to master the intricacies of DOS), I had all but given up on my dream of a Lisa when one day on America Online I had the opportunity to acquire a Lisa 2/10.

When I made a deal to buy her I went looking for as much information on the Lisa that I could find. Unfortunately, I couldn't find much information. No books were available on the Lisa, and the Macintosh books offered little, if any information. This book is the compilation of my efforts. Once I had gathered this information, I felt that I should share this with other Lisa users. I hope you find this information useful, and I am always looking to add to the book, so send your contributions to Michael Posner, 5170 Woodruff Lane, Palm Beach Gardens, Florida 33418

June 17, 1985

Dear Macintosh™ XL or Lisa^(r) computer owner,

Apple Computer announced several months ago that it will phase-out production of the Macintosh XL (formerly Lisa) computer this Spring prior to introducing an external hard disk drive for Macintosh in the Fall. This letter discusses what to expect from Apple in the future and how your computer will be supported.

First, you should realize that you now own the most powerful Macintosh workstation Apple has ever sold. Your machine can run Macintosh software in up to 2 MB of memory, on a large 12" screen, with the performance and capacity of a hard disk drive. The Macintosh XL and Lisa computers will run all of the major Macintosh business software, including products available from Microsoft and Lotus.

Second, Apple will continue to service and support your computer, through various authorized Apple dealers, for at least the next five years.

Third, today Apple is furnishing you with MacWorks™ XL. MacWorks is the Macintosh operating system for the Macintosh XL and all Lisa computers. It allows Macintosh software to take advantage of up to 2 MB of memory, the 12" screen, and a hard disk. MacWorks also lets you work in the Macintosh Office with the AppleTalk™ Personal Network and the LaserWriter™ printer.

Fourth, Apple will make available for your purchase the following new products also designed specifically for the Macintosh XL:

- XL Screen Kit. The XL Screen Kit can be installed by your authorized Apple dealer to adjust a Lisa or Macintosh XL screen to Macintosh resolution (commonly called "square dots"). The screen will be available this summer.
- Migration Kits. Apple is working with Lotus and Microsoft to develop programs to convert data from Lisa 7/7 to Macintosh applications. These Migration Kits will be available this summer.

Fifth, you should know that AST Research markets the RamStak™ memory boards which allow Macintosh XL and Lisa computers to use up to 2 MB of memory.

Sixth, as Apple continues to develop new workstations, they will be based on the Macintosh software architecture. Thus, through owning a Lisa or Macintosh XL, you will be able to take advantage of many new products in the future.

In summary, you own an extremely useful and powerful computer. Thanks for your business. We hope that you continue to enjoy your Apple product. Please consult your authorized Apple dealer for more information about the products mentioned here when they become available.

Apple Computer, Inc.

Apple, Lisa, and AppleTalk are trademarks of, and Macintosh is a trademark licensed to Apple Computer, Inc. Lotus and Jazz are trademarks of Lotus Development Corporation. Microsoft and Multiplan are registered trademarks of Microsoft Corporation. RamStak is a trademark of AST Research, Inc.

CHAPTER ONE

HISTORY OF LISA

Guy Kawasaki was formerly a software evangelist at Apple, and his book, *The Macintosh Way* is a well written guide to "The Art of Guerrilla Management". His sharp sense of humor makes the book a must read. He described the Lisa as follows:

"A Lisa is a computer that was sold by Apple from 1983 to 1985. It represented much of the technology that eventually appeared in Macintosh, such as a one-button mouse, graphic user interface (pull-down menus, windows, desktop metaphor) bitmapped graphics, and integrated applications. In January, 1985, Lisa became a "Macintosh XL." XL stood for "Extra Large," "Extra Late," or "Extra Lisas" (in inventory). After the inventory was depleted and write-downs were avoided, it was discontinued in April, 1985."

When the Lisa was first introduced the announcement was so important that many major magazines covered the announcement. These included Fortune, Business Week, Time, Newsweek and more. Here are some of those articles, sort of a trip down memory lane.

Business Week

Apple takes on its biggest test yet

If the computer industry were a circus, Apple Computer, Inc. would be a high-wire acrobat performing without a net. Against the odds, the personal computer pioneer founded in 1977 by Stephen P. Jobs and Stephen G. Wozniak -- then a couple of quasi hippies in their early 20s -- has so far been a brilliant success. But voracious competition, particularly from International Business Machines Corp., has taken ever larger bites out of Apple's market share.

Now, in the riskiest phase yet of its brief history, Apple is going for broke to recapture its early lead. Amid much fanfare, the Cupertino (Calif.) company announced on January 19 a new \$10,000 machine, called Lisa, that is designed primarily for computer illiterate professionals, managers and administrators in large corporations. "We're really banking everything on Lisa's revolutionary technology" acknowledges chairman Jobs, now 27. "If Lisa fails," he quips "we'll be just another half-billion or billion dollar computer company."

Apple's success to date has been unquestionably spectacular. From a two person operation in Job's garage, it has grown into a multinational corporation with 3,391 employees. And in its latest fiscal year, ended Sept. 24, sales soared 74% to 583 million while net income rose a striking 55% to 61 million. Nonetheless, IBM has won a 19% share of the \$1.3 billion U.S. market for personal computers priced at \$1,000 to \$5,000 since the company entered a mere year and half ago. And it could take even more with an upgraded

version of its Personal Computer, expected out next month, and later a less expensive model dubbed "Peanut." In just the last year Apple's share of market sales has slipped from 29% to 24% according to market researcher Dataquest, Inc.

Mantle of leadership. To regain its balance, Apple is groping its way into a corporate market in which it has almost no direct experience. What is more, the market is already overcrowded with the giants of the U.S. computer and office-equipment industries, including IBM, Digital Equipment and Xerox.

Perhaps even more important, with Lisa, Apple is also taking on the mantle of personal computer industry technology leader. "Frankly, technology leadership is Apple's only option," explains Fred M. Gibbons, president of Software Publishing Corp., a leading microcomputer software supplier. "It can't outmarket IBM, and unlike IBM, it can't get away with me-too technology." Lisa's novel computer-programming techniques make the machine so easy to use that novices can learn to run it in as little as half an hour. Typically, it takes more than 20 hours to learn to use to-day's Apple II personal computer--the most widely used machine in its class with some 600,000 units sold. "Apple is really the only company that is significantly advancing personal computer technology today," says Gibbons.

This is a brand-new role for Apple. The company has largely been built on sales of its first computer the Apple II, whose success is generally attributed less to technical wizardry than to clever packaging, merchandising and publicity. "The company did a great job defining a new computer market for 'personal' computers with the Apple II," notes Ralph A. Gilman, computer industry analyst at InfoCorp, a Cupertino-based market research firm.

E.T. is coming. Now, Apple is hyping the virtues of Lisa's computing for the computer-naive technology will compensate for what the company lacks in marketing savvy in the unfamiliar corporate course it is charting. "With Lisa's technology we have set the direction for the computer industry for the next 5 to 10 years," says a confident Jobs. Within five years, he claims, every computer sold by Apple will incorporate this technology. The first such Lisa spinoff, planned for introduction after this year, is a \$2,000 machine called Macintosh, or Mac for short. And rumor has it that the next may be a product code-named "E.T." for the home market.

For Apple to succeed and recoup the \$50 million it is estimated to have plowed into developing Lisa and Macintosh, however, it must over the next year answer the many questions industry observers have about its product and corporate strategies.

*Is there a large enough market for easy-to-use computers such as Lisa, that have a \$10,000 price tag? "Obviously there is some market," says Jon Shirley, vice-president of the Computer Div. at Tandy Corp., an Apple rival. "How large it is pretty questionable."

* Does Apple have enough of a technological lead to ensure that imitators do not grab its market?

* Can Apple, relying partly on a tiny sales force and mainly on a network of independent

computer dealers, succeed in selling computers to large corporations accustomed to buying machines from what one dealer calls “well-oiled computer-company salesman in pin-striped suits?”

*Can Apple get independent dealers and software writers to support Lisa?

*Does Apple’s product strategy make sense? Many observers fear that Macintosh, the inexpensive application of Lisa’s technology, will steal Lisa’s thunder--and its market. They also worry that both of these products might damage the markets for the Apple II, and III, on which Apple is counting for the bulk of its revenues until mid-1984. “This is Apple’s first experience being a multiple-product line company,” says Portia J. Isaacson, president of Future Computing Inc., a Richardson (Tex.) market research firm.

*Finally, are Apple’s youthful managers perceived to have grown up enough so that potential corporate customers feel they can do business with them? Recounts John D. Couch, 36, who spearheaded the Lisa project. “One large customer recently confessed that he came in here expecting to find a lot of 26 year olds wandering around in Levi’s with money falling out of their pockets.”

One indication of how uncertain Apple’s prospects are in that expert estimates of how many Lisas the company will sell this year are all over the lot--from 2,000 to 30,000. Apple will not disclose its own internal sales forecast, although Jobs says, “I don’t think we will have any trouble selling all the Lisas we can build.” However, Apple president and chief executive, A.C. “Mike” Markula, Jr., concedes: “It’s going to take time to get the message of what Lisa’s all about across.”

Multiple tasks. Infocorp’s Gilman estimates that the easy to use computer that inspired Lisa’s development--the two year old Xerox “Star”-- has had total sales of only 2,400 units so far. But the Star has only some of Lisa’s features and initially costs customers \$50,000, or five times as much as Lisa, he points out. Nevertheless, “because Apple is changing its product and its customer base with Lisa, I would expect it to get off to a slow start,” predicts E. David Crockett, a computer industry analyst at Dataquest, Inc.

The size of the market is uncertain, because Lisa is so novel. Until now the user has had to sit at the computer keyboard and type in arcane and often hard-to-remember commands to make his computer work. Every time he wanted to change from one job to another, he had to change program disks. And information he typed into one program had to be typed in again if he needed to use it in another program.

With Lisa though, the user has to touch the keyboard only to feed in data, not to get the machine to work. Using a handheld device called a “mouse” that controls an arrow on the screen, the user simply points to the command he wants and activates it by pushing a button on the mouse. Lisa’s special software also lets it do many jobs at once--such as calculating figures and then drawing a graph of the results.

Bet your company? “People use the word ‘revolutionary’ all the time, but this is the first thing I’ve seen that justifies the use of that word,” says Kenneth T. Lim, a computer industry

analyst at Dataquest. However, Lisa also has shortcomings. One complaint from experts is that it is somewhat slow in retrieving information from its memory. "Yes, it is a bit slow today," concedes Couch, who now heads the Office Products Div. that Apple has built around Lisa. "But we will be speeding it up over time."

Some industry experts are disturbed by the new technology's pivotal role in Apple's future. Cautions consultant Isaacson: "Although I think Lisa is a breakthrough product, I'm not sure Apple should be playing bet-your-company with it."

One danger is that the corporate customers expected to account for the bulk of Lisa's sales seem to be in no hurry to buy. Granted, Apple has been swamped with requests from companies to be chosen as Lisa test sites, and those that have been running such pilots have been enthusiastic. "I was impressed and really excited," declares Dana "Rick" Richardson, national director of computer auditing and national director of microtechnology at Arthur Young & Co. The New York-based accounting firm intends to move quickly. "We plan to be aggressive with this new technology and to purchase some [Lisa] units."

No frenzy. But most potential corporate customers are being far more cautious. "I personally like Lisa," says Gerald L. Brody, chairman of the year old personal work station task force at Standard Oil Co. of California, which has been running a test pilot. But, he notes, "there is no frenzy to go to personal computers in our company. We may decide that this generation of machines is not the one we want for everyone's desk." Adds Don D. Smith Jr., a consultant for Atlantic Richfield Co.'s Corporate Units Information Services Group: "We already have many big computers and terminals, and like most big companies, we are moving cautiously rather than springing ahead to invest in small computers."

Burgeoning competition may also contribute to a slow start for Lisa. Over the next few months, several software companies are expected to introduce programs that will provide various personal computers--including the IBM Personal Computer, Apple archival--with many of Lisa's easy-to-use features. "Whereas Lisa's software can only run on the Lisa machine [our program] is going to run on scores of machines," says Daniel H. Fylstra, chairman of VisiCorp, which last December previewed VisiOn, a software package that offers some of Lisa's features.

Apple must also recruit independent software companies to write new software for Lisa. Their programs, which can be added to six others already built into Lisa, are vital because computer buyers generally chose machines that offer the largest variety of applications. The danger for Apple is that independents may decide they would be better off spending time developing software that can run on many machines instead of on Lisa.

Dealer discontent. Apple's unorthodox plan for selling, supporting and servicing Lisa seems unlikely to encourage customers to rush out and buy, however. A 100-member sales force of Lisa "account executives" will be ready by April, when Apple starts shipping Lisa in volume. It will sell the machines to large companies and coordinate the management of an account on its various sites. "The sales agreement will be between Apple and the big company," explains Barry H. Smith, Lisa's product marketing manager.

But, explains Smith, “the different branches of the company will place their orders with their local Apple dealers.” For service and support the customer will be able to choose between the local dealer—who will be authorized to sell Lisa—if he can meet certain requirements—or RCA Corp., with which Apple has entered into a service agreement.

The plan does not thrill large companies. “We don’t want to have to go through dealers,” says Standard Oil’s Brody, echoing the sentiments of some other target customers. “Our experience has shown that we have more leverage and get better service when we deal directly with manufacturers.”

Scary Price Point. Some dealers are equally unenthusiastic because they worry that the machines are too expensive for their typical customer. “I’m scared to death of a \$10,000 price point for a product,” says Warren Winger, chairman of CompuShop Inc., a Richardson-based chain of dealerships.

There are at least two reasons why Apple is eager to stay with its dealer network rather than create a direct sales force of its own, an option it does not rule out. For one, dealers account for almost all purchases of the company’s bread-and-butter products—the Apple II and III—as well as the upgraded Apple IIe, also announced on Jan. 19. “Apple has to balance dealer loyalty—which it needs to sell its present product line—against its need to sell to large companies,” explains InfoCorp’s Gilman. Lisa marketing manager Smith offers the other reason: “While we see the 500 [largest industrial companies] as being the key market for Lisa, we may be most successful selling it to medium and small companies that our existing dealer base reaches very effectively.”

However, a portion of this dealer base—particularly the full-service dealers who provide extensive support for Apple’s products—is acutely unhappy with Apple right now. Last summer Apple began to encourage heavy discounting to maintain its competitiveness with IBM and to sell old Apple IIs before the new model IIes arrived. As a result, the retail price of a typical Apple II with peripheral devices has dropped from \$2,500 to \$2,000, and dealers’ margins are estimated to have been halved.

The Mac strategy. Apple hopes to keep dealers in line with the prospect of selling not only Lisa but, better still, Macintosh. With its target price of \$2,000, Macintosh is more akin to the products the dealers have been handling. A seasoned industry analyst deeply impressed by a preview of Macintosh says, “the future of Apple is going to be Macintosh, not Lisa.” Adds the ebullient Jobs: “When it comes out, Mac is going to be the most incredible computer in the world—another Apple II.”

Apple executives are closed-mouthed about Macintosh. However, sources close to the company say Macintosh, like the Apple II, is intended as a general purpose machine for everybody: “It’s for people who work at home, students, teachers, etc.” Borrowing the Lisa’s features, Macintosh—unlike the Apple II—will be able to serve people who know nothing about computers, insiders say.

Apple critics chide the company for poor strategic planning in announcing Macintosh and Lisa in the same year, thereby confusing customers and possibly spoiling the market for

Lisa. Other critics are disturbed because Macintosh and Lisa are “incompatible,” which in the industry’s jargon means that the two will not run the same computer programs. “It’s a serious flaw in the strategy,” says InfoCorp’s Gilman. “Customers like to start with an inexpensive machine and then upgrade it with a more expensive version.” Such compatibility is a cherished precept of the computer industry.

But Jobs counters “You can’t have a revolution when you are tied to the anchor of your own history.” Macintosh is priced lower, he says, “because hardware innovations make it less expensive. But while the machines are incompatible anyone who can use one of them can also use the other. According to sources close to Apple, Macintosh is priced lower also because it will initially run only a few fixed programs, including word processing and financial modeling. Lisa, by contrast, with its six basic applications programs, can be infinitely expanded.

Power struggles. As Apple insiders tell it, the incompatibility of the two machines results not just from the demands of innovation but also from internecine rivalry that followed the company’s split into product divisions in 1980. Although Apple will not officially confirm the details, sources say that Jobs wanted to run the Lisa division but that Michael M. Scott, Apple’s president at the time, told him he lacked the necessary experience and gave the job to Couch. “Steve was furious and went off and started the Mac project,” says an insider. “He was determined to prove that Mac could be a bigger success.”

For Macintosh and Lisa to be compatible, Jobs would have had to let the Macintosh project fall under the Lisa division’s control. Jobs won the power struggle: The Lisa division lost. He now concedes, “I am paying extra special attention to this one [Macintosh] myself.”

Despite such maneuvers, however, there are some indications that “the management is becoming more seasoned,” says John McKay, an analyst at Kidder, Peabody & Co. Earlier this month, Apple hired its first-ever vice-president for marketing, 45 year old E. Floyd Kvamme, who has broad experience in the semiconductor, consumer electronics, and computer industries. Until then, marketing was one of Markkula’s many responsibilities. Kvamme is expected to concentrate on tackling Apple’s distribution problems and to rationalize the three product divisions marketing strategies so they do not collide.

‘Eccentric passion.’ Fortunately for Apple, 40-year-old Markkula, who has indicated for about two years that he would like to retire as president--“if we can find a person we think can do a better job than me”--shows no signs of carrying out that plan. Dataquest’s Crockett, expressing the view of many observers, says: “I would view it as a negative for the company if he were to leave. He has contributed balance to Apple.” Markkula’s pragmatic and wryly humorous approach is seen as an essential counterweight to Job’s creative temperament and sometimes arrogant demeanor.

Yet Job’s qualities, which engender a certain nervousness in the financial community are to some degree mirrored in Apple’s corporate culture and make the company attractive to bright young engineers and business school graduates. “Apple is seen as a dynamic and creative place to work, where you get a chance to make a contribution,” says project manager Kristen A. Olson, who joined Apple after she got her MBA in 1981.

Jobs himself characterizes the Apple corporate culture as one in which “we have what you might call an eccentric passion for what we are doing.” Enthusiastic of that order is certainly essential to Apple to meet the enormous challenges it faces over the next two years. Its struggles will be closely watched by friends and foes alike. “Apple is such a darling little story that I hope it succeeds,” says Future Computing’s Isaacson. “But there are also a lot of people out there waiting to give the company a good kick if it fails.”

The New Girl In Town
Newsweek January 31, 1983
William D. Marbach

In a \$50 million gamble, Apple stakes its future
on Lisa--a remarkably friendly personal computer.

Like a magician readying his best trick, Steve Jobs waited for the house lights to dim and the crowd to quiet down. A spotlight focused on a table where a bulky shape lay hidden beneath a bluff-colored cloth. “The personal computer was created by a hardware revolution of the 1970’s,” Jobs, the 27-year-old multimillionaire chairman and co-founder of Apple Computer, told 1,200 Apple stockholders gathered last week in Cupertino, Calif. “The next dramatic change will come from a software revolution...which Apple is introducing here today.” On cue, the cloth was lifted--revealing Lisa, a new \$10,000 computer and a \$50 million gamble for Apple.

Apple’s long-awaited Lisa computer, in development for more than three years, will be the first of a powerful new generation of personal computers--machines that will make computing accessible to even the greenest novices with only hours of preparation. Lisa draws on an ancient principle: that a picture is worth a thousands words--in this case pictorial images on the screen are easier to learn and use than mind numbing strings of computer commands. To make the machine attractive to even the most computer-illiterate users, Apple built a unique combination of powerful hardware and sophisticated software. “Lisa is a revolutionary idea and a revolutionary product,” says Los Altos, Calif., computer consultant Jean Yates.

While Lisa is unquestionably a remarkable technological achievement, it also represents a huge risk for Apple. With its \$9,995 price tag, Lisa must do battle in what has become a ferociously competitive market in personal computers. Since IBM introduced its Personal Computer in August 1981, Apple’s share of the market has declined from 29 percent to just 24 percent, while IBM holds 19 percent. And IBM is conceding nothing to Apple: last week the computer giant announced that it would begin selling PC model overseas and IBM is also reported to be readying several new entries in the personal-computer market. Moreover, Apple faces assault from a different direction--independent software companies. In November, VisiCorp, which markets the phenomenally successful VisiCalc electronic spreadsheet program unveiled a new software package dubbed VisiOn incorporating many of the same “friendly” features used by Lisa. When it reaches the stores late this summer, VisiOn will sell at a much lower price than Lisa--and will be adapted to many existing machines, including IBM’s PC.

The software revolution heralded by Lisa and VisiOn is largely an outgrowth of brilliant computer research done at Xerox Corps. Palo Alto Research Center (PARC) in the 1970's. Instead of working toward yet more cold and faceless screens, PARC engineers pioneered ways of making computers easy to use. The group created a software programming system called Smalltalk that used a hand-guided "mouse" to bypass some keyboard functions, and added high-resolution "bit mapped" graphics. Xerox itself was slow to bring these innovations to market; in 1981 the Xerox 8010 Star "executive work station," an outgrowth of the Smalltalk project, made its debut, but the cost was high (a minimum of \$16,000) and performance was limited. The Star has not sold well, but the ideas it embodies have. "Whether or not the Star has been a success--and no matter what happens to Xerox as a company," says Dan Bricklin, chairman of Software Arts and inventor of VisiCalc, "their research at PARC is a national resource."

Trade-off: In 1979, when Apple set out to top the stunning success of its Apple II model by building more powerful computer, Steve Jobs and software engineer John Couch took a tour of Xerox's PARC. They brought back the ideas they needed--and hired the Xerox engineer who had given them the tour; eventually more than 15 Xerox engineers joined Apple's Lisa project. Lisa was designed to use one of the most powerful microprocessors on the market today, the Motorola 68000, and after Motorola brings out the 68020 chip later this year, Lisa could become a full '32 bit computer more powerful than many minicomputers. Computer designers who want to make their machines very easy to use, however, make a trade-off; graphics-oriented software like Lisa and VisiOn requires vast amounts of computer memory and fast processors--and makes the systems more costly. Lisa uses 2 million characters of memory for its own operations; Apple II, by contrast, is limited to about 49,000.

The extra horsepower and huge memory do payoff; while it takes days to learn how to use most personal computers and their key software programs, it takes only a few hours to learn most of Lisa's tricks. Instead of typing a sequence of commands on the computer keyboard, the user merely points to tiny "icons" or commands on the screen by sliding the "mouse" (a plastic control box the size of a cigarette pack) on the desktop beside the computer. As the mouse rolls, an arrow called a cursor moves across the screen. To erase obsolete information for example, the user moves the mouse to point first at whatever is to be thrown away, and then at an icon in the shape of a tiny trash can; at the press of a button on the mouse, the information vanishes. Apple took pains to create the illusion of an electronic desktop on the screen: memos, charts, clipboards, file folders and other paraphernalia can be shuffled around on the screen just as on the surface of a desk.

Options. More important, Lisa follows a trend started at PARC--the software is "integrated" which means users can move data from one program to another without having to reprogram the computer. For instance, calculations can be lifted from the spreadsheet, turned into a pie chart or bar graph, then popped into a memo--all with a few quick skating motions with the mouse. Lisa will be sold with six applications tools: a word processing program, a "Lisa-Calc" spreadsheet, a graphics program, a data-management system, a scheduling tool for managing complex projects and "Lisa Draw," a unique program that allows the user to draw standard shapes--circles, squares and the like--or even draw freestyle.

Apple designed Lisa as a free-standing personal computer, but it also can be hooked up to other Lisas and some larger minicomputers. And Apple plans to introduce equipment that will allow Lisa to talk--at high speed--to IBM mainframe computers, an important consideration in the office market Apple wants to capture.

With Lisa, Apple is following the same strategy that helped account for the phenomenal success of the Apple II and played a key role in the explosive growth of the personal-computer market: the company is encouraging independent software companies to develop software applications for the new machine. Apple will offer an optional operating system (the "traffic cop" inside the machine that controls its functions) for Lisa, which means that much of the software designed for many minicomputers will be able to run on Lisa.

How will Lisa fare in the marketplace? "I think it's terrific--there's no question that it is far-reaching software technology," says analyst Adam Cuhney of Salomon Brothers. "The only thing that has people concerned is the price." Some businessmen profess not to worry; in fact they plan to substitute the powerful Lisa for minicomputers costing five times as much. Still, after the disastrous introduction of the Apple III two years ago--14,000 had to be recalled for re-tooling--the company is taking no chances. Hundreds are being shipped out to test sites around the country, and for months Apple has been offering sneak previews to major corporate customers.

Features: While Lisa itself does not have to be a best seller, Apple has staked the company on Lisa technology. Later this year Apple is expected to introduce another new personal computer, the Macintosh. It is said to incorporate some features used on the Lisa (including the Motorola microprocessor) and sell for a much lower price--probably around \$2,000. Jobs personally heads the Macintosh development team, and there is some question whether marketing Macintosh will bring it into competition with Lisa. (In the intricate world of Apple corporate politics, former president Michael Scott reportedly refused to let chairman Jobs run the Lisa team because he was too inexperienced; Jobs went off to start work on Macintosh--and Scott eventually left the company.)

Until Lisa, Macintosh and other new machines begin paying off, Apple will rely on the venerable Apple II for most of its revenue; last week the company introduced an enhanced version of the machine that brought Apple from a garage-shop company to a \$583 million firm in only six years. But today the Apple II is under fierce attack from all sides. The most formidable competitor, IBM, is readying a powerful new 16-bit machine, code named "Peanut," that may sell for less than \$1,000, below the 8-bit Apple II price. IBM is reportedly developing an executive work station ("popcorn") that may take Lisa head-on. The magicians who head Apple sound confident--even though the stakes are higher than ever. But win or lose the age of "friendly" computing has begun.

Time
The Year of the Mouse

January 31, 1983
by Philip Faflick

Apple's long-awaited Lisa ushers in a new era of easy computing.

It actually looks a bit like a mouse, with its rounded corners, off-white color and thin wire tail. The size of a pack of cigarettes, it fits snugly into the palm of the hand. Slide it across a table and electric signals go down its 2-ft. tail. Plug that tail into a computer and the mouse directs the movement of a pointer on a video screen. The result: a device that can bypass the thicket of codes, commands and complicated keyboards that have plagued users since the computer era began.

Last week Apple Computer Inc., the company that made itself a household word by making computing power affordable to individuals, unveiled a mouse-controlled computer named Lisa that may change forever the way people communicate with their machines. Says Wall Street Analyst Ulric Well, author of *Information Systems in the Eighties*: "Simply put, Lisa ushers in the second generation of personal computers."

Priced at \$9,995, the machine packs into a box, 50-lb. package most of the hardware advances of the past five years: a system that will store nearly 7 million words; a sophisticated "32-bit" microprocessor that is far more powerful than the eight-bit chip in its predecessor, the Apple II and an ultrasharp video display that can show twice as much detail as a standard computer screen. But the key breakthrough is embodied in Lisa's software, the computer code that makes the machine much easier to operate than any other desktop computer. The operator simply takes the mouse in hand, and a little black arrow springs to life on the screen. That arrow can be directed toward the postage stamp size pictures lining the bottom of the screen. These are Lisa's "icons" graphic symbols representing such everyday objects as a trash can, a clipboard, file folders, a calculator, a battery operated clock. By pointing an arrow at an icon and pressing the button on the mouse, the user triggers an action. He might use the trash can to discard the first draft of a memo. The clipboard is used as a temporary storage when moving information from one place to another. File folders are for long term storage.

The mouse can also conjure up any of six business programs that come packaged with the computer: word processing, economic modeling, graphing, list management, project scheduling and free-form drawing. The user can run several programs at once, just as an office worker can spread several jobs across a single desktop. Creating and editing files, running printers and other peripheral devices, and juggling long lists of numbers can be done without consulting a manual or remembering a single computer command. Explains John Couch, Apple's vice president in charge of the Lisa project: "What we wanted to do was emulate the way an individual works in an office."

Apple is aiming Lisa at the nation's 30 million professionals, managers and administrative executives. Much is riding on the success of the machine, both for Apple, which invested

\$50 million and three years in the project, and for its hard driven, high-strung chairman, Steven Jobs. At the official unveiling of the new computer last week, Jobs was able to announce to his stockholders a 73% increase in quarterly profits on sales of \$214 million. That increase was due almost entirely to the continued high sales of the durable Apple II (750,000 sold since its introduction six years ago; 45,000 in the month of December at its all time-low list price of \$1,330), a machine that is showing its age. The company discontinued manufacture of the Apple II last week and introduced an enhanced version called the Apple IIe, priced at \$1,395, which its assembly plant in Carrollton, Texas is turning out at the rate of one every 30 seconds. (The original Apple was a short-lived machine aimed at hobbyists, and only 600 were built). The firm's other computer, the Apple III, never quite caught on. It suffered a disastrous launching (the first 14,000 had to be recalled for retooling) and then was outsold by International Business Machines belated entry into the desktop market, the IBM Personal Computer.

Apple, setting out to prove that it could build a better personal computer than IBM or anyone else, seems to have made its point with Lisa. The new machine has some flaws: no color, a balky printer, a sluggish word processor, a few trick hurdles in a new planning and scheduling program. But nothing on the market, including the IBM PC, compares with the new machine. Lisa pays imaginative court to details: when a knotty task is in progress, the machine signals that the ensuing work will take some time by displaying a little hourglass. When the "off" button is pushed before work on the screen has been properly stored, the machine automatically files loose documents and stows away relevant data before shutting itself off. Headlines and labels can be set off in any of a dozen typefaces then enlarged or shrunk with a flick of the mouse. Moreover, nearly all the built-in software is "integrated" that is, numbers, words and pictures can be easily transferred among the charts, graphs, memos and computations on the screen. Several companies offer software that is more or less integrated, but none matches the ease of use of Lisa and its mouse.

Lisa, of course, did not spring full blown from the mind of Jobs. Primitive hand controllers have been used with computers for nearly two decades, ever since Stanford Research Institute Scientist Douglas Engelbart built a scurrying table-top gadget in the mid-'60s nicknamed "the mouse". In the early 1970s researchers at Xerox began improving on Engelbart's design, and soon after, computer experts at the company's Palo Alto research center began using a mouse in a computer language they called Smalltalk. By pointing and pressing buttons, they could send messages to and from objects on a screen without using a keyboard. In December 1979, Jobs and a group of Apple engineers visited Palo Alto for a demonstration of the Smalltalk system. They watched the electronic rodent point at commands while a Xerox researcher, Larry Tesler, made a case for the hand-held device. Recalls Bruce Daniels, a Lisa designer who saw the presentation: "We loved it, what they were trying to put across in terms of ease of use. We all said "That's it. That's what we want to build." Six months later, Tesler joined Apple and the Lisa Team.

At Apple, the Lisa project began to build. First there were rambling late-night sessions between Jobs and Couch, then the installation of a 40 man team in quarters behind the Good Earth health-food restaurant in Cupertino, Calif., and finally in 1982, the establishment of a 400-man force in three one story beige and red-tile buildings near Apple's antiseptic headquarters in Cupertino. Couch fired up his workers with what he calls

the “Outward Bound school of business,” stressing the virtues of originality and sweat. New workers were employed as pristine users and psychologists tested new features for what the industry calls “user friendliness.” The result now appear to be very friendly. Apple says its studies show that a novice can learn to operate Lisa in 20 to 40 min., as opposed to the 20 to 40 hrs. of instruction usually needed to master a first-generation computer.

Apple hopes that Lisa will go a long way toward opening up the consumers. “It’s definitely the way things are moving,” says Gary Kildall, the inventor of the popular CP/M operating system that runs many small computers and one of more than 28 independent programmers who are writing additional software for the Lisa. Paul Freiberger, a senior editor of the trade weekly InfoWorld, agrees. “I was blown away,” he says. “they are a year ahead of everybody.”

Innovation, however, is not always a key to success in the marketplace, especially the mart for a \$10,000 machine. “There’s a lot more to selling equipment to major corporations than knocking on the door and taking orders,” says Charles Hoerner of Foremost McKesson, who is shopping for computer system for the San Francisco-based conglomerate. “There are lots of organizations that have an IBM bias. They are not particularly open minded.” Says Barry Smith, Lisa’s marketing manager: “Corporate life does not reward risk takers, and there’s the old adage that you never lose your job buying an IBM.”

Although IBM does not offer a machine that compares with Lisa, that gap could be filled at any time. “I’d expect direct competition to Lisa before the end of the year,” says Clive Smith of the Yankee group, a Boston based consulting firm. Already one company, VisiCorp, has announced that it is developing a mouse system that will plug into an IBM PC and give it some of Lisa’s capabilities at a lower price. Apple itself is working on a scaled-down version of Lisa called Mackintosh (sic), (a misspelling of the McIntosh apple). Priced at about \$2,000, it is expected to make its debut this summer. Other mouse-driven machines are sure to follow, but Jobs shrugs them off. “We want to drive this industry,” he says. “We could have introduced Lisa a year ago, but we wanted to make it perfect. We’re prepared to live with Lisa for the next ten years.”

Macworld
May/June 1984
State of the Art: Systems
THE LISA CONNECTION
by Lon Poole

Apple Computer faced a real problem: what to do with its flagship, the Lisa, when it introduced the Macintosh. The Lisa was a trendsetter, but an expensive one. Launched with fanfare in January 1983, the Lisa was the first microcomputer to have a mouse-controlled pointer, windows, multitasking, and cut-and-paste integration of application software. Its five figure price tag made it a luxury liner, chiefly for corporate accounts and certainly not for plain folks. The Mac would contain most of the Lisa’s style and at least two-thirds of its power at one-fourth of the Lisa’s original \$10,000 price. Apple had already cut the Lisa’s price once in the face of lackluster sales; further reduction might be

misconstrued as a fire sale.

The Lisa was foundering all on its own, but every fresh Mac rumor seemed a salvo aimed at the Lisa's weakening hull. It began to look as if the Mac would sink the Lisa before the Lisa's first birthday. The intramural rivalry was just as real inside Apple, where the Mac team, housed across the street from the Lisa team, hoisted a skull-and-crossbones flag over its building. How to save the Lisa from an ignominious end? Apple's answer: make the Lisa and the Mac allies, not enemies. Promote their many similarities and minimize their differences. Eliminate the major disparity the disk drives-by substituting a Macintosh-style drive for the Lisa's twin nonstandard drives. Give the Lisa the ability to run Mac software. At the same time retool the Lisa's software to run two or three times faster. And instead of insisting that people buy a maindeck Lisa or none at all, let them choose from among a lower deck, a main deck, or a promenade deck. Furthermore, let them start with a lower-deck Lisa and move up later.

The result of this detente between the Lisa and the Mac is the four-member Apple 32 SuperMicro family (see "Macintosh and Lisa 2 Specifications"). All four models feature a very high resolution black-and white screen, a mouse, a single 3 1/2-inch microdisk drive, the same arrangement of keys on the keyboard, and the MC68000 16/32-bit microprocessor. At \$2495 the Mac has the lowest price; its small size and light weight make it fully transportable. The Lisa models range in price from \$3495 to \$5495. They are more than twice the size and weight of the Mac, have larger screens (12 inches vs. 9 inches, diagonally and more memory (512K vs. 192K) (sic), and can be expanded with additional memory and hard disk drives. (In the near future, a hard disk and other peripherals will be available as Mac add-ons.) All the new Lisa models can run Mac software.

The Lisa 2 (\$3495) is essentially a bigger, more powerful, expandable Mac. Its larger memory (512K) accommodates larger spreadsheets and word processing documents, and its larger screen lets you see more of those documents at once. Its expandability enables it to grow along with your needs.

The Lisa 2/5 (\$4495) adds a 5-megabyte external hard disk to the Lisa 2, making it most like the original Lisa. It can run many applications created by independent developers for UNIX-like operating systems. By adding more memory, you can use the Lisa Office System, with its simultaneous operation of multiple Lisa applications in the Lisa Desktop Environment.

The Lisa 2/10 (\$5495) gives you everything the 2/5 has and twice as much hard disk space, built into the cabinet rather than housed externally.

Lisa-Mac

To use Mac software such as MacPaint, MacWrite, or Multiplan on the Lisa, you must first start the Mac desktop environment. Right now, that procedure is accomplished by inserting a special disk MacWorks (Apple may change that name) and switching on the Lisa. If your Lisa 2 has a hard disk, you must listen carefully for a click from the speaker, then simultaneously press-the Apple key (same as the Mac "Command" key) and the 2 key.

Pressing those two keys tells the Lisa to start from the microdisk, not the hard disk. Although Mac software can presently support only 3 1/2 inch micro-floppy disks, plans are underway to give it access to the hard disk by summer.

The Lisa goes through several seconds of self-tests and then begins to copy information from the MacWorks disk into memory. Since it hasn't the 64K ROM of the Mac, it must copy the equivalent of that ROM from disk into its regular memory each time you start it. The MacWorks disk comes with the Lisa 2 but costs \$195 extra with the Lisa 2/5 and 2/10.

After about 5 seconds, the Lisa ejects the MacWorks disk and displays the same disk icon with a flashing question mark that you usually see when you first switch on a Mac without a disk inserted. From this point on, everything works the same as if you were using a Mac. Insert a Mac system disk or some other start-up disk.

Soon the Mac desktop appears on the Lisa screen. You notice a difference immediately. The disk and trash icons are nearer the center of the screen than the right edge, and everything looks lanky, like a movie shown through a conventional lens.

A Big Desktop

A complete Macscreen image fits on the Lisa screen with room to spare. There are 22 extra dots on the bottom of the screen (about 0.4 inch) and 208 extra dots at the right of the screen (about 2.3 inches). This space is available for larger windows, more icons, wider word processing lines, more spreadsheet columns, and so on. However, not all application programs are designed to take advantage of the extra screen space. Some, like MacPaint have fixed dimension windows, and others, like early versions of Multiplan, do not allow enlarging the window past the dimensions of the screen. Microsoft Chart has been written so that it can take advantage of the Lisa larger screen. The program detects whether it is not on a Lisa and adjusts its display accordingly (including scaling the screen aspect ratio).

The El Greco Effect

Macintosh images measure about 25 percent taller and 14 percent thinner on the Lisa, making squares look like rectangles and circles look like ovals. Although text is distorted in the same way as graphics, the difference is not as noticeable.

This distortion is due to different dot (pixel) shapes of the Mac and Lisa screens. The Mac has square dots, and the Lisa has rectangular dots. A full screen image on the Mac, which comprises 512 dots across and 342 dots down, occupies exactly the same number of dots across and down when drawn on the Lisa screen. Although the number of dots is the same on either screen, the distance covered is not. Because the Mac packs more dots per inch down the screen, the 342 dots that take about 4.75 vertical inches on the Mac screen take about 5.9 inches on the Lisa screen. And because the Mac fits fewer dots per inches across the screen, the 512 dots that take about 7.1 inches across the Mac screen take only about 6.1 inches across the Lisa screen.

Without a doubt MacPaint suffers most from this distortion. Every drawing you create on

the Mac and later view on the Lisa looks elongated, as if El Greco had redrawn it. Those same drawings will print correctly on the Imagewriter, however, since it has the same proportions as the Mac screen. Conversely, drawings that look correct on the Lisa will look squashed when later displayed on the Mac or printed on the Imagewriter. Unfortunately, the Lisa benefits--its larger screen and memory--do not help MacPaint, with its fixed window and single-size drawing. If you plan to use MacPaint extensively, the Lisa 2 is the wrong machine for you.

Text-oriented applications such as MacWrite and MultiPlan also suffer from this distortion, but not as badly. Text proportions are fixed. Large or small, all text has the same height-to-width ratio, which you cannot change as you can shapes in drawing. It's simply a matter of getting used to the new look. If you need an incentive to do that, think about how many more spreadsheet columns or characters on a printed line you will be able to see at a glance on the larger electronic desktop. Think about the larger spreadsheets and longer reports you can create in the Lisa's extra memory. (At present, not all software takes advantage of these capabilities, but new versions are in the works.)

Bigger Memory and Speed

A typical application program and document will not fit completely in the memory available on a Macintosh. To solve that problem, the computer breaks the program and document segments. At any given time, only some of the segments must reside in memory. The others can be kept temporarily on the disk. As circumstances change (you choose a certain command or move to another part of the document), different segments are needed. The computer copies idle segments from memory to disk and replaces them in memory with other segments that meet your demands. This transferral explains why you hear the disk drive activate in MacPaint when you chose the Show Page command to move a different part of your drawing into view.

Because the Lisa has four times as much memory as the Mac, more program and document segments will fit at the same time. In fact, because many applications can reside entirely in memory, you can avoid having to swap disks. In addition to saving time, the program can be a great deal more efficient. Once in memory, however, Mac software does not seem to execute as quickly on the Lisa as on the Mac. Because this degradation balance out the improvements due to less disk swapping, Mac software performs about the same on either machine.

The Lisa's extra memory is also available for documents larger than the Mac can handle, but applications software must be designed to take advantage of it. MacWrite, for example, can create documents of up to 85 pages on the Lisa, compared to about 20 on the Mac. Multiplan can handle larger, more complex worksheets too. But there is a price. Larger documents take longer to save on disk and longer to open. The longer a MacWrite document the more time it takes to scroll from beginning to end. Multiplan spends more time recalculating a large worksheet than a small one.

The Lisa Office System

Original Lisa users had a choice of application software: the Lisa Office System or nothing

at all. Not a bad choice, since it offered seven applications in an electronic desktop environment and could run all those applications simultaneously: The Lisa Office System survives, though it will not run on any Lisa 2 models out of the box. It requires a hard disk and at least 3/4 megabyte of memory (768K) and it works better with a full megabyte. To any Lisa 2 you must add memory, and to the plain Lisa 2 you must also add a hard disk drive.

People familiar with the Mac desktop environment will find that they know how to use 95 percent of the Lisa Office System desktop environment. The other 5 percent will come naturally. Although some icons on the Lisa have different shapes and titles, they are easy to recognize. For example, the Trash can on the Mac Desktop has its lid on, while the Wastebasket on the Lisa Desktop has its lid ajar.

The Lisa 2 runs Office System software two to three times faster than the original Lisa. The legendary waits for the Lisa to start an application for the first time after being switched on have been trimmed considerably. For example, starting LisaDraw on the original Lisa takes about 50 seconds, while on the Lisa 2 it takes less than 30 seconds. On the original Lisa there was sometimes a noticeable lag when typing text in LisaWrite, the display screen just couldn't seem to keep up with moderate typing speed. That lag, while still perceptible, is no longer onerous.

Users of the Lisa Office System can chose among the original seven applications still available from Apple: LisaWrite (word processing), LisaCalc (financial modeling), LisaDraw (free form presentation graphics), LisaGraph (business graphics), LisaProject (project management), LisaList (list management), and LisaTerminal (terminal emulation). In addition, independent developers have announced more than 20 additional software applications for the Lisa Office System, covering tax and estate planning, relational database management, investment and loan analysis, general accounting, graphic image libraries, legal billing and accounting, personal financial decision assistance, word processing, time management, financial modeling and statistics.

UNIX

Two UNIX operating systems, XENIX by Microsoft and UniPlus by UniPress, add multiuser capability to the Lisa 2/5 and 2/10. The multiuser capability means that the Lisa can act as a host for other computers and terminals, giving users in different locations access to the software, and the data that reside in the host Lisa. However, UNIX is not compatible with the Lisa Office System. It replaces the Lisa desktop environment with a conventional keyboard-command, line-oriented environment which means no mouse, windows, icons or cut and paste integration.

Independent developers have announced more than two dozen software applications for the XENIX environment. Topics include tax preparation, general accounting, relational database management, word processing, financial modeling, accounting for specific kinds of business, and computer programming in COBOL and FORTRAN.

Other independent developers have announced software applications for the UniPlus

environment. They cover relational database management, financial modeling, word processing, and computer programming in FORTRAN, COBOL BASIC, C and Pascal.

The Lisa 2 System Unit

A typical Lisa 2 consists of a system unit, a mouse, and a keyboard. It must also include one or more hard disk drives, a printer, and a modem. The system unit weighs 55 pounds, compared with the Mac's 16.5 pounds. The Lisa 2 system unit houses the display screen, a single 3 1/2-inch microdisk drive, a power supply, video circuitry, four electronic circuit boards, and sockets for four more circuit boards. The keyboard jack and power switch are located on the front, beneath the overhanging disk drive and display screen. Sockets at the rear let you connect the power cord, a mouse, an external video monitor, two serial devices such as a printer and a modem, and (on models 2 and 2/5) an external hard disk drive. Unlike the Mac, the Lisa has no jack for connecting an external speaker or sound system. Two control knobs, one for screen brightness and the other for focus, protrude from the back cover.

Unlike the Mac, the Lisa permits access to its innards for service and upgrades. The face plate snaps off exposing the disk drive chassis. Removing it is a matter of loosening a knurled knob, sliding the chassis out, and disconnecting a couple of cables. Access to the rest of the parts is through the rear and involves unplugging cables from their sockets, loosening two knurled knobs, and lifting of the back panel. Once that is done, you can simply slide out the power supply module, the main computer and memory module, and the expansion slot module. The circuit boards that plug into the main and expansion modules have specially designed fasteners that make removal and installation virtually foolproof. None of this requires tools or special knowledge. Only the video circuitry with its dangerous residual high voltages, disassembly of the disk drive and power supply modules, and components on the circuit boards require the services of a trained technician.

The Mouse

The mouse connects to a special socket at the back of the Lisa. Aside from the style of its plastic case, the shape of its single button and the design of its plug, it is identical to the Mac mouse. The Mac and Lisa mice are interchangeable.

The Keyboard

A lightweight keyboard attaches to the front of the Lisa with a coiled cable. The keyboard stows underneath the protruding screen and disk drive, or it can be placed anywhere within about five feet of the system unit.

Key layout on the Lisa exactly matches the arrangement of keys on the Mac and follows the standard set by Selectric typewriters. Shift keys are large and set where touch-typists expect them to be. The Caps Lock key, located directly above the left shift key, locks in the down position to let you know it's engaged. The Lisa keyboard includes a numeric keypad that has the same key layout as the extra Mac accessory keypad. The Lisa and the Mac keyboards have one cosmetic difference. The key located between the Option key and the

Space Bar, called the command key and labeled with the apple symbol on the Mac keyboards, is called the Apple key and is labeled with an Apple logo on Lisa keyboards.

Users accustomed to other computer keyboards will miss Esc, Control and Alt keys and will wonder at the Option, Apple, and separate Enter and Return keys. Some will feel lost and others relieved at the lack of functions keys. Because the mouse reduces heavy reliance on a battery of such keys, the ones the Lisa has are sufficient. For example, veterans of other computers will have to get used to reaching for the Apple key instead of the control key, but they will not have to use it often.

The Lisa and Mac keyboards look alike but they do not feel the same. The Lisa keyboard takes a somewhat heavier touch, especially near the bottom of a keystroke, when spring resistance stiffens to tell you that you've struck the key. Rating keyboard feel is highly subjective. What one person likes, another may hate, but I prefer the Mac keyboard. I say this knowing that the Lisa engineers went to an outside supplier for their keyboards because they did not like the feel of the Apple keyboards.

The Screen

The Lisa has a built-in black-and-white screen that measures 12 inches diagonally. Text and graphics are displayed in black letters and lines against a light gray background. Images are extremely sharp and well defined; the screen has a resolution of 364 dots (pixels) vertically by 720 dots horizontally. Screen contrast is under program control and can be set to dim automatically after the computer remains untouched for a length of time, thereby guarding against permanently etching the currently displayed image into the phosphor.

The Disk Drives

All three Lisa 2 models have the same built-in 3 1/2 inch variable speed microdisk drive as the Mac. The drive has no door or eject button because disk ejection is completely under software control. This new drive can store 400K of formatted information on each disk, compared to 860K on each of the Lisa's twin disk drives. In exchange for the loss of disk space, the Lisa 2 owners get smaller, more convenient, and sturdier disks, not to mention complete compatibility with Mac software. Look for an add-on external micro disk drive from Apple later this year. Sony, maker of the microdisk drive, has been showing a double-sided drive at recent trade shows, which means that 800K per 3 1/2-inch disk is just around the corner.

Apple's 5-megabyte hard disk drive, the Profile, is standard equipment on the Lisa 2/5. It can be retrofitted to a Lisa 2, and as many as six additional Profile drives can be added to any Lisa. Each 5-megabyte hard disk stores nearly 13 times as much information as a single 3 1/2-inch microdisk and operates faster.

The Lisa 10-megabyte hard disk that comes with the Lisa 2/10 can be retrofitted to a Lisa 2 or 2/5. Expect to see larger capacity hard disk drives, both external and internal, from third parties who specialize in accessory disk drives and possibly from Apple, but don't hold your

breath while you wait.

Memory

All three Lisa 2 models have space for two memory cards. They are shipped with one memory card that contains 512k (1/2 megabyte) of RAM (random access memory). That's enough to run any Mac software and some software written especially for the Lisa. To run Lisa Office System software, you need another memory card. Theoretically, the Lisa Office System will run with reduced efficiency in as little as 3/4 megabyte of memory, but right now memory cards are available only in 1/2-megabyte denominations. Although memory chips that hold 256K each (four times the 64K of the Lisa's) already exist, they are costly and limited in availability. Someday they will make 4-megabyte Lisas a reality.

In addition to large amounts of RAM, the Lisa 2 has 16K of ROM (read-only memory). It contains permanent software that knows how to get the Lisa 2 started when you switch on the power.

The Microprocessor

All Apple 32 SuperMicros use the same microprocessor, the Motorola 68000. It handles twice as much information at one time as the Intel 8088, the microprocessor used by the IBM PC and most of its compatibles, and four times as much as the Intel 8080 or the Zilog Z-80 used in CP/M machines. On top of that, the 68000 in the Lisa 2 or the Mac processes information 60 percent faster than the 8088 in an IBM PC or its workalikes. It outpaces most 8080 and Z-80 computers by an even larger margin.

Serial and Parallel Ports

The Lisa has two serial ports (socket) in back. Plug a modem into one for telecommunication or perhaps to connect the Lisa to a local network, and plug a printer into the other. Each of the two serial ports provides full-duplex, asynchronous mode RS-232C or RS-422 communications at rates between 300 and 57,600 bits per second. They work just like the ones on the Mac, with one important difference: the Lisa serial sockets require 25-pin plugs, and the Mac sockets take 9-pin plugs.

The parallel port on the back of the plain Lisa 2 or Lisa 2/5 is for attaching an external hard disk drive. The Lisa 2/10 has no built-in parallel socket because it uses the circuitry for the internal hard disk.

Expansion Slots

The Lisa 2 has three expansion slots into which you can insert accessory cards. At the present time, only one kind of accessory card is available, a parallel card with two ports. Its primary use is for attaching additional Profile external hard disk drives. The future may see accessory cards for an external 3 1/2-inch microdisk drive, more serial ports, a color monitor, a high-speed arithmetic processor, and third-party hard disk drives.

Upgrades

Owners of existing Lisa systems can upgrade to a Lisa 2/5 or 2/10. The upgrade to a 2/5 is free until June 1, 1984, after which it will cost \$595. Authorized Apple dealers can perform the hardware upgrade in less than half an hour--it involves replacing the existing 5 1/4-inch drives with a single 3 1/2-inch drive and exchanging some ROM chips. Also included are microdisk versions of all the Lisa Office System software that you currently own.

Upgrading to the Lisa 2/10 involves switching from 5 1/4-inch disk drives to microdisk drives, and includes a 10-megabyte hard disk drive mounted above the microdisk drive, behind the louvered front panel. Instead of a simple ROM switch, the entire motherboard must be replaced. You will need an accessory parallel card to plug in your existing external hard disk (list price \$195). Upgrading from an original Lisa to a 2/10 costs \$2495 until June and \$2795 thereafter.

The New Choice

Apple has managed to rescue the Lisa from oblivion by offering it in various stages of undress, thereby forming an upper end to the new SuperMicro line, which is anchored by the Mac. Compared to the Mac, the Lisa is bulkier, heavier, shorter on charisma, and bigger in price. But it does offer considerably more memory, a larger screen (albeit flawed by distortion when running Mac software), a hard disk drive, expandability, and a broader software base. Among the four members of the Lisa-Macintosh family, no value leader stands out. More money buys more features. Let your budget and a fair assessment of your needs be your guide.

Access Information

The following is a list of prices and manufacturers for Lisa 2 products.

Prices

Basic Units

- * Lisa 1.0 \$6995
- * Lisa 2 \$3495
- * Lisa 2/5 \$4495
- * Lisa 2/10 \$5495

Manufacturers

The Lisa series

Apple Computer, Inc.
20525 Mariani Ave.
Cupertino, CA 95014
800/538-9696
In California 800 (622-9238)

Upgrades from Lisa 1.0

*To Lisa 2/5, free until June 1, 1984, \$595 thereafter

*To Lisa 2/10, \$2495 until June 1, 1984, \$2795 thereafter

XENIX

Santa Cruz Operations, Inc.
500 Chestnut St.
Box 1900

Santa Cruz, CA 95061
408/425-7222

UniPlus
UniPress Software, Inc.
1164 Raritan Ave.
Highland Park, NJ 08904
201/985-8M
Application Programs and Peripherals

- * Lisa Desktop Environment \$195
- * LisaList \$195
- * LisaWrite \$295
- * LisaCalc \$295
- * LisaTerminal \$295
- * LisaGraph \$295
- * LisaProject \$395
- * LisaDraw \$395
- * MacWorks \$195
- * Profile with access kit \$1895
- * 512K memory card \$1495

Printers

- * Apple Imagewriter \$595
- * Apple Daisy Wheel printer \$2195

Operating Systems

- * XENIX \$795
- * UniPlus \$495

Macintosh and Lisa 2 Specifications

	Mac	Lisa
Memory	128K RAM 64K ROM	512K RAM (expandable to 1M) 16K ROM
Processor	MC68000 32-bit	MC68000 32-bit
Display	9-inch diagonal screen 512 by 342 dots	12-inch diagonal screen 720 by 364 dots
Interfaces	2 RS-232C/RS-422/ AppleBus	Lisa 2, 2/5: 1 RS-232C serial port

serial ports 1 RS-232C/RS-422/AppleBus

Lisa 2/10:
parallel port internal to hard disk

Keyboard 58 keys
optional 10-key numeric
keyboard

58 keys
plus 10-numeric keyboard

Floppy disk storage 400K microdisk drive
3 1/2-inch media

400K microdisk drive
3 1/2-inch media

Hard disk storage options Available from
third-party developers

2/5:
external 5M hard disk drive
2/10:
built in 10M hard disk drive

Lisa 2 can be upgraded to 2/5 with an
external hard disk or 2/10 with an
internal hard disk

Weight Main unit: 16.5 lb.
Keyboard: 2lb. 5 oz.

Main unit: 55 lb.
Keyboard: 4lb.

Size Main unit:
9.7W/10.9D/13.5H in

Main unit:
18.5W/15.25D/13.75H in

Keyboard:
13.2W/5.8D/2.6H in

Keyboard:
18.5W/6.5D/2.5H in

Power requirements:

Line voltage 105 to 125 volts AC
Frequency 50 or 60 hz
Power 60 watts

115 to 230 volts AC
48 to 68 hz
150 watts max.

Environmental requirements:

Operating temperature 50° to 104°

40° to 108°

Humidity 5% to 90% relative

15% to 80% relative noncondensing

Byte
The Lisa 2:
Apple's Ablest Computer
By David D. Redhed

No other machine in Lisa's price range approaches its versatility, innovation, and power.

Lisa may be the most underrated machine in the history of the microcomputer industry. The recently introduced Lisa 2 line is more versatile than any other machine in its under-\$7,000 price category. In spite of this, the technical press remains preoccupied with the Macintosh and the public remains enthralled with IBM.

Granted Apple's marketing efforts on behalf of Lisa 2 have been less than herculean. And a dearth of software support still hobbles the entire Lisa line. Yet I see Lisa as the premier Apple offering. I've taken the time to look closely at this innovative, and now cost-effective, computer. There is simply no other machine in Lisa's price range that approaches its versatility, innovation, and power.

The three Lisa models--Lisa 2, Lisa 2/5 and Lisa 2/10--differ only in the amount of attached hard-disk storage they offer (none, 5 and 10 megabytes, respectively). The least expensive model, the Lisa 2 (\$3,495), is akin to a wide-screen Macintosh with half a megabyte of main memory. The unit also sports a single 3¹/₂-inch disk drive (400K-byte capacity) for external storage. The only apparent purpose for this stripped-down Lisa is to provide a vehicle that will run Macintosh software with four times the memory capacity of the Macintosh. No other commercially available software will run on the Lisa 2.

The Lisa 2/5 (\$4495) adds an external 5-megabyte hard disk. The 2/10 (\$5495) provides an internal 10-megabyte hard disk.

When it comes to expanding Lisa's hard-disk capacity, there are many ways to go. The Lisa 2 and 2/5 can be upgraded to 2/10 status for \$2,795. The profile on an upgraded 2/5 can be connected through a parallel card (\$195) for a total of 15 megabytes of storage. A 20-megabyte system can also be configured using all Apple disks for \$8,680. There is one external parallel port on both the Lisa 2 and 2/5 that is intended as the connection point for the 5-megabyte Profile drive. This port (the default port) is internal in the 2/10, since the hard-disk drive is internal. Any additional drive must always be connect via a parallel card, whether its augmenting a profile drive or a 10-megabyte drive. Lisa now supports a 70-megabyte drive manufactured by Priam and distributed by Tecmar. UNIX and XENIX users have the option of attaching drives from Corvus and Sunol in sizes from 20 to 100 megabytes.

All models of Lisa have two serial ports intended for use with printer and modem. Currently, no printers other than Apple-provided dot-matrix and letter-quality printers run with Apple developed software. Both the Imagewriter (dot-matrix) printer and the letter-quality printer connect through the serial ports (the Macintosh software expects a dot-matrix printer to be connected to serial port B only). UNIX and XENIX users have other printer options.

Lisa 2 has three expansion slots for peripheral cards. So far, however, only three such cards exist. Apple sells a parallel card providing two ports, and Santa Cruz Operations sells a serial card offering four ports. The Apple card is used primarily for attaching additional Profile drives but was originally used to support the first Lisa dot-matrix printer that

required a parallel interface. The Serial card is primarily used for supporting terminals under multiuser (UNIX or XENIX) operating systems. The Priam disk is attached through a special purpose interface card.

Unlike Macintosh, Lisa has both a high-resolution bit-mapped display and a character-generator display that supports a standard 24 by 80 screen. Having a standard screen-display options permit some conventional software to run on Lisa without display output conversion. This feature is critical to XENIX and UNIX users.

LISA OPERATING ENVIRONMENTS

The 11 different operating environments available on Lisa fall into three categories, those supporting business applications, those supporting business applications and software development, and those used purely for software development.

Three distinct user environments focus on business applications only. These are the Office System with fully integrated applications, the Office System with QuickPort applications and an applications oriented shell running under the Lisa Operating System.

The original Lisa software consisted only of applications that were fully integrated into the Office System. The QuickPort applications available on Lisa 2 are a new kind of application that share some, but not all, of the Office System Facilities. The Lisa operating system also supports multiple shells for the purpose of creating separate user environments.

The Office System contains three elements: Desktop Manager, LisaGuide and Lisa 7/7, a seven-function integrated program. Desktop Manager is actually a user-oriented operating system placed on top of a conventional operating system. The icons and windows and all of the actions taken to manipulate them are part of the Desktop Manager. LisaGuide is a tutorial program designed to familiarize users with Lisa's graphic interface. Lisa 7/7 is Apple's attempt to offer an integrated package like Lotus 1-2-3. Given its greatly reduced price of \$695 for all seven functions, 7/7 should be a competitive piece of software. Current owners of Lisa Office System software can upgrade to the new release for \$150.

The seven functions provided include:

- * LisaCalc, a 255 by 255 spreadsheet
- * LisaDraw presentation quality graphic drawing
- * LisaGraph graphs of discrete functions
- * LisaList, to display rows of two dimensional tables
- * LisaProject, a cost, time and resource scheduling program
- * LisaTerminal, a communication utility
- * the LisaWrite word processor

These applications are called "fully integrated" because they have access to all the Desktop Manager facilities. The seven functions provided in Lisa 7/7 include window support, pull-down menus, keyboard and mouse support, and the transfer of different kinds of data between the various applications.

Apple now considers Lisa 7/7 a complete integrated office application. In fact, Apple has discontinued support for the Toolkit, the development tool required to produce fully integrated applications. That is not very encouraging outlook for developers or for users who want extensions to the Office System.

Software developers do have an alternative. Its called QuickPort. As the name implies, this utility software provides a quick way to transport software into the Office System. QuickPort applications execute in a window on the desktop, but do not have pull-down menus and associated mouse interactions. The window may be divided into two panels, one for text and one for graphics. The contents of the graphic panel can be copied onto the clipboard and pasted into any application that can take graphic information from a LisaDraw document. Information from the text panel of the window can be copied to the clipboard and taken to any application that can receive text lines (e.g. LisaTerminal or LisaWrite).

BUSINESS APPLICATIONS AND SOFTWARE DEVELOPMENT

Four distinct operating environments support both program development and business applications. Those are MacWorks, the Workshop from Apple Computer, UNIX from UniPress, and XENIX form Santa Cruz Operations under license from Microsoft. MacWorks is simply a program that allows Lisa to run Macintosh software. The Workshop is very similar to the USCD Pascal system. UNIX and XENIX both use shells to provide a command-driven user interface to an underlying operating system. Users must already have or be willing to develop proficiency in computers before they can readily operate in any one of these last three environments.

When you start up Lisa under MacWorks, a portion of the Macintosh operating system adequate to handle disk I/O is loaded into memory. In fact, the equivalent of the 64K-byte operating system ROM is loaded and made accessible in a manner that is transparent to Macintosh applications. From this point on, Lisa 2 functions just like a Macintosh, with two major exceptions--the display screen is larger and the central processing unit is slower. Lisa's display area is physically larger than Mac's (101/2 versus 8 inches diagonally). It also has more pixels in both directions (720 by 364 versus 512 by 342), and the pixels are shaped differently. The pixels in the Lisa 2 are 50 percent higher than they are wide. Macintosh pixels are square. These differences combine to provide a larger working area. Unfortunately, Macintosh graphics appear to be stretched in the vertical direction when run on Lisa. Text looks surprisingly good but circles become ellipses and squares mutate into rectangles. Most non-mathematical shapes are acceptable in appearance but if you create graphics on Lisa 2 using MacPaint, you are in for a rude surprise. When you print the results, the printer will show the true form of the object, not what is on the screen.

The central processor on Lisa runs at 5 Mhz versus 8 Mhz on the Macintosh. The 5 to 8 ratio holds for graphic operations, but the ratio is 5 to 6 for most other operations.

The MacWorks program, first available in April 1984, would not function with Lisa's hard disk. A version released in September 1984 permits use of the Profile drive, and Mac files will coexist with Lisa Office System and/or Workshop files. They will not coexist with UNIX

or XENIX files. Attempts by Apple to develop utilities for file transfer between Macintosh and Lisa applications have not been successful. Developing programs using Macintosh BASIC or some other high-level language is practical on Lisa with the extra available memory. However, these programs must be small enough to run in the Mac's restricted memory.

The Workshop

Because the Workshop's user interface is similar to USCD Pascal's, Apple II or III Pascal users will feel at home rather quickly. The program contains many features not found in USCD Pascal, including a mouse-driven editor and sophisticated file-manipulation facilities. The Workshop contains all Lisa and Macintosh software development tools supported by Apple Computer. Since Pascal is the underlying language of Lisa software, all of the operating-system interfaces are in Pascal form. A 68000 assembler is available that can be used to create programs and procedures to run in the Pascal environment. A C compiler is also available, and procedures written in C can be called from Pascal (or vice versa). Both the Pascal and C Compilers have an option to generate code for either Lisa 2 or Macintosh.

In releases 1.0 and 2.0 of the Workshop, Apple offered the BASIC Plus language (compatible with Digital Equipment Corp. BASIC) and Cobol (an extension of ANSI 74). Only BASIC will be offered under release 3.0, but Apple will offer no technical support. COBOL has been dropped due to an insufficient number of buyers.

Using the Workshop with Pascal, C and the 68000 assembler, you can develop conventional keyboard oriented applications. Further, by using a multitasking operating system, QuickDraw graphics utilities, and the mouse interaction utilities supplied by Apple Computer, you can create any kind of environment you like. You can duplicate all the visual effects and user-interface features you see in the Office System with the utility software supplied in the various elements of the Workshop.

Extensive documentation of QuickDraw (the comprehensive graphics package used in the Office system) is included, along with some sample programs. The documentation of the operating-system interfaces is also good, and access to low-level information through these interfaces is excellent.

UNIX

The UniPress, Inc. version of UNIX is based on Bell Labs System V UNIX. The operating system is supplied with a C compiler, standard UNIX utilities, and Berkeley enhancements (visual editor, C shell, terminal independent library). The entire package sells for \$1,495. Hard disks from 20 to 100 megabytes are supported, and Ethernet networking is also available. Corvus and Sunol are the vendors of the hard disks that can be purchased through UniPress as part of a complete system for Lisa. UNIX will also work with hard-disk systems supplied by Apple.

Several applications programs are available from UniPress: the EMACS editor system, the

Lex word processor, UNIFY database, /RDB Database Tools, and the Phact ISAM file system. Of course, many other applications are available for UNIX, but not necessarily through UniPress. The UniPress system contains standard UNIX development tools such as a C compiler, text processor, utilities, and the multiuser kernel. By nature UNIX is a multiuser system. A single-user run-time system is also available as an option (\$495), however. Additional languages that can be used with the system include FORTRAN, Pascal, BASIC Plus, RM COBOL, SMC BASIC Four, and Irvine Ada.

XENIX

XENIX for Lisa 2 is based on UNIX System II and is available from Santa Cruz Operation. The system includes the full set of XENIX utilities, the C shell, the full-screen visual editor, system-administration commands, electronic mail, and support for UNIX networking. XENIX also provides "vsh" the visual shell that serves as a menu interface.

From one to four Profile drives can be supported by XENIX in addition to the 10-megabyte built-in disk of the Lisa 2/10. Support for other disks is not currently available, but future releases will include support for Priam and Sunol drives. XENIX will support two additional terminals through the two serial ports on Lisa. Santa Cruz Operations provides a four-port serial board to go into the standard Lisa slots. Up to two of these may be used to support as many as eight terminals.

Networking is supported through two separate features, "uucp" and "Micnet." The uucp feature provides point-to-point communication between pre-determined locations. Micnet is a full networking facility for user-to-user communications between a variety of locations. The XENIX Software Development Systems can be added to the basic operating system described earlier. This package supplies the C compiler and various utilities to support the production of programs including an interactive debugger and a source-code control system.

SOFTWARE DEVELOPMENT ONLY

Lisa 2 and Macintosh software development done by Apple so far have taken place entirely on Lisa, and the total development by Apple has been extensive. Pascal Workshop is the host environment for all development work, and there are four separate development tools currently available. QuickPort is used to move conventional applications into the Office System. Macintosh Supplement is used to develop Macintosh software. The toolkit is an unsupported system used to develop fully integrated applications for the Office System. Pterodactyl Software supplies an IBM BASIC Compiler with utilities used to convert BASIC programs written for the IBM PC for use on Lisa.

QuickPort supplies a window on the Desktop in which non-Desktop-integrated applications can execute in a conventional manner while gaining several of the desktop features. All of the window management and icon manipulations that are part of the Desktop environment are available to users. Inside the application window, there is no support for pull-down menus or mouse functions. Any applications desiring those features will have to provide all the graphics, menu handling and mouse interaction. All of the utility software to do these

things is supplied in the Workshop via Pascal units. This means that each development will have to produce his own set of logic to create a user interface. It is not even possible to take advantage of existing functions used by the current Desktop applications. (Those belong to the Toolkit environment.)

The positive side of QuickPort is that conventional applications that are brought over to Lisa and converted to run under the Workshop with a minimum of changes. Quickport is actually an application developed with the Toolkit--an application designed to run other applications. Quickport programs may consist of any combination of Pascal, C and assembly language code. Once a program is running in the Workshop, it can be packaged using a special set of libraries supplied by Apple. This new package is then installed in the Office System.

Each application automatically has a portion of its window devoted to text display, and the ordinary WRITELN and READLN functions of Pascal are routed to the window. You can copy text to our from the clipboard just as with any other desktop application. In addition you can split the window into scrollable portions, either horizontally or vertically. The application may specify a buffer size to control how much information is kept available for scrolling backwards. Optionally, an application can request a portion of the window to be set up for graphics. Any QuickDraw graphics performed by the application will be displayed in the designated portion of the window. The contents of the graphics panel can be copied out to any other desktop application that is a capable of accepting graphics information (e.g. LisaDraw, LisaWrite). Thus, QuickPort is a valuable tool if you want to quickly get an application into a partial Lisa desktop environment. The Toolkit and QuickPort are the only development tools that produce software for the Desktop. Applications created with other tools, excluding those for Macintosh, must run in conventional operating environments like the Lisa Workshop, UNIX or XENIX.

The Macintosh supplement to the Workshop consists of additional libraries of routines to support the development of Macintosh software. The standard Pascal compiler code generator and linker all have options to support Macintosh development. This supplement along with documentation called Inside Macintosh is available to interested parties willing to pay \$250.

The development approach involves creating the source code on the Lisa 2, compiling it and then transferring object code to Macintosh for checking. This transfer is typically done by creating a Macintosh disk on Lisa. Alternately through a direct communication line connected to the serial ports.

IBM BASIC COMPILER

A BASIC compiler for the Workshop is available from Pterodactyl Software converts IBM PC programs to run on the Lisa. Compiled into 68000 code, converted programs should run considerably faster on the Lisa than on a PC. Given the megabyte Lisa memory, applications could be modified to run substantially larger programs than the PC. Communications programs are also from Pterodactyl to transfer code from the PC to the Lisa.

PERFORMANCE

Lisa has taken hard knocks for performance and not without justification. The first release of the Office System software was quite slow when doing I/O input/output. Version 2.0 of the software which improved the I/O speed quite a bit was released in January 1984. I have not seen any comprehensive comparisons but company claims indicated a 60 percent reduction in time for certain operations. My experience is that the average improvement was more like 40 percent.

Table 1 contains some of my own performance figures for the Lisa 2/5 and 2/10. The 10-megabyte disk was 10 to 15 percent faster for most operations. All these tests were run under the Office System release 2.0. Release 3.0 is not supposed to have any performance improvements, but I have not been able to verify that the performance is unchanged.

Table 1: Lisa 2/5 and 2/10 performance figures.

	Empty Lisawrite file			37,000-byte LisaWrite File			Empty LisaDraw File			40,000-byte LisaDraw File		
	2/5	2/10	2/5	2/5	2/10	2/5	2/5	2/10	2/5	2/5	2/10	2/5
Measured times in seconds												
Test run immediately after start-up												
Open first time	29	25	0.9	33	28	0.8	34	27	0.8	98	90	0.9
Save and put away	15	20	1.3	63	51	0.8	14	16	1.1	13	14	1.1
Open second time	4	3	0.8	7	6	0.9	6	5	0.8	69	66	1.0
Set aside	6	3	0.5	7	6	0.9	6	5	0.8	8	8	1.0
Test run after two other applications are active												
Open first time	37	29	0.8	39	31	0.8	36	26	0.7	100	86	0.9
Save and put away	16	16	1.0	52	51	1.0	10	10	1.0	13	12	0.9
Open second time	5	4	0.8	7	6	0.9	7	5	0.7	68	70	1.0
Set aside	6	4	0.7	7	7	1.0	6	5	0.8	8	8	1.0
Save a duplicate	12	14	1.2	18	20	1.1	4	4	1.0	20	20	1.0
Copy disk to hard disk	3	3	1.0	17	15	0.9	4	3	0.8	16	15	0.9
Copy hard disk to disk	4	3	0.8	18	20	1.1	4	4	1.0	20	20	1.0

When trying to evaluate the performance of the Office System in absolute terms, you should take several things into account. "Opening a document" in Lisa includes more activities than in most systems. The 33 seconds required to open a 37,000-byte LisaWrite document for the first time after starting the system made me wonder what exactly was going on.

Actually, I discovered quite a bit. First, the LisaWrite program is being brought into memory and activated. Second, a copy is made of the requested document. In Lisa you never work on the original. Since opening an empty document takes 29 seconds, initiating LisaWrite accounts for most of the time required by the larger document. Note that opening the document a second time takes just 7 seconds.

And additional factor affecting performance is the underlying overhead of a fail-safe system. The Lisa Office System is capable of recovering all the data files on the hard disk even if the main catalog is lost or damaged. This is accomplished by redundant storing of enough information to rebuild the entire directory. This fail-safe mechanism adds significantly to I/O times. You might argue that you would rather risk an infrequent loss of data rather than suffer speed degradation on each and every I/O operation. That, however, is a system design issue and not a valid criticism of system performance.

I also ran some tests on the 2/5 and 2/10 for 11 different Pascal I/O operations. Here the 10-megabyte disk was never faster than the Profile drive (contrary to the Office System results). Most operations were about 10 percent slower and one operation was 50 percent slower. Table 2 shows the individual results along with a characterization of the type of Pascal I/O used. I am unable to reconcile those results with those from the Office System tests. I can only assume that the difference is due to a different kind of I/O logic used by the Desktop Manager.

Table 2: Pascal I/O benchmark results

Test #	Description	Time in seconds		Ratio
		2/5	2/10	2/10 to 2/5
1	Write 1024 text lines of 8 bytes each (WRITELN)	11.0	11.8	1.1
2	Read 1024 text lines of 8 bytes each (READLN)	6.5	6.4	1.0
3	Write 8 text lines of 1024 bytes each (WRITELN)	8.0	9.3	1.2
4	Read 1024 text lines of 8 bytes each (READLN)	4.8	5.0	1.0
5	Write 1 text line 8192 bytes (WRITELN)	8.1	9.0	1.1
6	Read 1 text line 8192 bytes (READLN)	5.8	6.2	1.1
7	Write 8192 bytes in a single block (BLOCKWRITE)	1.5	2.3	1.5
8	Read 8192 bytes in a single block (BLOCKREAD)	1.4	1.4	1.0
9	Write 100 records of 100 bytes each (sequential PUT)	7.3	7.8	1.1
10	Read 100 records of 100 bytes each (sequential GET)	1.4	1.4	1.0
11	Read 100 random records of 100 bytes each (random GET)	5.8	7.4	1.3

CONCLUSIONS

Its fair to say that Lisa 2 gives its owners the freedom to run a wide variety of operating systems and applications. Its large memory and ability to use several sizes of hard disks are major factors in its versatility. Lisa's uniqueness as new technology has faded. And though Macintosh has pushed Lisa into the background, it may actually spur interest in Lisa over

the long term. Further, until Macintosh is supplied with more memory, Lisa is the only practical way to run even moderately large Macintosh applications.

So far, Apple Computer does not seem inclined to market the Lisa aggressively or to give full support to Lisa software. In spite of this, I continue to think that the technology represented by the Office System is a giant step forward. It may well be that while the industry is not able to embrace it totally, it will end up adopting Lisa technology in small pieces over the next few years.

THE LISA OFFICE SYSTEM

In July 1984, Apple released version 3.0 of all the Lisa software. What used to be marketed as seven integrated applications is now called Lisa 7/7, a single application with seven functions. The operating system is included for \$695, and release 2.0 owners can upgrade for \$150, even if they do not own all seven applications.

The seven functions available in Lisa 7/7 cover all the common activities in the business office with the exception of accounting. The Lisa series of integrated programs can calculate, draw, graph, sort and maintain lists, make projection decisions, communicate at 100 to 19,200 bps (bits per seconds), and do word processing.

THE PROGRAMS

LisaCalc is a spreadsheet calculator that offers you a 255 by 255 matrix, natural-order evaluation, and up to 126 data digits visible on the screen. The program locates circular references and each column of the spreadsheet may have a different width. The spreadsheet also performs calendar-date calculations.

The 3.0 version of LisaCalc adds the natural-order evaluations and circular references as well as internal rate of return, a display of both storage requirement and recalculation time, and an option to print with any combination of headings, grid lines, and row and column titles.

LisaDraw is especially suited to presentation graphics. Its maximum document size is four feet by eight feet, and it will print along either axis of the paper. Images are stored in mathematical form and can be easily edited and resized.

Lisa's 3.0 release of LisaDraw offers color output to Canon's color printers for the first time. You can also print up to an 11-inch boundary. Your images can be rotated, flipped, and reduced up to 25 percent.

LisaList offers users an elementary relational database, eight data types (text, number, social security, zip code, date, time, telephone, and cost). You can sort your data on multiple columns in ascending or descending order and can search the list in any of six ways. Columns can be added or deleted, and any column can be hidden from display.

Version 3.0 of LisaList offers some increase in integration.

LisaGraph offers the same table of values as LisaCalc, 255 by 255. You can draw full-page, half-page and quarter page and can reduce the document to fit the display screen. Under

LisaGraph you have seven graph types--point, line, bar, stacked bar, 3-D bar, pie, and area.

The stacked bar, solid bar, and area graphs are new with version 3.0 and so is the display of linear regression and line correlation coefficient. You can also use color output to Canon's new color printer and add text anywhere on the graph.

LisaProject is a task and cost scheduler performed with pert-chart-like diagrams. Resource and task bars charts and task cost charts are derived automatically from the scheduled chart. The critical path is calculated and displayed, as are early-start/early-finish and late-start/late-finish. Fixed costs may be specified for each task and a maximum of five labor resources.

The task cost charts are new with version 3.0 as is the ability to specify resource costs and project those costs onto resource and task charts. You can also fix task costs in this new iteration of LisaProject.

LisaTerminal supports XON/XOFF protocol and can communicate anywhere from 110 to 19,200 bps. A window contains all transmissions, and you can scroll backwards. You can maintain multiple connections and switch back and forth between them. You can also retain custom transmission setups. Version 3.0 of this program offers very little that is new.

Under LisaWrite your document size is limited only to the amount of hard-disk storage. Multiple type sizes and proportional spacing are available to you. On-screen rulers let you adjust the margins of your copy, and LisaWrite's search facilities include case and wild-card options.

Add to the above features an 80,000 word spelling checker available in version 3.0 and a 750-word extension for words of your own.

USING LISA 7/7

The Lisa programs are integrated in three distinct ways; they each work from a common user interface, data can be transferred between most, but not all, of the modules, and you can suspend activity in one program and activate any other.

With its uniform programming conventions, Lisa 7/7 really excels. Test-editing conventions are identical across all modules and in all circumstances. Whether you are naming a document or supplying a set of characters to search a document, you edit text the same way. Also the pull-down menus of Lisa are used in all functions and always operate the same way.

The various data transfer paths are shown in figure 1. Table 1 shows you the data formats that each of the 7/7's functions can create, receive, and/or send.

(add picture)

Table 1: Types of data that a Lisa 7/7 program may create, retrieve or send.

	Text	A Table	Graphics
LisaCalc	Create Receive Send		
LisaDraw	Create Receive Send		
LisaGraph	Create Receive Send	Create Send	
LisaList	Create Receive Send		
LisaProject	Create Send	Create Send	
LisaTerminalReceive	Receive Send	Send	
LisaWrite	Create Receive Send	Create Receive Send	Receive Send

Text = one or multiple-line paragraphs separated by carriage returns

A Table = multiple lines of text containing tabs and separated by carriage returns (tabs indicate columns and carriage returns indicate rows)

Lisa ability to switch quickly between programs is a direct consequence of the multitasking operating system. Under 7/7, your current function is deactivated when you switch to another program. No matter how long you stay away or how many other functions you activate in the meantime, returning to the original program will recapture the state at which it was interrupted.

The same kind of switching applies if you activate the identical function on different documents. Thus you could have three or more word-processing documents in progress and switch back and forth between them without disturbing the states of any of them. This kind of integration is difficult to achieve with conventional microcomputer operating systems.

Photo 1 (ed--not shown) is a screen display of three windows belonging to three different functions of Lisa 7/7: LisaDraw, LisaGraph, and LisaWrite. The dark shading indicates

that this is the currently active window created by LisaDraw.

Successively activating the other two functions and returning to "Floor Plan" takes a total of 14 seconds. This is contrasted with the approximately two minutes it took to open all three documents initially.

In a similar manner, if one LisaGraph document is closed and another one is opened, the only time required is that taken to load the new document and connect LisaGraph to it. The LisaGraph program is already in memory and does not have to be reloaded. In this case, the new document is displayed in a new window in just 20 seconds, in contrast to the 43 seconds for the first document opened by LisaGraph.

Obviously the megabyte of memory in Lisa will hold only so much, then things must be moved out to make room for additional documents or functions. Even with small documents, all seven functions will not fit in memory simultaneously. I have found that three functions with moderate documents (5 to 10 pages) or two functions (15 to 25 pages) will cohabit memory without require significant swapping to the hard disk.

Lisa 7/7 is a powerful package for the price--\$695. With Lisa 2/5, the extra 1/2 -megabyte of memory, and a dot-matrix printer, the total system price comes to about \$7,300. If the functions in Lisa 7/7 satisfy your requirements there is not a better buy.

CONVERSION TO THE LISA 2

By the time this is published most owners of the original Lisa will have converted to the Lisa 2. There are three parts to the conversion process: getting all you files ready to be converted, making the actual hardware modifications, and updating to the new system software.

The most troublesome (and potentially risky) part of the conversion is getting all your files on the Profile drive before converting the hardware. This is necessary because the new system does not have any software drivers for the old 51/4-inch disks drives. If you convert and then find some files you forgot, there is no easy way to recover them. For everyone except developers the hardware conversion is done by a dealer. (Developers are given the kit to make the conversion themselves.) It involves swapping the old 51/4-inch Apple drives for the new 31/2-inch Sony drive, swapping some integrated-circuit chips, and cutting one or two resistors off a board. In my case, the conversion went very smoothly.

The last step is to update the Profile drive with the new system software. All Lisa 2 conversion kits contain release 2.0 of the Lisa software system, which involve modifications down at the disk-directory level. When you update the drive, all the file-formatting changes are made at the same time, although users are not really aware that this is happening.

Once you have converted, you are unable to do a disk-to-disk; you must go through the Profile drive as an intermediate step.

AT A GLANCE

Name

Lisa 2

Manufacturer

Apple Computer
20525 Mariani Ave.
Cupertino, CA 95014
(408) 996-1010

Size

13.8 by 18.7 by 15.2 48 pounds

Power Requirements

90-130 V AC 48-68 Hz (U.S. model)
180-260 V AC 48-68 Hz (foreign model)
150 watts (both models)

Processor

MC68000 5-Mhz clock

Interface Slots

Three slots for peripheral interface cards

Peripheral Connectors

All models have a mouse connector, keyboard connector, and two serial-port connectors (25-pin D-shaped plugs). The Lisa 2 and 2/5 also have a parallel connector intended for connecting a hard disk (25-pin D-shaped plug)

Keyboard

2.7 by 18.7 by 6.5 inches; 4 pounds

Memory

524,288 bytes (1/2 megabyte) standard for all models; expandable to 1,048,576 (1 megabyte)

Mass Storage

All models have one Sony 3 1/2-inch drive with a 400,000 byte capacity; Lisa 2/5 has a 5-megabyte external Profile hard-disk drive; Lisa 2/10 has a 10-megabyte internal hard-disk drive

Video Display

12-inch diagonal tube with a displayable area of approximately 8 by 6 inches; 720 pixels horizontally and 60 pixels/inch vertically (pixels are 50 percent higher than they are wide); bit-mapped graphics page requires 32,760 bytes; screen refresh rate is 60 Hz; horizontal line rate is 22,900 Hz; dot rate is 20 Mhz

Options

Parallel interface card with two ports (25-pin D-shaped plugs)

Hardware Prices

Lisa 2	\$3495
Lisa 2/5	\$4495
Lisa 2/10	\$5495
Conversion of Lisa 2 or 2/5 to 2/10	\$2495
Conversion of original Lisa to a 2/5	\$595
1/2 megabyte memory	\$1495
Parallel interface card	\$195
ImageWriter dot-matrix printer	\$595
Daisywheel printer	\$2195

Software Prices for Apple-Supplied Software

Lisa 7/7	\$695
(contains Desktop Operating System, LisaCalc, LisaDraw, LisaGraph, LisaList, LisaProject, LisaTerminal, LisaWrite)	
Upgrade from version 2.0 of the Office System applications	\$150
Pascal Workshop	\$395
MacWorks	\$195

The Book, *West of Eden* provides a look at the history of Apple Computer. The following excerpts detail how the Lisa fit in the Apple corporate plans.

WEST OF EDEN

Lifestyle

By Frank Rose

Like David Bowie and several of the other more discerning stars, Steve Jobs liked to stay at the Carlyle when he came to New York. It had large suites, stunning views, plenty of cachet, and a lingering Cafe Society ambience that recalled the era of big-band jazz and transatlantic crossings. It was particularly nice for press tour, a little out-of-the-way for the journalists, perhaps, but unusual enough to make them take note. Besides, no one would mind going twenty or thirty blocks uptown for a private preview of Lisa, Apple's exciting new business computer. The official unveiling wouldn't take place until the 1983 annual meeting on January 19, which was still two weeks away; and yet Jobs and his entourage—three vice-presidents, a public-relations woman, and some technicians—had flown out from California to demonstrate it in person to a few select members of the press. Andrew Pollack of *The New York Times*. Richard Shaffer of *The Wall Street Journal*. *Forbes*. *Fortune*. *Business Week*. *Time*. *Newsweek*. A handful of influential newsletters that covered the personal-computer industry for the Wall Street investment community. And when these favored reporters arrived—one at a time, at one-to-two-hour intervals—they were ushered into a tower suite high above the city, a secluded aerie overflowing with cut flowers and strawberries, where they found an incredibly buoyant-looking Steve Jobs and, in front of a window overlooking Central Park, his newest machine, the one that would revolutionize the American office.

It looked quite dramatic, this Lisa: tan, sleek, and sexy, its screen cantilevered out over the keyboard and aglow with pictures—file folders, a clipboard, a calculator, a wastebasket. A thin cord across the tabletop to a palm-sized “mouse” that controlled an on screen, the arrow and the mouse moving in one-to-one correspondence like partners in some electronic tango. The overhanging screen gave it a powerful forward thrust; the pictures and the mouse it seem as playful and full of pizzazz as a video game was no stodgy number-cruncher, no clunky contrivance devised for anonymous functionaries in the back office. No, Lisa was everything the name implied: pert, vivacious, friendly. And sitting on that table above Manhattan, with the vast sweep of parkland below and the Ramapo Hills of New Jersey on the horizon and the cold January skies above, it looked as if it could soar.

Jobs and his three vice-presidents had been thoroughly rehearsed before they came to New York. The people at Regis McKenna, Apples's public-relations agency, had fed them every embarrassing question they could think of. Why is Lisa so late? (It had been in development for four years.) Is Lisa really ready to be introduced now? Won't Lisa compete with Apple's other products? McKenna was the hottest public-relations and marketing operation in Silicon Valley, headed by a fleshy, red-haired man whose business cards read “Regis McKenna himself” and staffed with uniformly attractive young women who were known around Apple as the Regettes. Jobs had come to Regis an anemic-looking kid in cut-off jeans, his sallow face framed by limp hanks of hair; now he was chairman of the board of

Regis's biggest success story. He'd also become an extraordinarily polished young man, having recently discovered double-breasted Italian suits, which made a nice counterpoint to his more typical blue jeans and pressed white shirt. And while he was physically slight-short and thin, with tight, pursed lips and a somewhat high-pitched voice--he resonated with kinetic energy. Blessed with the piercing eyes and magnetic enthusiasm of a born pitchman he'd been groomed to make the consummate pitch.

And this was the moment for it. A year and a half earlier, when IBM had entered the personal-computer field, Apple had responded with ads that read "Welcome, IBM. Seriously." Now Apple, which had been beating out less formidable competitors like Radio Shack and Commodore, was running afoul of the IBM juggernaut. It wasn't IBM's technology that made the PC sell--the technology, to anyone serious about computers, was almost ridiculous. It was the name. In a world of fly-by-night start-ups pushing gadgets most people were still afraid of, IBM was a name that seemed carved in stone. Apple was six years old and still riding on the success of a single product, the Apple II--an obsolete machine whose appeal seemed likely to dissipate at any moment. The astonishing thing was that this one machine had given Apple a quarter of the personal-computer market and an ever-increasing spiral of sales that in 1982 had hit \$600 million. But the company's only follow-up, the Apple III, had fizzled on introduction, with technical problems so severe that the first fourteen thousand had to be recalled and replaced. Any hope of beating IBM seemed to rest with Lisa.

It was hardly surprising that Apple's success should have attracted the notice of the biggest computer company in the world, the \$40 billion behemoth that to California's antiestablishment techies had always represented evil incarnate. But the IBM PC, introduced in August 1981, had both "legitimized" the personal computer and changed the course of the revolution it was supposed to engender. "One person-one computer" was Apple's motto, a phrase born of Jobs's conviction that the democratization of computer power would alter the balance between the individual and the institution. But on Wall Street, two things were now becoming apparent: first, that the real usefulness of these machines was not in the home but in the office; and second, that their ultimate effect might be not to liberate the individual but to tie him all the more closely to his fellow workers and perhaps to the mainframe as well. Wall Street's role was to weigh the players and call the odds; and as these realizations began to dawn, the odds were shifting in IBM's favor.

From Apple's perspective, however, things didn't look that way at all. From Apple's perspective, they were on a roll. The Apple II was the most successful personal computer ever sold. The Apple III was a freak, embarrassing yet hardly fatal. And Lisa was going to astound the world. Jobs wasn't worried about Lisa. What he was upset about now was Time magazine.

A week earlier, in its final issue of the year, Time had named the computer its "Machine of the Year" for 1982. At one point Time's editors had been thinking seriously of naming Steve Jobs Man of the Year; but that fall, as the IBM PC became more and more a success, they'd decided it would be hard to justify putting Jobs on the cover. As the publisher observed in his letter on the contents page, none of the human candidates they might have picked would be viewed by history as more significant than the computer itself. So Jobs had been

bounced by the machine on whose behalf he'd been proselytizing and the extensive profile that would have accompanied his selection had been boiled down to a mere three pages. In those three pages however, Time had managed to telegraph a great deal of embarrassing information--most notably that Jobs, the twenty-seven-year old entrepreneur with a net worth of some \$210 million, was under a court order to pay \$385 a month in child support to the mother of a little girl named Lisa.

The name Lisa had been one of the more controversial issues of the new computer's development. For a while Apple's executives had thought of calling it something more professional-sounding, something like the Apple IV or the Apple 400. But Lisa was above all friendly computer, and they wanted a friendly name for it. The thought of other names too, like Applause or Esprit; but Applause didn't stick, and Esprit was already taken. So finally they'd gone back to Lisa, which had been the code name all along. Lisa was the name of the original chief hardware engineer's daughter (that was back in 1980, several chief hardware engineers previously), and he'd started a tradition of code-naming computers that Apple engineers were still following. Lisa was also the name of the little girl who'd been born in the summer of 1978 to the woman Jobs had lived with a few months before. Not many people knew about this Lisa's existence and Jobs had long contested his paternity; but in going with Lisa the machine, they'd decided to chance the story's coming out.

The Time article had been off the stands only a few days when Jobs and his vice-presidents arrived at the Carlyle; he was still smarting from the treatment. An orphan himself, adopted in infancy, he was now in the awkward position of having publicly disavowed a baby girl whose mother said she was his. And he hadn't done it any too nicely, either: "Twenty-eight percent of the male population the United States could be the father" was what he was quoted saying. But it wasn't remorse at what he'd said that Jobs felt; it was outrage at what Time had done to him. More than anything else, he felt violated.

But the reporters who came to the Carlyle were more interested in Lisa the computer than in Lisa the child--not surprising for a industry that was more entranced by circuitry than by personalities. There'd been rumors about Apple's new machine for months. The Wall Street Journal had reported its existence more than a year before; Business Week had quoted a stock analyst who called it "the next quantum jump in technology." The reporters all knew that Lisa would be much bigger and much more expensive than anything Apple had made previously--as much as \$10,000 per machine, compared with \$1,500 for the Apple II--and that it represented a development effort that, by Apple's standards at least, seemed almost superhuman. As they marveled at its sophisticated graphics and grappled with its unfamiliar mouse. John Couch, the vice-president who headed the division that built it, told them proudly that the development costs had come to more than \$50 million--\$20 million of it in software alone.

What Apple had come up with was an office computer that worked in ways most computer users hadn't even dreamed of. The most obvious innovation was the mouse--the palm-sized device you rolled across a desktop to point to a spot on screen. But that was just emblematic of the deeper changes that had been made. Every other personal computer was controlled by "text-oriented" commands: if you wanted it to do something--say, move a paragraph around you had to type in some mumbo-jumbo code that you'd either la-

boriously memorized or just spent half an hour looking up. Lisa used visual commands: if you wanted it to move a paragraph, you used the mouse to shade the paragraph and point to the spot where it was supposed to go; then you clicked the button on the mouse's back and watched as the paragraph magically reappeared where you wanted it. If you wanted to throw the whole letter away, you used the mouse to drag a picture of a letter to a picture of a trashcan and deposit it there. What was great about Lisa, Couch told one reporter after another, was that it was intuitive. You didn't have to spend a month just learning how to use it; as the brochures said, "It works the way you do."

Like Jobs, Couch was young and energetic, with a high-pitched voice and a passion for his work. A computer scientist whose speciality was software, he was emblematic of the new breed of professionals Apple had started hiring in 1978. He'd been brought in to function simultaneously as Jobs's mentor and his sidekick, and it was as a team that they'd discovered the features that made Lisa so special--a fact that had only increased Jobs's anger when Apple's president set up a separate product division for Lisa and picked Couch to head it. Jobs wanted to run Lisa himself; when told he couldn't, he'd taken over an experimental project called Macintosh-five people in an annex who were building a low-cost "people's computer." Couch got the future of the company, and Jobs made do with five people in an annex. They had a \$5,000 bet on which of them would come out first.

The same people who were speculating about Lisa right now we also speculating about Macintosh. Esther Dyson, whose industry newsletter was beginning to earn her a reputation as the Rona Barret of personal computers (she knew the inside story of every piece of circuitry in the business), had just told The Wall Street Journal the Macintosh was what's "really exciting," because it had most of Lisa features at a cheaper price. That was something you heard a lot. But Dyson had also noted another new machine, the Apple IIe, which she'd astutely predicted would be "the breadwinner of the year." The IIe was this year's Apple II, a re-engineered version of the old standby, updated for the consumer's benefit and at the same time cost-reduced for Apple's. The theme of the upcoming product introduction was "evolution/revolution"-a play on the Beatles song and if Lisa was the "revolution," the IIe was "evolution." It was represented at the Carlyle by another vice-president, Paul Dali, older and rather distinguished-looking man who was co-manager of the division that was responsible for the II and for its ill-starred successor, the Apple III.

The final vice-president in the room was E. Floyd Kvamme, who just been hired to run Apple's sales and marketing. Kvamme (the name is Finnish and, since the v is pronounced like a w, has a soft melodious sound) had until November been president of Nation Advanced Systems, a subsidiary of National Semiconductor which built IBM-compatible mainframe computers. He was generally regarded as one of the best marketing men in the Valley, and one the few of whom it could be said that polyester never touched his wrists. His quietly authoritative manner made an effective counterpoint to the boisterous behavior of Jobs and Couch. Throughout the day, as the two boy wizards bounced off walls in their eagerness to display each new wonder to the visiting reporters, Kvamme stood the background, his calm presence providing a reassuring suggestion of corporate stability.

Late in the afternoon, after the last reporter had gone, a final visitor arrived: John Sculley, the president of Pepsi-Cola. Jobs introduced him as a good friend who was thinking of

buying Lisas for his company. In fact, he was the man Jobs wanted to run Apple. The current president, Mike Markkula, was a semiconductor millionaire who'd bankrolled the company when Jobs and Steve Wozniak were still running it out of Jobs's parents' garage. He'd been chairman until 1981, when the first president-Mike Scott, an old buddy from his days in the semiconductor industry-was fired for shaking up the company too drastically after the Apple III fiasco. Markkula had stepped in to fill Scotty's role, and Jobs had been named chairman. But Markkula didn't fancy himself a CEO, and it was no secret that he wanted to be replaced. The man most people at Apple thought would replace him was Floyd Kvamme.

Kvamme, however, knew better. Another of Markkula's pals from the semiconductor industry, he'd come to Apple only a couple of weeks before this trip to New York. Before he took the job, he'd asked Markkula if he was going to stay, and Markkula had told him that Apple was looking for a new president. They wanted somebody with experience in consumer marketing, he explained-Kvamme's expertise, like Markkula's, was in marketing to engineers-and they had a candidate who was seriously considering the position. Kvamme got the impression that they were having trouble landing their candidate, and he was secretly hoping that Markkula would stay on a while longer so he could learn the ropes himself. But when Sculley walked into the suite at the Carlyle, Kvamme knew right away that this was their man.

So there they were, Jobs, Couch, Kvamme, Dali, and the chief Regette, all greeting the president of Pepsi-Cola, a trim, self-assured, and very corporate-looking individual whom Jobs was introducing as his good friend from New York. It was obvious to all of them that Jobs liked this person a great deal. Jobs and Couch demonstrated Lisa for him, and like everyone else he marveled at the sheer gee whizziness of its technology-at the mouse you could roll across the desktop, at the little pictures ("icons," they were called) you could point to when you wanted it to do something new, at the overlapping "windows" which allowed you to flip back and forth from one document to another with ease. But he didn't take to it wholeheartedly. He was cautious. He had reservations. He wasn't sure that this new technology, dazzling as it was, would have much impact at a big corporation like Pepsi, because it didn't carry the IBM logo. Nobody ever got fired, the saying went, for choosing IBM.

.....

Page 90

That evening Steve and John joined Mike Markkula and the division managers at Pajaro Dunes, where for the next two days they would hole up in a beach house with only one telephone and thrash out a product-line strategy for the company. This was Markkula's only official act of transition; he hadn't even met with Sculley when he'd arrived, just sent him a stack of boxes full of papers. A long list of issues was on the agenda. Should Apple's office strategy be built around Lisa or Macintosh or both? Should they try to make Lisa and Macintosh compatible? How could Apple coexist in an office market dominated by IBM? Should it build an IBM-compatible Apple II? Should it phase out the Apple III? Should it go into the software business? What business posture should it assume anyway?

A few days after his arrival, John had sent out a memo outlining the requirements of a “go-for it” strategy: “Get in front of the power curve . . . continued success of our Apple II products . . . nothing major can go wrong ... must preserve our incredible entrepreneurial environment. . . .” He’d told the exec staff that Apple had an opportunity to break away from the pack and make this a “two-horse race” with IBM. But to do so, he warned, meant adopting a high risk, high-reward strategy that would put heavy stresses on the organization and, he might have added, on the people in it.

Well, they were going for the gold. Why not? Excitement over Lisa, coupled with a general infatuation on Wall Street for high-tech companies, had just pushed the stock up to \$55 a share, up from \$39 when Sculley arrived and \$29 at the beginning of the year. In the past four months the net worth of everyone present-in most cases already measured in the millions of dollars-had nearly doubled. Almost 12,000 Lisas were on order, with shipments to begin in two weeks; over the next twelve months they were expecting to sell 57,000 units. Fiscal 1983 was going to be a billion-dollar year, and when they added up the projections for fiscal ‘84 it looked like they could hit \$2.5 or even \$3 billion. John declared that he hadn’t come here to take Apple from a \$1-billion company to a \$2-billion company; he’d come here to take it from \$1 billion to \$10 billion. There was excitement in the air, and a touch of euphoria.

They spent both days hashing out the issues. They had breakfast sessions, lunch sessions, dinner sessions, and in between they sat around on sofas in the living room. John kept asking questions, some of them tough. How was all this going to play together? What was it going to mean in the office? Was Apple a bunch of disparate parts or a coordinated whole? Gene Carter, the vice-president of sales, wanted to make Lisa and Macintosh fully compatible; Steve didn’t. He wanted to sell Macintosh at \$1,000, and he knew he couldn’t do that if he had to equip it to run Lisa’s sophisticated but cumbersome software. Macintosh had been cleverly engineered to capture the 20 percent of Lisa that gave 80 percent of the benefit. So they compromised on the idea of a Macintosh “window” on Lisa--a technique that would enable Lisa to use a fraction of its power to run the software that was being developed for Macintosh.

.....

Page 114

What was bugging the Lisa people was that damn pirate flag. Susan Kare, the artist who was designing the Macintosh icons, had painted the skull-and-crossbones on a piece of black cloth, and at the beginning of the summer, when the renovation of Bandle 3 had finally been completed and the Macintosh division was moving in, she’d stolen onto the roof with one of the software guys and hung it from a pole on top of the building. It had been flying there for weeks, right across the street, waving in their faces, as if the Mac group were going to seize their building with grappling hooks and swarm aboard with cutlasses between their teeth and send them all to the bottom of the sea.

Band of pirates indeed. The way it looked to the rest of the company, the Macintosh crew lived more like kings than like pirates. Bandle 3, which as headquarters for the Apple II division had been packed knees-to-elbows with some two hundred people, had been

renovated for Macintosh to hold half that many. For a while there'd even been talk of calling in an exorcist to rid the place of the lingering vibes of the Apple III, but Jay Elliot had put a stop to that. Steve wanted his team to be inspired by great products, so he parked his BMW motorcycle in one corner of the spacious atrium and a Bösendorfer piano in another corner. They got great fruit juices too--free juices, which they stocked in their refrigerator at company expense. They got business cards with funky titles--"hardware wizard" for Burrell Smith, "software wizard" for Andy Hertzfeld, "Macintosh artist" for Susan Kare. And because Steve considered them all artists, the conference rooms on either side of the atrium were named "Picasso" and "Matisse." They were mirror images of each other, and the funny thing was that nobody could ever keep them straight.

But it was the pirate flag that really galled the Lisa group. They ran up their own flag, one that bore the Lisa logo--a brave gesture, but an empty one. The whole thing was unnerving, especially with Couch gone and all the bad press they'd been getting. The pride and euphoria of January were gone. In their place were nervousness and fear.

The euphoria had been based mainly on the response Lisa had gotten in sneak previews, when reporters and representatives from Fortune 1000 corporations were led in more or less blindfolded and given a few well-orchestrated moments to play with the machine. The reaction then was uniformly favorable. But in June, when Lisa started shipping and potential customers finally got a chance to spend some time with it, the response wasn't so good. People complained about its \$9,995 price tag. They complained because to buy it you had to buy the six integrated software packages that came with it. They complained that it was slow--that to do anything on it required an agonizing wait, because the software was so complex and the computer code that made it run was so voluminous. They complained that it couldn't share information with any of IBM's computers. And worst of all, they weren't ordering it. In May there'd been a backlog of 12,000 orders; by midsummer that backlog was gone. Something was wrong.

Certainly that was how it looked to Wayne Rosing, the engineering director who'd taken over the division from Couch. Rosing had been running mid-range systems development at Digital Equipment when Couch hired him; Digital had just turned down his proposal to build a minicomputer using the same Xerox PARC technology that Apple wanted to build into Lisa. Couch's offer came at just the right time. But two years later, in September 1982, when they were about to introduce Lisa to the world, it had suddenly occurred to Rosing that maybe they shouldn't go through with it. At that point everything was ready to go: Marketing was giving sneak previews to potential customers, and his own engineers were already working on data communications networks so Lisa could be integrated into the corporate office environment, sharing information with other computers. But when he looked at what Jobs was doing with Macintosh, how he was creating a computer that was personable and winsome and charming, as only the Apple II had been charming before it, Rosing realized that the corporate office environment was not for Apple.

Apple built computers for individuals. Lisa was taking it into the systems business--complex and expensive products that had to be sold directly to corporate customers by an Apple sales force and serviced by a trained support staff. IBM played the systems game flawlessly. For Apple to do so would require exponential increases in commitment. Did Apple really

have the follow-through needed to win? Maybe, Rosing thought, they ought just to cancel Lisa and put the Lisa people to work writing software for Macintosh. The idea was preposterous, of course. He'd suggested it to Couch one day as a joke and they'd tossed it around for a few minutes, but marketing had these sales projections that said they had all these computers sold-what were they, crazy?

.....

Page 140

Lisa was a problem. Sculley's big question all fall had been how to use Lisa to support Macintosh. The solution he'd come up with was to turn Lisa into Mac's big sister. Lisa engineers had taken out the Twiggy drives and put in Sony drives so people could use the same disks in either machine, and they'd developed a program that would allow Lisa to run Macintosh software. (Macintosh had about one-eighth Lisa's memory, so there was no way it could run Lisa software.) That meant Lisa and Macintosh could finally be united in what Sculley liked to call, with his marketers flourish, "the Apple thirty-two-bit supermicro family." But while the two machines might be moving forward toward compatibility, the teams responsible for them were not. The only way to make Sculley's strategy work was to combine them under one person.

The Choice was between Wayne Rosing, the former Digital Equipment engineer who'd taken over Lisa and Steve. Clearly it would have to be Steve. The only problem was that Steve didn't want Lisa anymore. All he cared about now was what was good for Macintosh. Lisa was somebody else's problem.

The day before Thanksgiving, at the regular Wednesday exec staff meeting, Wayne and Steve has a run-in. Nothing unusual about that. John suggested they take it up after the meeting. So one evening the following week, he and Steve and Wayne and Bob Belleville got together for dinner in the boardroom. Things got heated, especially after John brought up the idea of merging Lisa and Macintosh. Wayne didn't like the idea any better than Steve did; but as he put in some resistance, Steve came at him with his left hook, too many bozos, bam!, don't know what you're doing, chop!, whole thing's a failure, pow! That got Wayne upset, and pretty soon he was landing a couple of his own--you don't have any software, you're not going to have fifty programs in eight weeks, you're going to have nothing "Boys, boys!" John cried. "Calm down." But they wouldn't calm down; they kept at it for half an hour, until finally, after they'd thoroughly demonstrated their inability to work together, John simply stood up and announced what was going to happen: Steve was going to run a consolidated division; they were going to find something else for Wayne to do. That was it; end of discussion. The naughty miscreants promised to keep silent about what had just happened until Macintosh was introduced, and then they were sent home.

The next day, Steve started making calls. Whom should he get rid of? Was there anybody in the Lisa division who was worth a damn? Then Wayne told his staff what was going to happen, and by the end of the week word was out. To quell the rumors, Jay Elliot and his human-resources people persuaded Steve to make an announcement to the Lisa division, which consisted of about four hundred people, and explain what was going to happen. It was a move they'd soon regret.

By this time the Lisa division was ready to cave in with fear. The product wasn't working, Steve was out to get them, John had a reputation for ruthlessness, nobody else was able to defend them, they were about to be overrun by pirates. Steve wasn't in great shape either. He'd promised John a January introduction, and everything at Macintosh had gone into time-to-completion mode: three months to completion, two months to completion, seven weeks to completion, six weeks to completion.... Four years of work and dreams had been reduced to a final, desperate push. Everyone was frantic, trying to finish in time, to get rid of the bugs, to ship a machine that worked. The factory tour at tour at of August--the one they'd taken while Bob hiked to the top of Black Mountain had impressed on them all the hard dollars-and-cents reality of what they were doing. Macintosh wasn't just a fun thing they did every day in a nice building on Bandley Drive, it was a gamble with tens of millions of dollars of the company's money. The stockholders' money. Other people's money, out the window, on their dream. Now they had to deliver. The pressure was on, and it was on Steve more than anybody else. Macintosh was his baby. Macintosh was his vision. Everything he'd worked for was about to become real. He could barely sleep at night. He was blitzed. He was headed for overload. And now he had to absorb this crew of bozos?

.....

Page 264

Wayne's departure threw the II division even further into disarray, just as the chaos in Steve's camp was spilling out into public view. The situation was crystallized by the abrupt cancellation of the Macintosh XL, the refitted Lisa that was supposed to serve as the hard-disk machine for the Macintosh Office until they could re-engineer Mac itself to take a hard disk. Sales and engineering had sailed right past each other on that one. Bill Campbell wanted all the sales he could make; Bob Belleville was convinced they were losing money on every one. With Bob's encouragement, Steve had decided to build only as many as they had parts for. By the end of 1984, Lisa sales had dropped to just a few hundred a month, so it looked like they'd have plenty of parts to keep going until the Macintosh replacement was ready. But after the Macintosh Office introduction in January, with the machine repositioned as the Mac XL and the price cut to \$3,995, sales suddenly took off. New parts couldn't be ordered in time to maintain production, and Campbell was afraid that word of the parts snafu would leak out to dealers. So while Steve and Bob were in Japan, Apple announced that the machine was being discontinued.

There were signs about this time that the Mac Office strategy might actually be working. Federal Express had recently placed a \$5-million order, and orders of \$2 to \$3 million were coming in from companies like Honeywell, Motorola, and GTE. The sense of the industry, however, was that Macintosh would never really be accepted by corporate America until Apple delivered sophisticated business software and developed the networking capacity to tie Macintosh to the IBM world. Yet serious networking, like the FileServer, remained no more than a promise, and Lotus had just announced that jazz wouldn't be out until May, two months late. The Mac XL was one of the few components of the Macintosh Office that was actually in place, and now, only three months after its introduction, it was being suddenly and inexplicably canceled. "People were beginning to think that Apple had its act together," one puzzled analyst told the Journal. Now they had to think again.

The Beginning of the Macintosh Revolution The Big Mac Book

If you could have looked in on the group of 15 or so people who were in charge of creating the first Macintosh, you would have seen a mixture of young, committed, and passionate people who dreamed of creating a computer unlike any the world had seen.

In some ways, the Lisa computer was the prototype for the Mac and the beginning of that dream. The Mac was a vision for Jobs, and he saw it as the people's computer, not unlike the Volkswagen of the 50s and 60s, which was seen as transportation for the masses. The Lisa also was Apple's hope to capture a large portion of the business world's computer needs. The Lisa was a powerful \$10,000 computer, reviewed positively in the computer press. The first computers were shipped in April, 1983-with great expectations. The Lisa was much like the Macintosh-with terrific graphics and that now familiar, easy-to-use mouse.

Although what the Lisa was then was in part due to the hard and creative work of many people at Apple, ideas for the Lisa also stemmed from earlier research done at the Xerox Corporation's Palo Alto Research Center during the 1970s. There, computer engineers from all over the country developed the first computer with a graphical interface, which Jobs saw on a visit. The only problem was that, for whatever reason, the developers did not have the vision that Jobs had and the technology never really went anywhere. Some people left Xerox to work for Apple and to head up the Lisa project, and the bells and whistles developed at Xerox-most notably the mouse and the graphical interface slowly worked their way into the new Apple products.

The Lisa was a little slow, but what probably hurt sales most was the big price tag. Ten thousand dollars for the then unexplored world of personal computing applications caused many businesses to pull back. The result? Anticipated sales of 10,000 turned into actual sales of about 6,500, and the IBM PC (and the introduction of Lotus' best-selling 1-2-3 spreadsheet) started to take the business world by storm. The crest that Apple had been on for the preceding five years was beginning to fall. Apple had never been well established in the business community, and the battle looked like it would be even harder than anticipated, and indeed it was. Sales fell considerably; without the continued sales of the Apple II, there would not have been an Apple Computer, Inc.

The Lisa project, which Jobs originally wanted to direct, didn't go very well because of personal conflicts and vague management goals. The Macintosh project, however, which Jobs did direct, became an inspiration to everyone to produce a computer that could do much of what the Lisa was touted for but with less power and at a much lower cost. Jobs' intent, which probably led to the "computer for the rest of us" slogan, was to create something that everyone could afford and easily learn how to use-a computer with software that was user-friendly. This machine was to be the computer you could set up within 10 minutes after you took it out of the box and begin using in another 5 minutes. For most Mac users, these goals seem to have been met, although increasingly sophisticated and demanding (even for Mac) software can at times require more than the users intuition.

Macworld
THE LEGACY OF THE LISA
Larry Tesler
September 1985

On April 29 Apple announced that it would cease production of the Macintosh XL computer, formerly known as the Lisa. As a member of the group that helped create the Lisa, I couldn't help but feel a pang when I heard the news. Yet my overriding feeling is one of gratification. In its brief product cycle, the Lisa changed people's expectations of a personal computer. Among Apple products, the Lisa spawned not only the Macintosh but also the MouseText option on the Apple II (see "The Lisa's Influence"). Even IBM PC products were heavily influenced by the technology, including VisiCorp's Visi On, Microsoft Windows, Digital Research's GEM, Ashton Tate's Framework, and IBM's TopView.

The user interface was the most publicized characteristic of the Lisa. It introduced a host of ideas that have been widely emulated, ranging from how columns are widened in a spreadsheet to how people are notified of mistakes and problems. When the Lisa development team designed the user interface, we borrowed good ideas from wherever we could find them. For example, the Lisa borrowed pop-up menus and overlapping windows from Smalltalk, status lines from VisiCalc, and automatic removal of extra spaces after text deletion from Douglas Engelbart's research at SRI International.

But the Lisa user interface was not a copy of any that preceded it; it was distinctive. It was the first to feature the now familiar menu bar, the one button mouse, the Clipboard, and the trash can. Although the Xerox Star had icons, the Lisa was the first product to let you drag them with the mouse, open them by double clicking and watch them zoom into overlapping windows.

To minimize the time it would take people to learn to use the Lisa, Apple technical writers, programmers, and marketers struggled for two years to find suitable terminology to appear in menus, dialogs, alerts and manuals. Our foreign-language translators spent months choosing the corresponding terms in French, Italian, German, Spanish, and other languages.

It may come as a surprise that terms like Revert, Plain Text, Align Left, Clipboard, and Panel were difficult to coin and more difficult to agree upon. When we studied VisiCalc, we discovered that people had trouble interpreting the term General Format which means that a number typed into a spreadsheet cell is right justified, while text is left justified. After extensive brainstorming and testing of LisaCalc, we chose Words left, numbers right, which was self-explanatory if a bit verbose.

Much has been made of the high cost and five-year development time of the Lisa. True, the development was expensive, but it did not take five years. The first Lisa shipped in May 1983. Five years earlier, in 1978, Apple had announced a project code-named "Lisa," but that project's goal was quite different from what the Lisa eventually became. In early 1980, after Apple's senior staff visited Palo Alto Research Center (PARC) to see a demonstration of Smalltalk, the goal was completely redefined. Only the code name, some

hardware components, and a few of the staff members stayed the same.

I was the PARC employee who gave Apple the Smalltalk demonstration. Impressed by the perspicacity of the visiting Apple staff members, I resolved to join their company, which I did in July, 1980. Rich Page had just built the first Lisa prototype incorporating a sample 68000 microprocessor from Motorola. Apple's small but energetic Lisa development team was debating the relative merits of one, two, and three-button mice. No software had been designed except a tiny prototype of LisaWrite written on an Apple II. Some thought had been given to the user interface, but there was no menu bar, no icons, and only one scroll bar on the left side of each window.

In the summer of 1980, a group headed by Bill Atkinson and myself defined the ground rules of the user interface. Today those rules are familiar to anyone who uses a Macintosh or a Lisa. Bill prototyped pull-down menus and a one-button mouse, along with alternatives to this scheme. I had a number of people use the prototypes to compare the relative merits of those designs.

That autumn Bruce Daniels hired most of the Software Group. Although the majority had never seen a mouse before, they plunged into the design of the operating system, the Window manager, QuickDraw, LisaCalc, LisaDraw, LisaGraph, LisaList, and the Desktop Manager (Finder).

As manager of the 20-person Applications Software Group, I was pressured constantly for schedules and priorities. My associate, Peggy Stanford, tried a number of project scheduling programs, but none were satisfactory. One day, at a meeting of my staff, I described my dream scheduling system. Steve Young mentioned the concept to his wife, Debbie Willrett. She promptly quit her job at another computer company and in a few incredible weeks created the first prototype of Lisa Project. We relied heavily on that program throughout the remainder of the development period. The marketing department was impressed by its utility and decided to make it a product.

One story that was exaggerated in books and articles was the tension between the Lisa and Macintosh teams. As in any friendly rivalry, some individuals took the competition too seriously. By and large, the teams gave each other both moral and technical support. Half the Macintosh programmers came from the Lisa group, and most of those were working on both Lisa and Macintosh tasks at the same time. We were saddened when the merger of our divisions forced the elimination of many duplicate jobs, but most displaced employees found positions elsewhere in the company, and the rest discovered that Lisa developers are well-regarded in Silicon Valley.

Newspapers and magazines like to feature stars, as a result a few members of the Lisa team received the lion's share of the publicity and credit for the product. Everyone who worked on the Lisa knows that it was a team endeavor. My most lasting memory will be of how much everybody cared about the quality of the product. Every 80-hour workweek, every canceled vacation, every hot debate, and every wrenching management decision was motivated by one common driving force: we wanted our product to be the best.

By my reckoning the Lisa engineering effort took three years from product definition and first prototype to full production. In the end we had produced the first multitasking windowing system for a personal computer. In my opinion the Lisa Office System still outclasses its IBM PC imitators more than two years after its first public demonstration.

I am sure that every former member of the Lisa Development Team is proud of our accomplishment. We put our hearts, minds and lives into fulfilling a dream. Its role in the product line will be filled by the 512K Mac and a 20 megabyte hard disk and integrated applications. The Lisa manufacturing line may be closed, but the accomplishment lives on in the lower-cost, higher-performance Macintosh.

The Lisa's influence

The Lisa affected the design of many personal computers. Listed here are Lisa innovations that were incorporated into the Macintosh.

Hardware

- Mouse design
- Imagewriter printer

User Interface

- Menu bar, pull-down menus, keyboard activated menu commands
- Printing dialog boxes
- Appearance, structure, and operations of windows and scroll bars
- Ability to move windows and icons by dragging them with the mouse
- Windows that zoom to open and close

Individual Software Packages

- Quickdraw graphics are identical in the Lisa and Macintosh
- LisaProject was converted for Macintosh to become MacProject
- LisaDraw was converted for Macintosh to become MacDraw
- LisaTerminal, LisaWrite, LisaCalc, LisaGraph, and LisaList influenced the design of Macintosh applications.
- The Lisa Desktop manager influenced the design of the Macintosh Finder
- The Lisa printing software heavily influenced the Macintosh printer driver equivalent
- Lisa Pascal is still the principal language used to develop software for the Macintosh.

CHAPTER TWO

REPAIRS & MAINTENANCE

Because of its age, your Lisa/Mac XL may require repairing. The only commercially available current source for repair tips is contained in the book *Macintosh Repair & Upgrade Secrets*, written by Larry Pina and published by Hayden Books.

The book covers repair tips for all Macintosh models from the original Macintosh (the 128K) through the Macintosh SE, as well as a chapter devoted to the Lisa/Mac XL. Due to the modular nature of the Lisa/Mac XL, replacement of defective parts is very easy. The book will help you disassemble your Lisa/Mac XL as well as help pinpoint what the error messages mean.

The Book also provides detailed instructions for fixing disk drive problems and installing the video screen fix kit. The screen kit instructions are most helpful, since the screen kit was sold by Apple without instructions (designed to limit installation to dealer technicians). *Macintosh Repair & Upgrade Secrets* also includes information on the secret built-in service mode for the Lisa/Mac XL.

The Lisa/Mac XL's chapter in *Macintosh Repair & Upgrade Secrets* contains the following sections:

Lisa/Macintosh XL Repair Secrets

Identifying the Models

Lisa /XL Disassembly Procedure

Automatic Startup Tests

ROM Checksum

MMU Register Test

Memory Sizing

Preliminary Memory Test

VIA Test

I/O Board Tests

ROM Identification

Booting the Operating System

Built-in Service Mode

Summary of the Diagnostics Routines

Mechanical Problems with the 3.5 Inch Disk Drive

Drive Makes Eject Noises but Disks Fail to Eject

Drive Does Not Make Eject Noises and Disks Get Stuck

Grinding Noises

Hard Drive Repairs

Startup Error 81

Startup Error 84

Sad Mac Error Code 0F0064

MacWorks Plus

What It Does
 Miscellaneous MacWorks Plus Information
 800K Disk Drive Upgrade
 Internal Hard Drive Upgrades
 Noisy Hard Drives
 Expansion Card Upgrades
 Memory Upgrades
 Video Upgrades-External Monitors
 Video Upgrades-Internal Monitor Macintosh XL Screen Kit
 Summary

If your Lisa/Mac XL is ill, the built-in start-up routine will present an error code, which can help diagnose the machines ills. The error codes for the Lisa/Mac XL are as follows:

Code	Icon	Symptom	Solution (from Larry Pina's Book)
N/A	Drive opening	No diskette	Insert disk
23	Diskette	Unreadable diskette	Reformat disk
38	Diskette	No startup file on diskette	Install system
39	Diskette	Drive ROM can't keep up	Wrong drive ROM
40	CPU card	Memory management problem	
41	CPU card	Selection logic problem	CPU card missing
42	CPU card	Video circuit problem	
43	CPU card	Parity circuit problem	
44	Lisa	Unexpected NMI interrupt	
45	Lisa	Bus error	
46	Lisa	Address error	
47	Lisa	Unexpected exception	
48	Lisa	Illegal instruction	
49	Lisa	Line 1010 or 1111 trap	
50	I/O board	Keyboard VIA error	6522A chip?
51	I/O board	Parallel VIA error	6522A chip?
52	I/O board	I/O COPS error	COPS chip?
53	I/O board	Keyboard COPS error	COPS chip?
54	I/O board	Clock error	
55	I/O board	Serial port A problem	Z8530 chip?
56	I/O board	Serial port B problem	Z8530 chip?
57	I/O board	Disk controller problem	Lite Adapter?
58	I/O board	I/O board access error	
59	I/O board	I/O COPS error	
60	I/O board	I/O or keyboard error	
70	Memory board	Read/write error	
71	Memory board	Parity error	
75	Internal HD	System files are damaged	Reinstall System

75	External HD	System files are damaged	Reinstall System
75	Floppy disk	System files are damaged	Reinstall System
75	Expansion card	System files are damaged	Reinstall System
80	Internal HD	Drive cable is disconnected	Check cable
80	External HD	Drive cable is disconnected	Check cable
81	Internal HD	No response from drive	Adjust solenoid?
81	External HD	No response from drive	
82	Internal HD	Drive doesn't answer	
82	External HD	Drive doesn't answer	
83	Internal HD	Other drive problem	
83	External HD	Other drive problem	
84	Internal HD	Boot blocks are damaged	Low level format?
84	External HD	Boot blocks are damaged	Low level format?
85	Internal HD	Drive can't keep up	
85	External HD	Drive can't keep up	
90	Expansion card	No card in that slot	
91	Expansion card	Can't start from that card	
92	Expansion card	Problem with the card ROM	
93	Expansion card	Other card problem	

For those who have a strong background in hardware and intend to hack around with their Lisa/Mac XL, the following information regarding errors in the Lisa Hardware Manual may be of help.

MACINTOSH XL HARDWARE INFORMATION

Written by: Mark Baumwell 16 May 1985

This document covers Macintosh XL information that is either incorrectly documented or not documented elsewhere in the Lisa Hardware Manual.

I/O Space Addresses

The Lisa Hardware Manual shows incorrect addresses for locations in the I/O space such as the expansion slots, floppy disk controller, serial ports, parallel ports, keyboard/mouse control, etc. The addresses are listed as 00xxxx in the manual, but should be FCxxxx. As an example, refer to Figure 2-5 (System I/O Space Overview) in the Lisa Hardware Manual. The correct addresses for the expansion slots are (all in hexadecimal):

<u>Addresses</u>	<u>Function</u>
FC0000 - FC1FFF	Expansion slot #1 Low Decode
FC2000 - FC3FFF	Expansion slot #1 High Decode
FC4000 - FC5FFF	Expansion slot #2 Low Decode
FC6000 - FC7FFF	Expansion slot #2 High Decode
FC8000 - FC9FFF	Expansion slot #3 Low Decode

FCC000 - FCBFFF

Expansion slot #3 High Decode

Also note that while the I/O space addresses are in the range FCxxxx, the Boot ROM addresses are in the range FExxxx.

Reading the Boot ROM version number:

To check the version number of the Boot ROM, display location FE3FFC for 4 bytes. If you display it from LisaBug, the display looks something like this:

```
00FE3FFC 0248
```

The version number is 0248, or 2.48. Note that 48 hex = ASCII H. Therefore the ROM revision is H. Note the Boot ROM version number and the Floppy ROM version number are displayed in the upper right hand corner of the Macintosh XL screen during the self test. For example if H/88 was displayed on the screen during the self test, the Boot ROM is revision H and the Floppy ROM version is 88.

Reading Parallel Interface Card ROM Version Numbers:

Note that if a Parallel Interface Card is installed, you can check its ROM version number by adding FF8 to the start of the Low Decode address of the slot the card is in and then displaying the resulting 4 bytes. To interpret the version number, look at the low order byte of each word. For example, to check the ROM version number of a Parallel Interface Card in slot 2, display location FC4FF8 for 4 bytes. If you display it from LisaBug, the display looks something like this:

```
00FC4FF8 0001 0007
```

Since the ROM is on the lower half of the data bus, the upper half of the data bus should not be interpreted. Therefore, the version number is 0107, or 1.07.

Parallel Interface Card VIA Offsets:

Each Parallel Interface Card has two 6522 Versatile Interface Adapters (VIAs), one for each parallel port. The address of the VIAs are found by adding constants to the expansion slot decodes as described below.

Add 2000 hex to the slot low decode to get the lower VIA base address. Add 2800 hex to the slot low decode to get the upper VIA base address.

For example:

FC2000 is the slot 1 lower VIA base address.
FC2800 is the slot 1 upper VIA base address.

Internal VIA locations:

There are two VIAs on the Macintosh XL I/O board. The first VIA (VIA1) is controlled by a COPS processor and is connected to the mouse, keyboard, and other peripherals. The second VIA (VIA2) controls the built-in parallel port. The VIA locations and offsets to their registers and timers are as follows:

```
VIA1BASE      .EQU          $FCDD81    ;Base address - offsets follow
ORB1          .EQU $0          ;Port B output register
ORA1          .EQU $2          ;Port A output register
DDRB1        .EQU $4          ;Port B Data Direction register
DDRA1        .EQU $6          ;Port A Data Direction register
T1LL1        .EQU $C          ;Low Order T1 Latch
T1LH1        .EQU          $E          ;High Order T1 Latch
T2CL1        .EQU $10         ;Low Order T2 Counter
T2CH1        .EQU $12         ;Low Order T2 Counter
VIA2BASE     .EQU $FCD901     ;Base address - offsets follow
ORB2          .EQU $0          ;Port B output register
IRB2          .EQU $0          ;Port B input register
ORA2          .EQU $8          ;Port A output register
IRA2          .EQU $8          ;Port A input register
DDRB2        .EQU $10         ;Port B Data Direction register
DDRA2        .EQU $18         ;Port A Data Direction register
T1LL2        .EQU $30         ;Low Order T1 Latch
T1LH2        .EQU $38         ;High Order T1 Latch
T2CL2        .EQU $40         ;Low Order T2 Counter
T2CH2        .EQU $48         ;Low Order T2 Counter
```

The Lisa 2 Hardware Manual provides the following rules for start-up tests. I have included this information for those who have a Lisa 2 but do not have the manuals.

Appendix 3

Automatic Startup Tests

Every time you turn the Lisa on, the system runs a series of tests to verify that startup can proceed. This appendix describes the tests in the order in which they are run and provides a table explaining the detailed error messages generated by the tests.

STARTUP TEST SEQUENCE

If everything is working correctly during startup, the tests proceed in the following sequence.

ROM Checksum

This test computes a 16-bit checksum of the entire ROM to check its validity. If the checksum is successful, the system passes on to the next test.

If the system fails the ROM checksum, the system hangs. The screen may be blank, or it may display a random pattern at a very bright contrast level.

MMU Register Test

This is a read/ write and address test of the static RAMs in the memory management unit. Successful completion is followed by the next test.

An early failure causes the test to repeat indefinitely, with a blank display on the screen.

If this test reaches its final stages and then encounters a failure, the screen displays the CPU board icon, with error code 40.

Memory Sizing

This test determines the amount of memory in your system to facilitate further testing. If an error is found, the error is saved but testing continues. If memory cannot be accessed at all, the speaker beeps once with a low tone and the system hangs with a series of vertical lines on the screen.

Preliminary Memory Test

Next the system tests the first 2048 bytes of memory to ensure that some memory is available for use by the startup ROM. If an error occurs, the Lisa sounds the speaker twice and then hangs in a test loop, with a random display on the screen.

VIA Test

This test verifies that the I/O board can be accessed. Failure results in the appearance of either the I/O board icon, with error code 58, or the CPU board icon, with error code 41.

If this test proceeds without problems, the Lisa turns the screen contrast all the way down.

Screen Memory Test

This test facilitates the reporting of errors that are found during other tests. Errors do not interrupt the tests but are reported at the end of startup as a memory failure.

I/O Board Tests

The contrast is set to midrange, and the keyboard and mouse connections are checked. If either the keyboard or the mouse is not connected, the Lisa alerts you to the situation at the end of the startup sequence. If those tests proceed normally, a click is emitted from the speaker. This click tells you that all tests up to this point have been executed and that the keyboard is ready to accept alternative startup device commands.

From this point, the screen displays a series of icons showing which test is in progress.

While a board is being tested, its icon is highlighted on the screen. As each board passes the tests, the Lisa displays a check mark over the icon. Usually, the video screen has not had time to warm up at this point, so you may not see this display.

Errors detected during the following tests are reported both by a screen message and by a two- or three-note error tone.

CPU Board Test Completion

The remaining two CPU board tests partially check the video circuitry and record wrong parity circuitry. If either test fails, testing is terminated, and the CPU board icon is displayed with one of two error codes:

42 Video logic error

43 Parity logic error

Memory Test

The final memory check is a full read and write and address check of all RAM not yet tested. The brief test takes about 18 seconds for a full megabyte of memory. If you have specified a thorough test in your startup specifications, the test takes twice as long.

Errors detected in this test are displayed at the end of the startup sequence. The memory board icon with error code 70 indicates read/write errors, and the memory board icon with error code 71 indicates parity errors.

I/O Board Test Completion

This test verifies that the disk controller is ready, checks shared memory, and then disables the disk interrupts until startup is complete. Errors are displayed as an I/O board icon with error code 57.

The Lisa then tests the serial port controller. Errors are displayed as an I/O board icon, with error code 55 for port A errors and error code 56 for port B errors.

After these tests, the speaker emits a double click and the Lisa scans the keyboard for any keystrokes entered since the first click. The Lisa then reads the clock/calendar and saves the time and date information for later use.

Errors in reading the keyboard or the clock are displayed as an I/O board icon, with error code 52 for the I/O board COPS, which controls the keyboard and mouse interfaces, or with error code 54 for the clock/calendar.

Expansion Slot Configuration Check

Finally, the system scans each expansion slot to see if a card is present. The results are

stored for future use but are not compared with the information in parameter memory.

If this check uncovers a bootable device in any slot, the Lisa scans the required ROM on the card to ensure that it can be read properly. An error here is displayed as an expansion card icon, with error code 92.

STARTUP ERROR MESSAGES AND TONES

Each startup error message can consist of three parts:

- * An icon representing the module that caused the problem.
- * A numeric code indicating the kind of problem.
- * A one-, two-, or three-note error tone indicating either which module caused the problem or what kind of problem it is.

Some of the error messages indicate a physical problem with the Lisa; others indicate a problem with the system setup. In general, the presence of an icon with or without a numeric code means that the module represented by the icon should be checked or replaced.

Service Mode Information

If the boot time diagnostics on the Lisa detect what appears to be a hardware problem, they display a screen with an “Xed” out Icon and a 2 digit error code. It also displays three options which may be chosen by mouse click or by typing “Apple” #. They are: 1. Restart (cycle power and start over) 2. Continue (ignore it and hope it will go away) 3. Startup from... (show the ‘Startup from’.... screen). The Startup error messages are documented in Appendix B of the Lisa 2 Owners guide. The accompanying beeps are listed in chapter 2. Anyway, if you type ‘Apple’ S instead of a number, you will get something called “service mode” which appears to be a primitive debugger. You can read and write memory, jump to a location and begin execution, loop on one of the ROM tests, and of course exit. What follows is a rather disjointed list of what I’ve learned about this mode so far. Additions and corrections are solicited.

1. The only entry point I’ve found is the “It’s broken” screen.
2. the MMU ___may___ be in use: When I get there via a Mem 2 error 70 Ram is mapped from 0 to 1 Meg with the boot ROM superposed on locations 0 to N k.
3. There’s more hidden waiting to be found.

(Larry Pina’s book also has some information on the Service Mode. This is apparently for internal testing purposes only. Use with extreme care as some options may cause data loss. The Service Mode is an undocumented feature which is included in the Lisa’s rom.)

Repairing a Noisy Profile Drive

This is a fix for a nasty sounding rattle that some 5mb profiles make. It worked like a charm for me. One of my drives was making a racket that was intolerable, and now it is as quiet as any I have heard.

The main problem was a Copper spring on the hub bearing. You have to remove the case. You don't need to remove all the rear screws. Slide the case up, be careful of the IN USE LED. Unplug the power and signal cables. I think there are 4 screws that hold the drive to the case. They are on the bottom. Remove the analog card. You should see the 'Spring' at the fly wheel. I think that it is held in place with a hex screw. Adjust this. There really isn't any guidance, like a feeler gauge, loosen it, attach the cables, power up and listen, repeat until quiet or quieter. If it does not help, the bearings on the inside could have dried up, you will have to live with it (sorry) or back-up and replace it.

Dare to Upgrade

This file describes how one may connect appropriate drives to the various parallel ports on a Lisa computer. Use this information at your own risk.

Connecting a Widget-10 as an external drive: J1, the I/O connector, is connected via a ribbon cable straight to a DB-25M with the pin 1's aligned. Use a 25 conductor ribbon cable, a few feet works fine. Connect one end to an IDC DB-25M after removing the polarizing pin (pin 7). Connect the other end to a female 26 pin IDC header justified to pin 1 (pin 26 is left unconnected).

J2, the power connector is allocated as follows:

pin	voltage	current
1	+5V	350 mA
2	+12V (clean)	150/100 mA
3	drive sense output (5.1k to +5)	
4	GND (clean)	
5	+12V (fan + motor)	350/100 mA + fan
6	GND (fan + motor)	
7	(NC)	
8	-12V	100 mA

Where two current figures are specified, the larger is the starting current (a few seconds duration), the smaller is the running current. It is okay to connect the two +12V pins to one supply. As the current requirements are remarkably low for a hard disk, almost any power supply for an external disk like those in PC expansion enclosures will power the drive easily. Be careful to get one that can supply -12V. With a power supply and drive in one box, a fan is required.

Connecting a Profile or other external drive to the internal port: This is slightly more bothersome than connecting a Widget externally. The internal parallel port on the Lisa 2/10 is almost identical to the others. To connect a DB-25 cable, you can crimp a ribbon cable IDC female DB-25 into the cable by modifying the cable as follows: Identify the first conductor in the cable marked by a red stripe and/or an arrow or extra slot on the connector. Sometimes these things are put together backwards, so the connector orientation is most reliable. The following conductor numbers apply to the ribbon cable,

NOT the DB-25 connector pin numbers. Centered on where you are to crimp on the additional connector (about 3 inches from the HD end); Separate the last conductor (number 26) from the others enough (about 3 inches) to get it outside the DB25, it is not used for this connector. Separate conductors 24 and 25 for about 2 inches. Separate conductors 21 and 22 for about 2 inches. Find pin 1 of your DB-25 socket, and set it up by pin 1 of the cable. Rotate the group of three conductors 22,23,24 a half twist so that the positions of 24 and 22 are reversed, and (carefully) crimp the sucker together. This moves the OCD line on conductor 24 from pin 25 of the DB-25 (CHK) to pin 24 of the DB-25 (GND).

Cable Pinout for External Hard Drive

Below is the pinout for a cable that will allow a Profile to be kludged onto a Lisa 2/10 or Mac XL whose internal HD has died. Definitely a second choice, but... I used an OK industries breakout connector, but two regular headers on a piece of vectorboard would be neater. I'm afraid I have no better suggestions than punching a hole in the cabinet to get the cable out. Lisa 2/10 internal HD to ProFile adapter cable pinout

Flat cable	DB25S	Signal
1	-	+5
2	1	Gnd
3	2	GND
4	15	PSTRB/
5	3	R/W
6	16	BUSY/
7	4	GND
8	17	CMD
9	5	D0
10	18	PARITY
11	6	D1
12	10	GND
13	-	NC
14	14	GND
15	8	D2
16	21	CRES/
17	20	GND
18	22	D3
19	24	GND
20	23	D4
21	11	D5
22	9	GND
23	12	D6
24	Connect to flat cable 26	OCD (Open Cable Detect)
25	13	D7
26	Connect to flat	24 GND

cable

This file describes how one may connect appropriate drives to the various parallel ports on a Lisa computer. I'll be happy to clarify anything you think is confusing, but if you want pictures, you should probably get some help. Use this information at your own risk.

Apple Lisa Memory card pinout

/ indicates low active signal, "x,y" indicate arbitrary numeric subscript that I didn't care to guess. Where possible signal names were taken from the Lisa Hardware Manual.

1. NC
2. NC
3. GND
4. GND
5. UDS/
6. LDS/
7. Video Cycle/
8. VAx
9. NC
10. VAy
11. Data
12. Data
13. Data
14. Data
15. Data
16. Data
17. Data
18. Data
19. Data
20. Data
21. Data
22. Data
23. Data
24. Data
25. Data
26. Data
27. GND
28. Gnd
29. Vcc
30. Vcc
31. RA1
32. RA2
33. RA3
34. RA4
35. RA5
36. RA6

37. RA7
38. RA8
39. Slot
40. NC
41. Axx
42. Ayy
43. A20
44. Dotclk
45. Write/
46. CAS/
47. RAS/
48. A19
49. HDERR(?)
50. NC
51. NC
52. GND
53. NC
54. GND
55. NC
56. Pullup(?)
57. GND
58. GND
59. Vcc
60. Vcc

How to Disassemble a Profile Disk Drive (by someone who took it apart upside down)

Disconnect the power and interface cables from the Profile. I would even suggest waiting a few minutes before starting to disassemble the Profile. Some power supplies need time to leak stored current away.

Caution: The disk drive is a delicate instrument. Handle the Profile carefully. You may want to work over a padded surface. Another good precaution is to wash your hands so that you'll be less likely to have it slip from your hands.

Turn your Profile upside down. Take out the 3 screws along the front of the Profile. Turn it right side up. Look at the back of your Profile. Take out the 4 screws. These hold the back plates onto the cover. You can now take off the cover carefully. There's a cable that snakes along the inside top of the cover that connects a disk drive board to the light in the front of the Profile, so don't take it all the way off. Lift the cover up a bit and tilt it so the back comes free. Once the back is free, you can move the cover towards the front so that the retainer tabs on the cover don't get stuck on the circuit boards. Holding the cover up, disconnect the front light connector from the circuit board in the Profile. It's the only cable connected to the cover.

You can now lift the cover off. What you see now is the power supply on the left with the

Profile controller board on top of it. On the right, you see the Seagate hard disk drive (an ST506 for a 5 Meg Profile, who knows what for a 10Meg) with 2 boards underneath it. The higher board is the Motor Control Board. It makes sure the disk turns at the appropriate speed. The lower card is the analog electronics card. At this point, you can remove the 2 back panels that are behind the disk drive and the power supply. Now you'll want to remove the long back panel. Unscrew the 4 screws holding it to the power supply, then the 2 screws on the bottom of the Profile behind the disk drive. Lift the panel out carefully. The retainer in the panel between the drive and the power supply may get stuck on some of the wires. Just move the wires out of the way and maneuver the panel out. Whew! Take a break if your hands are sweating. OK! Time to get the drive and supply out of the case!

First, let's get the Profile controller board loose (the one on top of the power supply). It's held to the supply by one screw and 5 plastic connectors. Just undo the screw and one by one, squeeze the plastic "pins" and pull the board from them. Don't forget the one in the middle of the board! Once the board is free, disconnect the gray ribbon cable and the molex connector. When putting the Profile back together again, remember that the red side of the ribbon cable should be on the front side of the drive. The molex should only go in one way, but just in case, the black wire should be towards the front, the red wire towards the rear. The controller card is now free to be removed. The last connector left is in mid-air, kind of like the type you see all over the place under the dash of your car. Pull it apart. This was kind of tough for me. The mid-air connector is keyed so you can't put it together wrong. Just in case, the two black wires of the connectors should be connected. This severs the connection between the drive and the power supply.

Now turn your Profile upside down so that it's resting on the disk drive itself. Put some padding down underneath the drive so that you have some protection in case it slips from your hands. Under where the drive is (or on top since the case is upside down now), there are 4 screws that are recessed into the case. Unscrew these. Don't undo the two that lie flush with the case! Now lift the supply/case off and Voila! There's the drive! Set aside the drive (carefully) and do the same routine for the power supply. Turn the case upside down, undo the 4 screws, and now the power supply is free.

*** Congratulations! You just disassembled your Profile! ***

To put it back together, just reverse the steps! Remember that the switch and power cord connector for the Profile face to the back of the case. Also the round part of the drive faces the back of the case.

Start-up Instructions

If you just adopted a Lisa/Mac XL and somehow did not receive any documentation you may be frustrated by your inability to get her started. The following excerpt has some useful tips from a Lisa/Mac XL user.

"LISA (MAC XL) STARTUP I have a Lisa 2/10 and am running 7/7, Pascal Workshop, and MacWorks from it. I think I have finally got it figured out. Just after you turn the machine on or push the reset button, push in your MacWorks disk. In just a couple seconds you'll

hear a very soft click. Hold down the “Apple button” and push the 2. Meanwhile the diagnostics are going on. At the end of them, there’s a very loud click. At that point, if you did things properly, the floppy will start to go and you’ll go into MacWorks. If you touch any other key or accidentally press the 2 before holding down the Apple key, you’ll be presented with the ‘boot from’ choice in the upper left hand of the screen. Choose 2 and off you go to MacWorks. If you’re just plain lazy, just hit any key before that loud click is heard and then choose from the box. There was a version 2.0 MacWorks that was in December’s software supplement that was a pre-release and boots directly from the hard disk if you have moved the system files to the hard disk. If your MacWorks disk gets ejected and then you get a loud long beep and a flashing disk icon, you have version 1.x MacWorks. You then have to insert a system disk to boot off of and run the Hard Disk Install the first time. If your smiling Mac comes up and you go directly to the desktop, you have a properly installed version 2.x MacWorks. If you get a profile icon with a question mark in it that turns into a disk icon with a question mark, you have an improperly installed version 2.x MacWorks (no system folder found on the hard disk). If you have a version 2.x MacWorks and don’t want to boot from the hard disk, hold down the “Apple” & “option” keys during the whole time it’s reading the MacWorks disk, you’ll get the profile icon with a flashing question mark that quickly turns to a disk icon. Make sure that you use the preferences tool in 7/7 to set up all your ports, drivers, etc. That turned out to be the biggest of my mistakes. PS: The “Welcome to Macintosh” is centered in version 2.x of MacWorks, and offset to the middle of a normal Mac screen (high and left) in version 1.x.

The No Icon Blues

Every once in a while, some of us trash something on our hard disks and when we boot off a floppy (oops, this is all for MacWorks users), the hard disk icon gets shy and doesn’t appear on the Desktop. What to do?

Run Apple’s HDInstall. When it gets to the point where it asks you to Initialize the disk, say NO, then quit. The icon should show on the Desktop. Many thanks to Tim Rand for reminding us all about this (I’d though I’d recovered that way once, but wasn’t sure).

An interesting item gleaned from the magazine LisaTalk Report may give a bit of insight as to why some people get this problem regularly while others only get it after some incredibly gross programming mistake (Who, me?). Herb Kroemer reported it may be due to a bad Macworks distribution disk. If you have a friend who doesn’t seem to get the disappearing icon problem as much as you, use Bill Cook’s XLDiskCopy program here in DL9 to make a copy of it for yourself and see if the problem goes away.

CHAPTER THREE

PARTS & UPGRADES

The two main providers for Lisa/Mac XL support are Sun Remarketing and Dafax Processing Corp. In 1985 Apple discontinued the Lisa/Mac XL in favor of its modular line of Macintosh Computers. At that time, Apple had over 7,000 Mac XL's in its warehouses which Apple sold to Sun Remarketing in 1986. As a part of the deal, Sun retained the right to use the source code for the apple roms which control the basic functions of the Macintosh.

Sun went on to develop numerous products for the Lisa/Mac XL which continue to keep the machine viable. Dafax began supporting the Lisa/Mac XL in 1985, and is a licensee of Sun products.

In the future it looks like Dafax will be the number one supporter for the Lisa/Mac XL. They are currently working with Query Engineering to develop MacWorks Plus II which will allow the Lisa/Mac XL to run the latest Apple system software (System 6.0.7 at present, System 7.0.1 at a later date). Catalogs are available from both Dafax and Sun. The current price and product lists are as follows, subject to change without notice (Summer 1992):

Dafax Processing Corp.
14 North Drive
Malba N-Y 11357
1-800 323-1751

DAFAX SUMMER 1992 LISA/MAC XL PRICE LIST

DESCRIPTION TYPE	PART#	PRICE	S&H
OPERATING SYSTEMS:			
MacWorks Plus II Basic	MW-02	\$179.00	\$6.00
MacWorks Plus II PRO*	MW-03	\$249.00	\$6.00
MacWorks Plus II PRO with Series 1 Updates**	MW-04	\$279.00	\$6.00
MW+II PRO with Series 1 Updates 5-PACK**	MW-05	\$1275.00	\$15.00
MacWorks Plus II Basic to PRO Upgrade	UPG-1	\$120.00	\$6.00
PRO to Series I Update (\$120 Core Charge)	UPG-2	\$50.00	\$6.00
MacWorks Plus	MW-01	\$99.00	\$4.00

400K VERSIONS SPECIFY

-ADD 400K to Part -400K

*PRO version ships with PFG to support PRO version with Basic software - PRO software

ships when completed.

**PRO version with Series 1 Updates ships as above, but includes software updates as released.

LISA/MAC XL UPGRADES:

16Mhz Basic XLerator	BCXL-16	\$695.00	\$9.00
16Mhz XLerator with Faster SCSI Package	SCXL-16	\$795.00	\$9.00
16Mhz XLerator with Faster SCSI & FPU Socket	FPXL-16	\$895.00	\$9.00
80ns Zero-wait-state RAM for above in 2Mb increments, Installed & Tested - per Megabyte*	RAM-1	\$50.00	incl.
68881 16Mhz FPU Math Co-Processor -ADD	FPU-1	\$100.00	incl.
68882 32Mhz Installed & Tested -ADD	FPU-2	\$250.00	incl.
Lisa 2Mb Memory Card (with 1.5Mb installed)*	L2MN	\$249.00	\$5.00
Lisa SCSI Card	SCSI-I	\$99.00	\$6.00
Lisa SCSI Accessories Card (LSAC)	LSAC-1	\$249.00	\$9.00
800K Internal Replace Drive includes MW+ (Lisa)	RFLA8-1	\$200.00	\$6.00
800K Internal Replace Drive includes MW+ (XL)	RFX88-1	\$200.00	\$6.00
52Mb Quantum 9ms Int'l SCSI Hard Disk Kit**	SCSI-52	\$349.00	\$16.00
105Mb Quantum 9ms Int'l SCSI hard Disk Kit**	SCSI-105	\$469.00	\$16.00
240Mb Quantum 10ms Int'l SCSI Hard Disk Kit**	SCSI-240	\$829.00	\$16.00
External Drives zero- footprint or compact ADD	EXT-1	\$90.00	\$5.00
Internal SCSI Mounting Kit with front panel LED	MTG-11	\$79.00	\$6.00

MEMORY SPECIALS: Purchase the XLerator with 4Mb of RAM, and the PRO version of MacWorks Plus II and get the 4Mb of RAM installed and tested on your XLerator for only \$140, a saving of \$60. The Lisa 2Mb Memory Card is now only \$249, a saving of \$50 off the regular price.

LISA/MAC XL PARTS:

Screen Fix Kit - for square Pixels (3A ROMS)	SFK	\$79.00	\$6.00
---	-----	---------	--------

ROMSwitcher -allows use of both H & 3A ROMS	RMS-1	\$179.00	\$6.00
1.8 Amp Power Supply for Lisa or XL (Exchange)	PS-1.8	\$195.00	\$9.00
1.2 Amp Power Supply for Lisa 2 only (Exchange)	PS-1.2	\$145.00	\$9.00
X/Lisa Video Card (Exchange)	VC-I	\$145.00	\$6.00
X/Lisa Video Card HQ (High Quality) (Exchange)	HQVC-1	\$179.00	\$6.00
Lisa/XL CPU Board (Exchange)	CPU-L	\$145.00	\$9.00
Lisa 2 - I/O Board (400K) (Exchange)	IOL-1	\$145.00	\$9.00
XL/Lisa 2/10 - I/O Board (400K) (Exchange)	IOX-1	\$145.00	\$9.00
X/Lisa Motherboard - specify Lisa or XL (Exch)	MB-1	\$195.00	\$9.00
X/Lisa CRT Replacement	CRT-1	\$120.00	\$16.00
X/Lisa 512k Memory Board (NEW)	512K-1	\$79.00	\$9.00
X/Lisa Parallel Card	PAR-1	\$99.00	\$9.00
AppleTalk/LocalTalk/PhoneNet Lisa Lisa Mac XL Kits	AT-3	\$49.00	\$6.00
DIN 8 to DB 25 Converter - Grappler/DeskWriter	DW825	\$49.00	\$4.00
X/Lisa Keyboard Replacement (NEW)*	KBD-1	\$75.00	\$9.00
X/Lisa Mouse Replacement (Exchange)	MSE-1	\$90.00	\$6.00
*NEW KEYBOARD SPECIAL while they last	KBD-S	\$39.00	\$9.00
Core Charge on EXCHANGE Items		\$50.00	

Sun Remarketing
P.O. BOX 4059
Logan, Utah 84321
1-800-821-3221

Macintosh XL: The Macintosh XL system comes with the original Apple configuration -- 10mb internal hard drive and 400K internal floppy. \$495.00 (\$54 S&H) 101-140.

Macintosh XL/800K: Same as Macintosh XL system only it includes the Sun Remarketing 800K floppy upgrade, SMK, SCSI. \$595.00 (\$54 S&H) 101-181.

Lisa/800K Floppy: Once MacWorks Plus is loaded in this Lisa, you'll have full use of your 800K floppy and be able to load systems and programs. Other features same as above. \$345.00 (\$54 S&H) 100-181.

Lisa: Complete with 1 mb ram, 800K Floppy, & 20/40 Mb SCSI. 20 Mb SCSI System \$595.00 (\$54 S&H) 100-283, 40 Mb SCSI System \$795.00.

Lisa SCSI Drives: Includes MacWorks Plus and SCSI Card SCSI 20 \$295.00 (\$15 S&H) 501-201, SCSI 40 \$395.00 (\$15 S&H) 501-401.

800K Internal: Includes MacWorks Plus (Specify Lisa or Mac XL) \$200.00 (\$5.47 S&H) 500-800.

2 Meg Upgrade: \$249.00 (\$5.00 S&H) 200-120.

Lisa SCSI Card: \$99.00 (\$5.00 S&H) 200-300.

MacWorks Plus: 800K Version \$99.00 (\$4.00 S&H) 402-108, 400K \$99.00 (\$4.00 S&H) 402-200.

There has been little press coverage for the Lisa/Mac XL, especially since Apple discontinued the Lisa/Mac XL. The following articles cover products introduced by Sun and Dafax.

MacWeek

Dafax aims to teach new tricks to Lisas, XLs.

(upgrades for Apple products)

April 10, 1990

Malba, N.Y. -- Under the motto, "Who says you can't teach an old dog new tricks?" Dafax Processing Corp. will this week begin shipping an accelerator board that it says will triple the performance of the Apple Lisa and Macintosh XL machines in most operations.

Dubbed the Xlerator, the user-installable board plugs into the Lisa/XL's processor socket. It provides a 68000 processor running at 16 MHz and SIMM (single in-line memory module) slots that can hold up to 4 Mbytes of zero-wait-state memory. Software accompanying the board gives users a choice of several ways to use the faster memory in conjunction with, or in place of, the slower original memory.

A base-model Xlerator, including fan, is priced at \$695. With a SCSI interface, the board is \$795; with SCSI and a programmable- array logic (PAL) chip that provides support for a math coprocessor, the price is \$895.

Dafax Processing Corp. is at 14 North Drive, Malba, N.Y. 11357; (718) 746-8220; (800) 323-1751.

MacWeek

Lonesome Lisas get new help.

(Apple Computer's discontinued Lisa system)

By John Battelle

September 12, 1989

Lonesome Lisas get new help

Boston -- Sun Remarketing last month marked the first birthday of MacWorks Plus, the software that lets orphaned Apple Lisa computers run Macintosh software, by upgrading the program and placing it onto a ROM chip. The company also lowered the price of a 20-Mbyte Lisa system and announced two new Lisa enhancements.

Sun Remarketing specializes in selling discontinued Apple hardware. It is the only major provider of systems and support for the installed base of 77,000 Lisas.

MacWorks Plus, introduced at the Boston Macworld Expo in 1988, is a software operating system that gives the Lisa most of the functionality of a Mac Plus. The new Version 1.1 will be available either in ROM on a card, which increases the system's performance, or as software that resides on the hard disk. Version 1.1 contains several new error traps to prevent system crashes and is compatible with far more Macintosh software packages, according to Sun Remarketing.

The MacWorks Plus Version 1.1 ROM card, priced at \$295, is due this month. To spur sales, the company announced that through Sept. 30 a Lisa outfitted with a 20-Mbyte hard disk, the new MacWorks Plus software and an 800-Kbyte floppy drive will sell for \$1,095, \$400 less than the regular price and more than \$800 less than a comparably equipped Mac Plus.

Sun Remarketing also introduced a \$595 board with 1 Mbyte of additional RAM on SIMMs (single in-line memory modules), bringing total Lisa memory to 2 Mbytes, and a \$249 board that gives the Lisa a SCSI port. The SCSI board is available now; the memory board is due later this month.

Sun Remarketing can be reached at P.O. Box 4059, Logan, Utah 84321; (801) 752-7631.

MacWeek
MacWorks Plus: Is there life left for Lisa?
(computer software for Lisa microcomputers)
by Jon Swartz
Aug 2, 1988

SAN FRANCISCO--Apple's black sheep may yet have a golden fleece if a program scheduled to be released this week lives up to its developer's expectations.

The \$200 software program, MacWorks Plus, allows the Lisa computer and its Mac incarnation, the Mac XL, to function as Mac Plus computers. MacWorks Plus will make the Lisa a large-screen Mac Plus," said Bob Cook, president of Sun Remarketing Inc., the Logan, Utah, company that developed the package.

BEHIND THE NEWS Sun, the country's largest supplier and servicer of out-of-production Apple equipment, bought Apple's remaining 7,000 Lisas in late 1986, and Cook is hoping

that MacWorks Plus will help him sell off the remaining 4,300 Lisas in Sun's Logan warehouse. "MacWorks Plus," he said, "opens the Lisa to new compatibility: Mac Plus software, HyperCard, MultiFinder and a lot of new things." The Apple program MacWorks allowed Lisas to run Mac Software, but the last release of MacWorks, Version 3.0, was in 1985, making it difficult to run any Mac software released since then on the Lisa. MacWorks Plus was mailed to beta-test sites on July 20, and Cook said a final version was expected to be available Aug. 1. The program is free to all users who buy Lisa computers from Sun, while current Sun customers with Lisas can purchase the program for about \$100, he said.

The software program operates on all three versions of Lisa and Mac XL sold by Sun: one with a 5-Mbyte internal hard disk, priced at \$995; one with a 10-Mbyte internal drive for \$1,195; and one with a 20-Mbyte drive for \$1,595. Additionally, the program supports 30- and 40-Mbyte hard disk drives and allows expansion up to 134 Mbytes, though pricing has not been set for those options. Until now, Cook said, the Lisa has been nothing more than a Mac 512K machine with twice the available RAM (1 Mbyte) and hard disk support.

Lisa users said they are looking forward to improving what Raymond Palkovic, the director of information systems technologies for GTE Corp. of Stamford, Conn., called the machine's "compatibility problems on a network." Added Palkovic, who oversees the world's largest Lisa installation, with 700 machines, "Hopefully, this program should improve the flow of information. We've got about 10,000 Macs all told, and the more compatibility, the easier it is to manage a network."

Palkovic and other Lisa users like Bob Whelan, president of Whelan Biomedical Inc. of Cambridge, Mass., said that any upgrade to the Lisa is a welcome sign. "We'll use them until they're fully depreciated," Palkovic said.

This enthusiasm isn't shared by most industry observers, who see MacWorks Plus as just another wayward step in the computer's death march. "Any Lisa product is an answer in search of a question," said Brian Boyle, director of research at Novon Research Group of Berkeley, Calif. "I don't know if it's sound marketing."

"Nothing has been done for the Lisa in five years. Why start now?" asked Ron Johnston, A/UX engineering manager at Apple. "The Lisa was a novelty. The logic of reviving it escapes me."

Another company working on a Lisa project has also met with similar skepticism. Omnis Industries International of Oroville, Calif., has assigned 12 engineers to bring A/UX features to the Lisa. Despite bold predictions by the company's marketing president, Frank Bernhard, that the project will be finished by the end of the year, industry observers have either dismissed the project or questioned its marketability. "It sounds," said Boyle, "kind of like TWA adding a bunch of prop planes to its fleet."

"If their attitude was adopted by everyone," Bernhard retorted, "nothing would be accomplished in the computer industry. The Lisa isn't dead."

Ever since its introduction in 1983, the machine has been hailed and derided by computer industry observers as a trend-setting -- if not expensive and obsolete -- machine.

While it has an installed base of 40,000 and remains in use at several companies for low-end desktop publishing, word processing and database management, the Lisa has been out of production for several years and is generally regarded as Apple's least successful computer.

The Lisa was among the first microcomputers with a mouse, windows, multitasking, and cut-and-paste functions, but the original \$10,000 price tag made it something of a luxury for corporate users. The introduction of the Mac less than a year later, with its comparable power, features and \$2,500 price, further weakened the Lisa, whose price by then had been halved because of slumping sales.

Apple stopped producing the Lisa in 1985, shortly after it introduced the Mac Plus. Perhaps fittingly, the Lisa met its ignominious end renamed the Macintosh XL.

"There is no future for the Lisa. It's dead and buried. The latest version of MacWorks is a useless stopgap measure," said David Smith, editor of MacTutor, a magazine for programmers.

CHAPTER FOUR

MACINTOSH COMPATIBILITY

Unless you are only interested in running Lisa 7/7 software, Mac software compatibility is a major issue for Lisa/Mac XL users. There are currently three systems available for emulating the Macintosh. MacWorks, developed and released by Apple, provides emulation of the 64k ROM chips found in the original Apple Macintosh and the Fat Mac (512K ram Macintosh). The last version of MacWorks, released in early 1985, allowed users to share their hard drive with 7/7 software.

MacWorks Plus, developed by Sun Remarketing, gives the Lisa/Mac XL's 128K rom emulation. This software allows emulation of the Macintosh Plus, one of the most popular Macs ever made. Since so many Pluses were sold, most non-color software will run on the Mac Plus (with enough ram) and will conversely run on the Mac XL with MacWorks Plus. MacWorks Plus can reliably run Mac system software up to version 6.0.2.

MacWorks Plus II is the most advanced operating system available for the Lisa/Mac XL. There are two versions available, the basic version, which will allow support for Macintosh systems up to system 6.0.7. The Pro version, when coupled with enough ram, provides support for system 7.0.1., Apple's current system version. This version should provide maximum software compatibility.

The lists below should be used as a general guide. The MacWorks Plus list was supplied by Sun Remarketing. No compatability list exists for MacWorks Plus II yet, but it should be very comaptible with most Mac software.

Software that works on Lisa Under MacWorks 3.0

=====

PUBLIC DOMAIN & SHAREWARE

=====

1000 Miles
2PDI
Air Traffic Controller
Animals
Artisto 1.4 or later
Banzai!
Bash Big Blue
Big Ben Clock DA
Billiard Parlor
Binhex 5.0
Blackjack
Blob Mgr Demo
Brickles
Calculators
Calendar DA
Canfield

Cap'n Magneto
Charger
CryptoSolve!
Crystal Raider
Daleks
Describe
Destroyer
Dialog Creator
Disk Catalog
Disk Info
Duck Hunt
Dungeon of Doom
Elevator Espionage (Social Climber)
Extras
Fade to Black DA
File Tree
FKey/DA Sampler
Graphics Viewer
Hangman
Info+
J Clock
Keeper
Kill
Little Black Book
Lotto
MacBillboard
Mac ID
MacImagery
MacSeven
MacTerm
Maxwell
MDSEdit
Menu Editor
MockPackage (Chart, Print, Terminal, Write)
Monopoly
Office Attack
Opus Clock DA
Packit
Packit III
Phraze Craze Plus
Pinball Player & Games
Pinup Clock DA
Quick Reader
Radical Castle
Recursive Curves
Red Ryder 9.4
Red Ryder Host

REdit
ResEdit
RLE DA
RMaker
Rolodex
Rotate Paint
Scarab of RA
Screen Saver DA
Social Climber (Elevator Espionage)
SortInit (alphabetizes the menus)
Spill & Spell
Stuntcopter
Sun Dial
Super Ruler DA
Switcher
Trick-Track
Unpit
Videoworks Player & Videos
Waystation
Wheel
XLBack
Zero Gravity

=====
COMMERCIAL PROGRAMS
=====

Disk Express
Double Helix
Feathers 'n' Space
Fedit Plus
Find File (Apple)
Fontographer
Fontastic
Forbidden Quest
FullPaint
Ground Zero
InfoCom text adventures
Lightspeed C
Lode Runner
MacBillBoard
MacC
MacDraft
MacDraw
Macintosh Programmers' Workshop (MPW)
Macintosh Programmers' Workshop C (MPW C)
MacPaint
Mac*Spell*Right
MacWrite

Microsoft Basic
Multiplan
Pinball Construction Set
Scott Adams' Classic 12 Adventures
SuperPaint
The Quest
ThinkTank 512
TOPS
Transylvania
WindowWare's Phone Book and Calendar

Programs that do not Work on Lisa Under MacWorks 3.0

=====

PUBLIC DOMAIN & SHAREWARE

=====

Amazing
Artisto Versions before 1.4
AutoBlack (Application) - Puts up a nice alert saying it won't run on XLs.
Bouncy
Buick Demo
Clock (vintage 3/84)...hangs
Core War
Demo 3D (spinning Mac)...bombs or hangs
Disk Catalog
DiskTop (requires 128K ROMs)
Handy DA - Part of Handy shows the area around the cursor in magnified form. This shows the wrong area of memory on an XL.
Hendrix...hangs
Iago
Idle
Iggy Iggopolis
Life (version? vintage 2/84)...distorted screen
MacLanding
MacMissles
MazeWar - some of the graphics don't get drawn.
Megaroids...hangs
Screensaver
Servant
Skipfinder
Space War!
SystemBugs
Talk Demo...bombs
ThrowPaint
Trojan Menu
Wargle
Word Count

=====

COMMERCIAL PROGRAMS

=====

Airborne!

Cricket Draw

Dark Castle - Puts up a nice alert saying it won't run on XLs.

Ferrari Grand Prix - Bombs with ID=26.

Fokker Triplane

Gato

Speech Lab - doesn't bomb, it just doesn't make any noise

TMON - Puts up a nice alert saying it won't run on XLs.

Vampire Castle

Wizards Fire - (Reagan's starwars game) works fine until the end of a round when it makes some sounds as it tallys the score, then it BOMBS

Actually, there really aren't many things that I have tried LATELY that don't work. Programs that use sounds (GAMES) other than system beeps seem to be the major cause of trouble. That and programs that expect the screen to be where it isn't. Most of the things that I have listed as not working are OLD, as in early Mac history. There is a distinct possibility that there are versions of some of these programs that now work on the XLisa. Credit for the list goes to Gary Kato.

Compatibility Listing For MacWorks Plus Tested Compatible

Program Name	Program Type
A	
*Adobe Illustrator '88	Graphics Utility
Alice	Game
AntiToxin 1.0	Virus Checker
Artillery	Game
Applelink	Communications
Appleshare	Networking Program
Appletalk	Networking Program
B	
Backgammon	Game
Banzai!	Game
Billiards	Game
BlackJack	Game
Brickles	Game
Bricks	Game
C	
Calendar Maker 3.0	Creates Calendars
Canvas	Graphics Program
Capture 1.3	Utility

ChemDraw	Chemistry Drawing program
Connect Four	Game
CricketDraw	Drawing Program
CricketGraph	Graphing Program
Crystal Quest	Game

D

Desk Paint	Painting Program
Destroyer	Game
*Digital Darkroom 1.0	Video Enhancer
Dinner at Eight 1.03	Create meal menus
Disk Express	Utility
Disk First Aid	Utility
Disk Fit	Utility
Dollars & Sense	Financial Program
Double Helix II	Database

E

Electric Checkbook	Checking Account Program
Elevator Espionage	Game
EZLabels	Creates labels

F

File Maker 4.0	Database
Font/DA Mover	Utility
Formatter Deluxe	Disk Formatter
4th Dimension	Database
Fox D-Base	Database
Freehand 1.0	Drawing Program
*Full Impact 1.0	Spreadsheet
FullPaint 1.0	Painting Program
*FullWrite Professional	Word Processing

G

GrandPrix	Game
Great Plains Acctg.	Accounting
GroundZero	Game

H

Habadex	Database Management
Habaword	Word Processing
Hangman	Game
Hearts 1.6	Game
HD Backup	Utility
HFS Backup 3.0	Utility
Hypercard 1.2	Database
*Hyperworks	Organizer

I

Icon Collect	Manipulate Icons
Icon Exchanger	Manipulate Icons
Icon Hacker	Manipulate Icons
Icon Manager	Manipulate Icons
Illustrator 1.1	Drawing Program
Imagestudio	Image Scanner
InLarge	Enlarge Screen Utility
InBox	Local Network
Interferon 1.0	Utility

J

Jazz	Integrated SS, DB, & WP
------	-------------------------

K

Kermit	Communications
Klondike 2.1	Computer Solitaire

L

Loderunner	Game
MacConcentration	Game
MacDaisy Link	Daisy Wheel Printer Driver
MacDraft 1.2a	Drafting Program
MacDraw	Drawing Program
MacDraw	Drawing Program
MacFootball	Computer Football
MacnTax	Tax Preparer
MacMissile	Like Arcade Missile Command
MacNet	Communications
MacPaint 2.0	Drawing Program
MacProject	Project Planning Tool
MacProject II	Project Planning Tool
MacServe	Network Program
MacSpell Right	Spell Checker
MacTerminal	Terminal program
MacWrite 5.0	Word Processing
MacYahtzee	Game
MaxPage 1.2	Page Layout
MaxPrint 1.3	Utility
MazeWars+	Game for modem or network
Microphone	Communications
Microsoft Fortran 2.2	FORTTRAN Programming
Microsoft Excel 1.5	Spreadsheet
Microsoft File 2.0	Database Management
Microsoft Word 4.0	Word Processing
Microsoft Works 2.0	Integrated WP, SS, & DB

MindWrite 2.0	Make documents from notes
MiniCad + 1.0	Cad/Cam Program
Missile	Game
Money Matters	Sm. money mgm't program
More	Presentation program
Mortgage Analyzer	Financial Manager
Multifinder	Multi-Tasking System Software

N	
NFL Challenge 1.02	Game
Nisus 1.01	Word Processor

O	
Omnis 3+ 3.3.01	Database
On Cue 1.3	Program Launcher

E	
Pagemaker 3.0	Desktop Publishing
Panorama 1.1.1	
Perfect Word	Bible Study
Postermaker +	Creates posters
PrintShop 1.03	Creates banners, cards
Pyro! 2.0	Screen Saver (DA)

Q	
QuarkExpress	Desktop Publishing
Quicken 1.03	Financial Program
Quickletter 1.0	Word Processing (DA)
Quickffail	Local network comm.

R	
Rags to Riches	Money Manager
Ragtime 2.0.1	Desktop Publishing
Ready, Set, Go!	Page Design Program
RecordHolder	Database
Record Holder Plus	Database
Resedit	Editor
RedRider	Communications
Reflex	Databse
ResEdit	Utility
Reverse	Game
Risk	Game
RoadAtlas	Creates maps

S	
Sargon IV	Computer Chess

Sidekick	Desk accessories
Simply Acctg. 1.0.3c	Accounting Program
Stepping Out II	Screen Enhancement
Suitcase II 1.2	Utility
*SuperPaint 2	Drawing Program
Symantec Utilities	Utility

T

Tetris	Desk Accessory
Think n' Time	Desk Accessory
ThrowPaint	Painting Program
Tops 2.0	Network Program
Transylvania	Game
Trapeze 2.1	Presentation Work sheet
Twelve-C DA	Desk Accessory

V

Vaccine 1.0	Utility
VersaTerm Pro	Terminal Program
V.I.P. 2.51	Visual Programming
Virus Detective	Utility
Virus Rx 1.4a2	Utility

W

Wingz	Spreadsheet
Wizard's Fire	Game
Word Perfect 1.0.2	Word Processing
WriteNow 2.0	Word Processing

Most earlier versions of above versions also work.
 programs with an "*" require 2 megabytes of ram.

Tested Incompatible

A

Apache Strike	Game
---------------	------

B

Beyond Dark Castle	Game
--------------------	------

C

Continuum	Game
-----------	------

D

Dark Castle	Game
Dungeon of Doom	Game

F	
Flight Simulator	Game
Frogger	Game
L	
LAZlife	Game
Leisure Suit Larry	Game
M	
Megaroids	Game
Master Juggler	Utility (DA)
O	
One on One	Basketball Game
P	
Pagemaker 1.0 & 2.0	Desktop Publishing; Version 3.0 Works!
Phrase Craze	Game
S	
Shanghai	Game
Silicon Volleyball	Game
T	
Thunderscan	Scanner

These programs have been tested on the Lisa/Mac XL computer in conjunction with MacWorks Plus. While considerable effort has been made to verify the functional compatibility of the listed programs, some programs may exhibit operational or cosmetic differences when executing. Variations in hardware configurations, enhancements or modifications to hardware or software components may affect execution.

CHAPTER FIVE

ON-LINE THREADS

The following threads (user discussions) were found on CompuServe, America On-Line and Genie. The first discussion took place in late November 1984 and gives a strong feel for the support the Lisa/Mac XL had in those dark days. The America On-Line and Genie discussions were more recent, and reflect the sometimes desperate needs of a new Lisa/Mac XL users.

COMPUSERVE THREAD I

Sb: #Apple Drops Lisa?
05-Nov-84 16:00:38

USA Today said that Infoworld, in its "latest edition", reported that Apple will drop the Lisa in 1985. Does anyone have more information on this? Is it a rumor or has Apple announced this officially? I don't get my Infoworld in the mail until Tuesday or Wednesday usually and have no other info.

Sb: #121368-#Apple Drops Lisa?
05-Nov-84 18:21:55

I got my INFOWORLD last week and indeed there was a random rumor (not Dvorak) indicating that they heard from a reliable source inside Apple that Apple will drop the Lisa line in '85. Since I got my Lisa in August this year I've been very happy, but now I'm worried. I bought an IMSAI a few months before they dropped their S-100 machine, and she's still working. But it is annoying! Any info would be greatly appreciated.

Sb: #121385-Apple Drops Lisa?
05-Nov-84 19:00:41

I doubt that Apple will truly drop the Lisa - instead, the Lisa & Macintosh lines will most likely be merged in the form of the rumored "super mac" (big mac?), which will have a larger screen, 512K standard, MAC Roms (so it will run Mac software without a pre-boot), and the Lisa's multi-tasking ability with an optional hard disk and UNIX OS.

Sb: #121385-Apple Drops Lisa?
05-Nov-84 21:00:37

Now, now. Let's not stretch the rumor. They DID NOT say inside Apple, all they said was a "usually reliable" source (FAT THROAT?). Personally, I think that kind of rumor mongering stinks and infoworld (note lower case) should be castigated for such a broad statement with no solid basis. I don't think anyone in Apple beyond Jobs and the top mgmt would be privy to such a plan anyway.

Sb: #Death of Lisa..

06-Nov-84 00:08:22

HOT TIP OF THE WEEK (InfoWorld Magazine, Nov. 19 issue) QUOTE "Apple will discontinue the entire Lisa line of computers sometime in 1985. We learned this interesting bit of news just before going to press, courtesy of a source who has always been reliable in the past. Apparently, Apple has finally decided to let the Mac absorb the business market originally intended for Lisa because the Mac is growing so powerful it's running into Lisa territory."

The Apple /// graveyard is certainly becoming a popular place these days. Wonder who'll be next ???

Sb: #121565-Death of Lisa..

06-Nov-84 01:11:42

Not the Apple // apparently. InfoWorld also had a big article ("exclusive" interview) with Woz on the //x coming out next year.

Sb: #121385-Apple Drops Lisa?

06-Nov-84 00:16:24

I agree with you that it is annoying to have a machine that has been dropped by the manufacturer. I have an Atari 800 (not an XL) and can't even get a 1/4 of what I paid for it in sale. We were discussing at work what this might mean to Fortune 500 and some vendors if this rumor is true. First it leaves several parties kind of out in the cold (as far as I know) i.e. Compugraphics and some of the software vendors which supply software to the Lisa office system environment. Second this might be seen as a weak move to remove the only machine in the family which can support a high speed hard disk, no the Mac Tecmar, Davong, and Corvus drives don't count. If the Lisa is replaced by Apple it should be done only at the same time a BETTER replacement is available. - I also agree that the rumor mill has been working overtime in the computer industry in the last year or so. Although I generally condemn the "Rumor Mill" this too is a double edged sword. Though the rumors are destructive they can also be helpful, especially to corporations who can get caught holding the bag with millions of dollars worth of outdated equipment. I guess no one ever said life would be easy ... <sigh>

Sb: #121565-Death of Lisa..

06-Nov-84 17:08:53

I have to say that this might very easily be a case of poor reporting. Just from looking at the market, and with no inside info of my own, I would say that Apple will be canceling the Lisa -- but only to bring out something better and compatible with existing Lisa products. I suspect that Apple may be interested in bringing the top end of the Mac line into Lisa territory and so might be developing new machines. I have a feeling that quote is similar to saying the //+ was discontinued when Apple brought out the //e.

Sb: #121451-Apple Drops Lisa?

06-Nov-84 18:05:19

On the other hand, when Doug Clapp appeared here for a CO last May, he said Apple would kill the Lisa in two or three years, because by that time, Mac would be everything Lisa was, and more.

Sb: #121643-Demise of the Lisa
07-Nov-84 02:23:40

Strong smell of fish about that rumor. 1) Even the /// wasn't de-supported within 12 months of its last revision. 2) Apple just went into the roll-its-own hard disk business for the 2/10 (admittedly a useful resource for a Mac HD, but...); it's gone to all that expense just to drop the product? 3) Apple is only just making real money on the Lisa; "power" and "credibility as a business machine" for the Mac is no reason to stop accepting the money people are eagerly thrusting upon you. 4) Not even the most delirious rumors I've heard indicate true multitasking in the near future for the Mac -- the MACTEAM seems to deny it; why would Apple withdraw a capability that sells machines from the market entirely? I don't believe it.

Sb: NO! Lisa Lives!
07-Nov-84 19:54:26

Well, upon reading the Nov 5th issue of Computer Retailing News, it appears that Apple isn't killing off the Lisa, they are just officially moving it under the wing of the Macintosh. Effectively, they have resigned themselves to selling the Lisa systems as BIG-BIG Macs. All future products will have the Macintosh name. No big rush to rename the Lisa products to Macintosh names (MacLisa?). But the Lisa will still be the primary development system for some time to come (at least in Apple's opinion...)

Sb: #121896-#Demise of the Lisa
07-Nov-84 21:38:40

You may be right. Our (Wall Street Journal's) reporters tried to follow up InfoWorld item on Lisa cancellation, and hit denials from Apple. But SOMETHING is going on, some change in marketing or bundling or something involving Lisa.

Sb: #122060-Demise of the Lisa
07-Nov-84 22:56:20

I prepared this message (with the WSJ in front of me) and then decided to look for an entry into the thread. You're it!!!! Perhaps the following paraphrase from Steve Jobs might help clear the air re the future of Lisa. Apple will "phase out" certain software products for its pricey Lisa computer and attempt "to reposition the Lisa" as a more powerful machine within the family of MacIntosh computers. (WSJ 11/7/84) Sculley was the main talker, so far as quotes were concerned. He identified the goals of Apple for 1985: to establish Apple as a serious contender in the office market with its networking system, which will permit many micros - including those made by IBM - to communicate; to penetrate deeper into

international markets; to build and protect the company's strong position in the education market.

Sb: #122026-NO! Lisa Lives!
07-Nov-84 22:26:12

Yes, yes, Lisa lives. I see the Lisa 2 (which, by the way never said LISA on the front like the Lisa 1 did) as assuming the matriarchal position in the 'intosh family. It has all the hardware it needs by itself. It has three slots to interface to name-that-bus. And the story goes that all it needs to directly talk to the Mac stuff on its hard disk is an icon called "scrapbook".

Sb: #121896-#Demise of the Lisa
07-Nov-84 23:18:30

No offense intended, but I think you're whistling in the dark. I think it's true that Apple is finally beginning to show a profit on the Lisa, but only at the cost of misleading a lot of people who bought them last Spring. How many Lisa 2/10's would have sold earlier in the year if it were known then that Apple was about to stop its own Lisa development, and was even then discouraging third-party software development? Those profits simply won't last as these facts become widely known. Since the Mac finished its successful first 100 days, Apple has shown every sign of working for the Lisa's quiet demise through neglect and negative rumor. When the 512k Mac was announced, Cary Lu flatly stated in InfoWorld that the Lisa was dead. Apple remained silent. When Apple talks about Applebus, Lisa is not mentioned. Not a single review of Lisa 7/7 has appeared, and none will. Apple has not spent a single penny marketing the Lisa since the Mac took off. Does this sound like a company actually trying to market a computer? Or perhaps like a company looking to blame market forces for a decision it made sometime ago, but couldn't justify in view of its own conduct at that time?

This is what's left of the Lisa to market: A beautiful, but expensive, machine that runs one integrated, multitasking package called 7/7. Beyond 7/7, the Lisa can be used as a powerful (but non-multitasking) Mac, but why spend more for a Lisa when the 512k Mac is now available? Aside from that, all that's left is UNIX, and you'd be better off with other machines (or so I'm told) for UNIX.

I think it's obvious that Apple has decided that it won't continue to support both Lisa and Mac. Implicit in the decision to go with the Mac and drop Lisa, I think, was the judgment that Apple can get by without a multitasking system until it can be done on the Mac. Apple has made some mistakes here - bad ones, in my opinion - and they're simply trying to cut their losses. I think that many people on this SIG tend not to see the hubris exhibited by Jobs and some others at Apple, for the simple human reason that they need you folks right now more than you need them: You are the center of Apple's attention for now; it's corporate policy to make you happy. It's hard to be on the receiving end of all this neat stuff and still take a deeply critical look at them. At the same time, the people from Apple with whom you deal directly are the ones directly responsible for the Mac itself, and they all seem to be good, caring, professionals eager to share their technical expertise. To many of

you, these people are Apple, and they have become your friends and colleagues in an exciting venture. But these guys don't make corporate policy. Even Woz seems to have little influence when it comes to corporate policy: That's Jobs' and Sculley's ballgame. And that's all you're talking about here. I respect and admire the people on this SIG for the high level of technical dialogue, the friendship and sharing you show each other, and the excitement you bring to this technology. But when it comes to Apple's motives and tactics, I think many of you should take a closer look. Apple's still in a battle for survival, and they've shown that they're not above shooting a few rounds of friendly fire if that's what it takes to win.

Sb: Lisa alive

08-Nov-84 04:19:24

At tonight's Show Page (San Francisco Mac user group) meeting an Apple person (Larry Shykin?) said that Lisa won't die "for at least two years". He demoed MacWrite 3.2, Project and Draw. Also he said that there will be something flashy at the Jan. stockholders meeting but if any one is waiting to buy a Mac until then they might as well buy it now.

Sb: Demise of the Lisa

09-Nov-84 11:54:55

The Lisa is being dropped, though only in name. To be replaced with the Macintosh line (with multi-tasking!) The multi-tasking will not be available at once, but soon. Also 7/7 software will be available for the "new" Mac! Apple seems to have decided along with most everyone else that the Macintosh is just simply a better machine. PS: This comes from a very reliable Apple Source!

Sb: #122266-#Death of Lisa..

10-Nov-84 02:20:39

Friend of mine who owns a Lisa and hadn't been able to decide on an upgrade called Apple. He claims some guy told him they're already lining up a Mac board swap for the Lisa which should be available very soon. Price seemed a bit steep (can't remember what it was, but he was given a specific price for it). Board is supposed to be fully compatible with Mac. He also had a price for Lisa software "upgrade" for this machine. Is this friend pulling my leg? Heard anything else about it? Think I'll try to find out who he talked to with Apple.

Sb: #122770-Death of Lisa..

10-Nov-84 05:13:57

The Wall St. Journal had a short item (Tuesday, I think) about Apple's profits...at the end, Jobs made some very ambiguous remarks about "realigning the Lisa to better integrate it with the Macintosh line" or some such...I speculate that they may be serious about chopping it down to be more Mac-like.

Sb: Apple & Lisa...

14-Nov-84 00:02:05

In this month's issue of Signal (207 Granada Drive, Aptos, CA, 95003) they had a response from Apple concerning the future of the Lisa. It was written by Timothy J. McNally, the Lisa Product Manager:

*** WE HAVE JUST MADE A SUBSTANTIAL INVESTMENT IN A BUILDING IN DALLAS DEVOTED ENTIRELY TO LISA PRODUCTION**

The production line boasts increased efficiency, yields, and reliability, and is helping us meet the backlog on Lisa 2/10 systems and upgrades. In fact, all 2/10 upgrades should be complete by the middle of November. The reason for the upgrade delays has been the overwhelming demand for them, and our limited capacity in the previous months. As of October 2th, we have built a 2/5 upgrade for every Lisa 1 ever built! 2/5 upgrades should all be delivered by the end of October.

*** LISA SHIPMENTS CONTINUE TO BE STRONG**

Last month we shipped more 2/10's than ever, produced by our new 2/10 production line. We are still seeing demand for Lisa 2 and 2/5, but that demand has been reduced by the introduction of the Macintosh 512K. We will continue to meet the demand for Lisa 2 and 2/5, but we will focus our capacity on the Lisa 2/10.

*** LISA IS AN INTEGRAL PART OF OUR OFFICE STRATEGY**

We absolutely cannot afford not to have a hard-disk based workstation in the office. The demand for hard-disk based systems remains strong, and Lisa is there to fill that demand, with its unparalleled user interface. We will continue to refine Lisa 7/7, in light of customer inputs regarding bugs in the software, and we will continue to work on ways of linking Lisa and Macintosh software.

I hope these conditions and actions show to you our commitment to Lisa. We will in the coming months reinforce that commitment to our sales force and our dealers.

Sb: #124056-Apple & Lisa...
14-Nov-84 23:36:01

Thanks for that release from Apple. I think the Macintosh is an amazing machine, but the Lisa is also a fascinating machine that addresses another level of PC needs. Its only real problem is lack of marketing attention from Apple. That lack of attention translates to the lack of the "insanely great" (TM) Toolkit for fully Office System integration of third party software. (Actually the finished Toolkit has just been released but it is not supported by Apple). That leaves a lack of third party software which for a while led to a lack of enthusiasm from potential buyers. Now the Lisa 7/7 software and the machines excellent design has "vetoed" Apple's lackluster marketing for the Lisa and customers are beginning to really buy it. In light of all this, that announcement from Apple is good news.

Compuserve Thread II

#: 9260 S9/The Lisa Lives!

10-Jan-86 22:37:01 Sb: #8632-XLBack

Ah, excuse the interruption, but it sounds like you're skirting a problem I've been wrestling the last 3 weeks. Briefly: if system files on XL hard disk (rom 3A/88) get scrambled, and rebooting from floppy does not bring up HD icon, is there any way at all to get into files on HD without re-initializing??? (Important data in there, & "File error" message on only backup floppy, you see: no luck getting answers from Apple.) Thanks for any suggestions!

12-Jan-86 16:25:46 Sb: #9671-SCRAMBLED HARD DISK

This happened to myself, I just reinstalled the shared hard disk with the hard disk install application, to my surprise all original files showed back on the hard disk. The symptoms that caused this were all my system and finder files were wiped out in a bomb error. When I would try to start up the Mac XL it would just blink on and off very quickly. I hope this info helps you out.

14-Jan-86 06:13:19 Sb: MAC XL

Here is a quote from the LisaTalk Report that may help - "The XL can be forced to ask for a start-up diskette instead of always defaulting to the hard disk after you turn it on. If the XL is off, turn it on and as soon as it gets finished checking the last board in the start up sequence (the fourth "click") -- Push the "Option" key and hold it down. Timing is important here. If you push the "Option" key too soon, you will get the Lisa start-up choices dialogue box, not the little diskette icon. If you are a little slow, it will default to the MacWorks hard disk. If you do it right you'll soon see a diskette icon with a flashing question mark in it. Put in your diskette and away you go." The Diskette will be your startup disk and the hard disk icon should appear below it. You should then be able to replace your damaged system file.

14-Jan-86 11:10:29 Sb: MAC XL

If the previous procedure does not work try this - 1. Startup the Lisa. 2. Insert Macworks XL disk. 3. During the memory check press Command-2. 4. Then immediately press and hold the Option key until the Macworks XL disk is ejected and a disk icon appears on the screen with a blinking question mark in it. 5. Insert a diskette with a system folder on it. 6. This diskette will be your startup and the hard disk icon should appear below it. 7. You should then be able to replace your damaged system file. 8. If your hard disk icon does not appear try holding down the Command and Option keys immediately after the diskette is booted so that the hard disk desktop file is rebuilt.

14-Jan-86 17:41:05 Sb: MAC XL

I have the same problem. You play around and you're stuck with it. The best way, I have found is to re-initialize the hard disk using a Lisa System disk (it seems to do a better job) then power out and restart form the Internal Drive (hold Opt/Apple key down after diagnostic of main system until '?' comes up and re-install the system. Two trick I found

Thanks guys, I will call them in the AM. However, if anyone has the original software used that can be purchased, I would rather do that.

Subj: Lisa Software 91-05-08 00:32:02 EDT

WOW!!! Sun wants \$200 for the MacPlus software. That cost more than the Lisa computer itself! Ok ex-Lisa owners, who has an old ORDINAL copy of MacPlus I can Have/buy/steal from you? Someone out there must have it. \$200 is more than I can put into this dinosaur.

Subj: MacWorks 3.0 vs Macworks+ 1.0.18 91-05-13 23:37:57 EDT

I think if you plan to get much use out of your LISA you need to spring for MACWORKS + v 1.0.18 from SUN. It make both of mine run well. The one still running the Widget drive is a little cantankerous from time to time but the one with the SUN 20M internal HD always just goes. You said that you were having trouble getting the HD to mount. There is some software out to help with that. If you stay with it, drop a note back in here an I'll try to copy it. It is a Lisa format disc that I have used in the MACWORKS + version from .8-1.0.16. .18 seems real dependable. Good luck with the mother of the MAC. If mine breaks again its an LC monochrome in its place.

Subj: Lisa software 91-05-14 00:03:32 EDT

I found someone with system software, but he said it was serial numberized with the ordinal CPU or something like that. I talked with a dealer and he said MAC II software 3.05 should work just fine.

Is there a Lisa users group out there?

Subj: Sigh... 91-06-22 12:38:46 EDT

I kind of liked the Lisa 7/7 software suite -- there wasn't anything on any other computer that approached it until fairly recently. I'd enjoy seeing the Lisa OS implemented on hardware fast enough to support it decently (like a IICI). Of course, Apple would be insane to actually do it, but it'd be fun...

Subj: LISA WOES! 91-07-02 21:14:48 EDT

I too have an unusable Lisa that has been handed down through the ages! My machine boots to a sad MAC message which (near as anyone has been able to tell) informs me that the 20 MB disk drive is shot. Since I don't have a good copy of software on floppy, I can't boot the machine at all. I don't really want to spend the dollars for a new drive (unless I know the machine will work). Any suggestions? Anyone have a system disk I can borrow?

Subj: Lisa 91-07-05 21:31:17 EDT

What kind of Lisa is it? Sounds to me like it is a Lisa 2/10 with a 10 mb HD. Are you getting sad Mac code, or a Lisa error message? If it really is a sad mac, then the hard drive

can't be bad, as MacWorks (software that makes the Lisa emulate a Mac) is being loaded in. Does it have a 20mb SCSI drive in one of the three expansion slots?

Subj: 20 M HD 91-07-06 02:44:14 EDT

As an operator of a series of X/Lisas, if you have a 20mb HD it is a Sun Unit. In my experience it will take their software to make it go. If it is a 10mb Widget some experienced XL user will have a special disc to recover from a crash like you have. I have one but I am unable to copy it as it is part Lisa, part MAC and takes ?? Copy II MAC?? to sector copy it?? I don't own this software to copy it. If it has a 20mb Sun it is fairly new and someone who owned it should have the software to pass along to you. My 20mb Sun doesn't have a LCD that flashes on the front of the case like the 10mb Widget does. The 20mb takes only a fraction of the space in the HD carrier that the 10mb Widget did. I have retired 2 of my 3, the 5mb external version and the 10mb Widget version. I hope the 20mb upgraded one will last me until I can payoff my portable and see my way clear to an LC w/single page display. Cheers from the land of the midnight sun.

Subj: Lisa Sad Mac Message 91-07-06 19:20:22 EDT

I'll take the machine apart (again!) and determine the exact drive type and capacity. I know it's the original drive that came with the machine years ago. I'll also post the sad Mac message. Get back to you soon. Thanks.

Subj: Lisa Config 91-07-14 12:12:31 EDT

The Lisa in question is 10MB HD and 400K floppy. I believe it's all original Mac equipment (since it has their logos all over it!) Any ideas?

Subj: Lisa Sad Mac on startup 91-07-27 02:43:03 EDT

Can someone help me help this user by walking me through a way to copy the disc that salvages hard drives that can't be found?? I believe it was a special disc sent to dealers to solve the problem of being unable to recognize the hard drive system. My disc says MAC System Hard drive repair NOT MAC FORMAT. Probably Sun or DaFax on the East coast should have it. I'll try to find someone with Copy II MAC.

Subj: Lisa Sad MAC face 91-07-27 02:45:21 EDT

More information that came with the "Hard Disc Mount (version 2)" a utility for Macworks startup Error 0F0064.

Subj: Mac error message 91-08-10 13:40:03 EDT

The error message you describe is the same one I have experienced. Only now, it's worse. I can't even get an image to the screen when I try to boot! I'm not sure any one can help at his point but thanks for your efforts.

Subj: Lisa Software

91-08-29 20:54:45 EDT

I would imagine that the sad Mac errors you are encountering are due to the corruption of MacWorks on your Widget drive. I would suspect bad boot blocks, or a corruption in MacWorks that hits fairly early in the boot process. Having used a Lisa with both MacWorks from Apple and MacWorks Plus from Sun, I would say get MacWorks Plus--no question. MacWorks Plus has 128K ROM emulation, not 64K ROM emulation like MacWorks. I have been running my XL for over a year on System 6.0.3 and it's been solid as a rock. Word 4.0, Excel 2.2, Fourth Dimension. . . all have worked fine.

Call Sun- The latest catalog I got now has MacWorks Plus selling for \$99.00. Much better than the \$200.00 they were asking, and a cheap way to get a Mac Plus compatibility out of the Lisa.

I will admit, I don't run MacWorks Plus anymore, though. I got a copy of XENIX, and now it's UNIX time on my Lisa. . .

GENIE THREAD

Message 1 Fri Oct 18, 1991

Does anyone have some info about the Lisa I just acquired? I understand that it can use Plus software, can anyone confirm this? I also understand that there is a source for both info and hard/software, can anybody help there? Thanks in advance for any help given.....L.

Message 2 Fri Oct 18, 1991

I have relatively little hard info, but I believe Sun Remarketing sells system and application software. It basically allows the Lisa to run System 3.2 and behave like a Mac Plus. You should contact them if you haven't already done so.

Message 3 Sat Oct 19, 1991

Sun Remarketing does sell a software package called MacWorks Plus, which essentially makes your Lisa emulate a Plus. It does so pretty seamlessly, by the way. You're not constrained to out-of-date system versions, though - MacWorks Plus runs on 6.0.2 at least, and more recent versions of the program may support more recent system versions. From my limited experience with the program, it really seems to work well. My most recent Sun catalog has the price at \$200 plus \$4 shipping. Their # is 800/821-3221, 24 hrs a day. They also have 800K floppy kits, RAM upgrades and SCSI cards as well as accelerators for Lisas. They've done me very well in the past, so I can recommend them highly.

Message 4 Mon Oct 21, 1991

That's good news. Your comments are very helpful as well, since you have direct experience that few of the rest of us do. Glad you saw this one go by.

Message 5 Mon Oct 21, 1991

I really appreciate all of your help. I think that this will give me a good leg up, thanks.

Message 6 Sat Oct 26, 1991

Glad to help, I've gotten enough of it here myself. If you have any other questions or problems Conan (where'd you get that nickname? :)) please feel free to post a message or drop me Email.

Message 7 Tue Dec 24, 1991

Hi all, Yes I too just got a Lisa. It's the Lisa/2 renamed Mac XL with a sticker on the manual. Any information on this? Unfortunately I threw out a Mac mag with UG (users group) info. But I thought I remembered that if you put in 128K ROMS and enough memory you were there. except for appletalk of course-just use the Asych, it's almost great!. Can anyone give me real specs on my unit. No idea on the ram, etc.

Message 9 Wed Dec 25, 1991

A Lisa is nothing like a Plus or 512KE. It emulates a Mac through the use of the MacWorks software that makes it a Mac XL. The only upgrades I am aware of are from Sun Remarketing that re-sells Lisa/Mac XL as a primary business. Also note that the Lisa runs at 5mhz if I recall, so its slower than either a 512k or Plus.

Message 10 Wed Dec 25, 1991

Also, I feel sure that if an "upgrade" could be obtained, it would cost more than a good, used Mac Plus would cost.

Message 11 Sat Dec 28, 1991

Lisa 2s came with a 3.5" 400k "flexible disk" drive, 1MB Ram and a 10 MB Apple built hard drive. I have also had good experiences with Sun Remarketing when I added 20MB Miniscribe drive several years ago. Your query brings back fond memories. The Lisa OS had true multi-tasking, virtual memory and fully integrated software back in 1984! Unfortunately, it only had a 4.7 Mhz 68000, a max of 2MB RAM and a 10 MB hard drive to support this refinement. Patience was a required virtue for a Lisa aficionado. Sad to say, our Lisa/Mac XL is now languishing in the closet. Santa brought my wife a Quadra yesterday. One peek under the hood of a Quadra will shock anyone whose looked inside a Lisa. The Quadra is flimsy with snap together parts and so few chips you wonder if you got all the pieces. The Lisa looks like a baby mainframe with a sturdy aluminum chassis, knurled thumb screws and 512k memory cards the size of the whole Quadra motherboard. The Quadra is HOT; the Lisa is elegant.

Message 12 Thu Jan 02, 1992

Thanks for the response. Yes, a look inside the Lisa had me drooling. It looks like what a

computer, especially a multi thousand \$\$\$ one. To let one go to waste is a shame. Are there (m)any techies on this (weird stuff on line tonight!) topic? Could the slow 68000 just be replaced with a faster one? Also, are there any specs on the monitor, could it be salvaged to be used with another Mac? Might look cool in a clear plexi case. My problem is the power supply seems shot. And \$200 to replace the whole module is not cost effective. Could just the power the power transformer be replaced, any specs out there?

Message 14 Thu Jan 02, 1992

No, the slow 68K cannot be replaced, it would require a re-design of probably most of the computer. Acceleration is more than adding a faster chip and clock. Many of the computer's timing is based on the clock speed for which it was designed, therefore you just cannot change to a faster processor and up the clock speed without breaking something else. I've seen one person place the insides of a Mac Plus attached to a Lisa screen and chassis... basically a slightly larger screen Plus. As for the power supply...hard to say where you could find a cheaper one if any at all outside of Sun Remarketing.

Message 15 Thu Jan 02, 1992

I actually have a Lisa tech manual around somewhere in a box. It was quite ahead of its time, but well behind today's technology. You could probably gut it and put a IICI logic board into it, though :).

Message 16 Sat Jan 04, 1992

You folks are always one step ahead of me... I've been running Spectre Mactaris for a while (mac emulators) and they run at almost Mac II speed (almost). And they have exactly the same size screen. Any info on gutting and replacing, thoughts? If the speed is that slow, replacing the power doesn't pay. Also, if I have to use the screen from my sys, can the Lisa screen be salvaged for use on another mac (II)? Could help squeeze the current budget to get that cx I want. Thanks.

Message 17 Fri Jun 12, 1992

I have heard that another company besides Sun is going to sell a Mac Plus emulator for Lisa. Has anyone else heard this? Also, I would like to purchase an original MacWorks Plus with docs from someone. Anybody got one lying around??? Leave e mail

Message 18 Fri Jun 19, 1992

DAFAX 800 323 1751 is what I was looking for...coming out with lots of Lisa stuff!

CHAPTER SIX

TRUE BLUE LISA STUFF

Lisa to Mac Transfer Documentation (This software is available on Compuserve)

“Lisa to Mac” and “Mac to Lisa” are a pair of complimentary programs which permit the exchange of Lisa Office System programs to be exchanged by telecommunications. Lisa to Mac converts a Lisa 7/7 diskette into a MacIntosh file while Mac to Lisa converts the MacIntosh file back into a Lisa Diskette. Both programs are written in MSBASIC 2.0. These programs are not meant to be a finished product or to establish any standard. They are to demonstrate feasibility and to stimulate further experimentation.

To use “Lisa to Mac” and “Mac to Lisa” it is necessary to have MSBASIC 2.0 and either a Macintosh computer or MacWorks on the Lisa. The programming is run entirely in the Macintosh environment.

To prepare a program on the Lisa for uploading; format a fresh diskette in the Lisa Office System environment. Transfer the program you wish to upload to the diskette by duplicating it and dragging the duplicate copy onto the diskette just formatted. Bring up the Macintosh operating system and run “Lisa to Mac” supplying the requested information. If you run the program from the Hard Disk in the Lisa you need only supply the Macintosh file name when requested. If you are using a Macintosh it must be two drive Macintosh with a Macintosh volume in the external drive. (The Lisa diskette is always in the internal drive). On the MacIntosh you must supply the fully qualified file name, that is it must be in the form Volume:filename.

Once you have converted the Lisa diskette into a MacIntosh file you can then upload the file with any program that supports Mac Binary transfers (such as Red Ryder or FreeTerm). You must download the files with a program that supports Mac Binary transfers.

To convert the downloaded file you must run the “Mac to Lisa” program again, supplying the necessary information when requested. You will be asked to insert the “destination disk”; this must be a freshly formatted disk but it may be formatted in either the Mac or the Lisa environment. Again the file name must be fully qualified if you are using a MacIntosh and the Lisa diskette will be in the internal drive.

Deserialize Lisa 7/7 Office System software:

Since 7/7 software was shipped with each Lisa, it was serialized to that specific machine as a sort of copy protection. Therefore, if you acquire the software and hardware separately the 7/7 software will not run out of the box. This can be corrected by utilizing the following procedure.

To de-serialize 7/7 Applications: Clear byte 42 (hex) in each Tool directory entry. (Tools are named {T1}obj, {T2}obj, etc.) I use FEdit. These directory entries follow a condensed directory which just lists file names. These are one sector per tool, with the desk-top name

later in the bottom half of the sector. As you can see, LisaWrite should be on sector 45 (2D hex). Need I say, make XLCopy copies of these guys BEFORE doing anything, and de-serialize the COPY ONLY.

I have tried to include some other fields that I can ID.

CHAPTER SEVEN

Lisa/Mac XL Software

There are a few shareware and public domain programs available specifically for the Lisa/Mac XL. This list contains those programs found on Compuserve, a large commercial system available around the world.

TN098.WRT/Bin Bytes: 2560, Count: 9, 21-Jul-90

Title : TN098 - Short-Circuit Booleans in Lisa Pascal obs

Keywords: TN098 SHORT-CIRCUIT BOOLEANS LISA PASCAL OBSOLETE

This file is part of Apple Computer's Macintosh Tech Notes series. See TNDES.WRT for information on the Tech Note files.

This is TN098 - Short-Circuit Booleans in Lisa Pascal obsolete

SLASM.WKS/Bin Bytes: 7296, Count: 46, 29-Sep-85

Title : Lisa Pascal: SaneLibAsm.obj (OBSOLETE)

Keywords: SUPPLEMENT LIBRARY SANE SANELIBASM LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. This is a Lisa Workshop file (in MacBinary format), and must be moved into the Workshop with MacCom.

This is file "New:obj/SaneLibAsm.o"

OSTRPS.WKS/Bin Bytes: 16000, Count: 55, 29-Sep-85

Title : Lisa Pascal:obj/OSTraps.obj

Keywords: SUPPLEMENT LIBRARY OSTRAPS LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on

the Software Supplement files. This is a Lisa Workshop file (in MacBinary format), and must be moved into the Workshop with MacCom.

This is file "New:obj/OSTraps.obj"

LSLASM.WKS/Bin Bytes: 17024, Count: 39, 29-Sep-85

Title : Supplement file 'New:Lisa/SaneLibAsm.obj'

Keywords: SUPPLEMENT LIBRARY SANE SANELIB LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. This is a Lisa Workshop file (in MacBinary format), and must be moved into the Workshop with MacCom. This is file 'New:Lisa/SaneLibAsm.obj'.

AZSPCH.ACL/Bin Bytes: 1920, Count: 377, 18-Sep-85

Title : Supplement file "New:lib/speech.lib"

Keywords: SUPPLEMENT LIBRARY MACINTALK SPEECH LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. This is file "New:lib/speech.lib".

P30LPC.WRT/Bin Bytes: 35584, Count: 26, 18-Jul-85

Title : Post 3.0 Lisa Pascal Compiler memo

Keywords: SUPPLEMENT DOCUMENTATION MANUAL MACWRITE LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. See MACBIN.HLP (in DLO) for downloading information. This is file "SS Docs:'Post-3.0' Lisa Pascal Compiler Memo".

MWKBUG.WRT/Bin Bytes: 7936, Count: 72, 05-Jul-85

Title : Mac Software Supp.: Macworks driver bug (OBSOLETE)

Keywords: SUPPLEMENT DOCUMENTATION MACWRITE BUG MACWORKS LISA

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. See MACBIN.HLP (in DLO) for downloading information. This is file "SS Docs:MacWorks Driver Bug".

TOOL1.TXT/Asc Bytes: 40050, Count: 30, 28-Jun-85

Title : Software Supplement - INTRFC/TOOLINTF.TEXT

Keywords: SUPPLEMENT TEXT INTERFACES TOOL TOOLBOX TOLLINTF LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information

on the Software Supplement files. This is a TEXT file, for MDS Edit.

This is file "Lisa Pascal:INTRFC/TOOLINTF.TEXT".

SPCHI.TXT/Asc Bytes: 2545, Count: 202, 28-Jun-85

Title : Lisa Pascal: SPEECHINTF.TEXT (OBSOLETE)

Keywords: SUPPLEMENT TEXT INTERFACES SPEECH MACINTALK SPEECHINTF
LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on

the Software Supplement files. This is a TEXT file, for MDS Edit. This is file "Lisa Pascal:INTRFC/SPEECHINTF.TEXT".

SANLIB.TXT/Asc Bytes: 15945, Count: 21, 28-Jun-85

Title : Lisa Pascal: SANELIB.TXT (OBSOLETE)

Keywords: SUPPLEMENT TEXT INTERFACES LISA PASCAL SANE SANELIB

This file is part of AppleComputer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. This is a TEXT file, for MDS Edit. This is file "Lisa Pascal:3.9 ONLY/INTRFC/SANELIB.TEXT".

QD2.TXT/Asc Bytes: 2330, Count: 30, 28-Jun-85

Title : Mac Software Supp.:QuickDraw2.Text

Keywords: SUPPLEMENT TEXT INTERFACES QUICKDRAW LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. This is a TEXT file, for MDS Edit. This is file "Lisa Pascal:INTRFC/QUICKDRAW2.TEXT".

QD.TXT/Asc Bytes: 18195, Count: 35, 28-Jun-85

Title : Mac Software Supp.:QuickDraw.Text (OBSOLETE)

Keywords: SUPPLEMENT TEXT INTERFACES QUICKDRAW LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be redistributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. This is a TEXT file, for MDS Edit. This is file "Lisa Pascal:INTRFC/QUICKDRAW.TEXT".

PASLBI.TXT/Asc Bytes: 1670, Count: 14, 28-Jun-85

Title : Lisa Pascal:INTRFC/PASLIBINTF.TEXT
Keywords: SUPPLEMENT TEXT INTERFACES PASLIB LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be redistributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. This is a TEXT file, for MDS Edit. This is file "Lisa Pascal:INTRFC/PASLIBINTF.TEXT".

PACKI.TXT/Asc Bytes: 10175, Count: 20, 28-Jun-85

Title : Lisa Pascal:INTRFC/PACKINTF.TEXT
Keywords: SUPPLEMENT TEXT INTERFACES PACK PACKAGES PACKINTF LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be redistributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. This is a TEXT file, for MDS Edit. This is file "Lisa Pascal:INTRFC/PACKINTF.TEXT".

OSI.TXT/Asc Bytes: 38120, Count: 19, 28-Jun-85

Title : Lisa Pascal:INTRFC/OSINTF.TEXT
Keywords: SUPPLEMENT TEXT INTERFACES OSINTF LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be redistributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. This is a TEXT file, for MDS Edit. This is file "Lisa Pascal:INTRFC/OSINTF.TEXT".

MEMTYP.TXT/Asc Bytes: 1120, Count: 24, 28-Jun-85

Title : Mac Software Supp.:MEMTYPES.TEXT (OBSOLETE)

Keywords: SUPPLEMENT TEXT INTERFACES MEMTYPES MEMORY LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. This is a TEXT file, for MDS Edit.

This is file "Lisa Pascal:INTRFC/MEMTYPES.TEXT".

MACPRN.TXT/Asc Bytes: 22635, Count: 31, 28-Jun-85

Title : Source file for MacPaint example (OBSOLETE)

Keywords: SUPPLEMENT TEXT INTERFACES MACPRINT PRINTING LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. This is a TEXT file, for MDS Edit.

This is file "Lisa Pascal:INTRFC/MACPRINT.TEXT".

GRAF3D.TXT/Asc Bytes: 3145, Count: 142, 28-Jun-85

Title : Supplement file "Lisa Pascal:INTRFC/GRAF3D.TEXT"

Keywords: SUPPLEMENT TEXT INTERFACES GRAF3D 3D GRAPHICS LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. This is a TEXT file, for MDS Edit.

This is file "Lisa Pascal:INTRFC/GRAF3D.TEXT".

ABPASI.TXT/Asc Bytes: 10770, Count: 90, 28-Jun-85

Title : Supplement "Lisa Pascal:INTRFC/ABPASINTF.TEXT"

Keywords: SUPPLEMENT TEXT INTERFACES ABPASINTF APPLE TALK LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. This is a TEXT file, for MDS Edit.

This is file "Lisa Pascal:INTRFC/ABPASINTF.TEXT".

WRKNUB.APP/Bin Bytes: 3200, Count: 23, 26-Jun-85

Title : Software Supplement - WorksNub
Keywords: SUPPLEMENT DEBUGGER UTILITY WORKSNUMB LISA MACSBUG
OBSOLETE

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. See MACBIN.HLP (in DLO) for downloading information. This is file "5/85 MacStuff 2:WorksNub".

HDINST.APP/Bin Bytes: 20096, Count: 75, 26-Jun-85

Title : Supplement "5/85 MacStuff 3:Hard Disk Install"
Keywords: SUPPLEMENT APPLICATION UTILITY HARD DISK INSTALL LISA

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. See MACBIN.HLP (in DLO) for downloading information. This is file "5/85 MacStuff 3:Hard Disk Install".

WLWIN.WRT/Bin Bytes: 6784, Count: 19, 25-Jun-85

Title : Software Supplement - WriteIn Window 6/12
Keywords: SUPPLEMENT DOCUMENTATION MANUAL MACWRITE WRITELN
WINDOW LISA PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. See MACBIN.HLP (in DLO) for downloading information. This is file "SS Docs:WriteIn Window 6/12".

PASLIB.WRT/Bin Bytes: 11008, Count: 14, 25-Jun-85

Title : Lisa Pascal Paslib 0.7 documentation
Keywords: SUPPLEMENT DOCUMENTATION MANUAL MACWRITE PASLIB LISA
PASCAL

This file is part of Apple Computer's Macintosh Software Supplement. Unless otherwise specified within the file itself, Apple holds copyright to this file, and it may not be re-distributed without permission of Apple. See SS.INF, SSBYDL.CAT, SSBYSS.CAT, and SSTYPE.TBL for information on the Software Supplement files. See MACBIN.HLP (in DLO) for downloading information.

This is file "SS Docs:Paslib 0.7".

XLCOPY.BIN/Bin Bytes: 3712, Count: 250, 12-Sep-85

**Title : Disk Copy program for XL.
Keywords: MACINTOSH XL LISA DISK COPY**

A disk copying program designed for the MacIntosh XL (Lisa). The program will copy any Mac/Lisa formatted diskette under MacWorks preserving a maximum of the tag bytes (the middle 4 on the first sector the first 8 on all other sectors). The program can be used as a one pass copier on a 512K Mac. The program will do multiple writes of a disk making duplicate copies.

LTOMAC.BAS/Bin Bytes: 7296, Count: 56, 10-Nov-85

**Title : Convert Lisa disks to Mac files.
Keywords: MAC LISA FILE TRANSFER DISK CONVERSION UTILITY**

Mac to Lisa V1.1 is a utility to convert a Lisa Office System Diskette into a MacIntosh File for transfer by MacBinary. This utility is not a migration tool. Please see MACTOL.DOC for details.

MACTOL.BAS/Bin Bytes: 7040, Count: 39, 10-Nov-85

**Title : Mac to Lisa file conversion utility.
Keywords: MAC LISA FILE TRANSFER CONVERSION UTILITY**

Mac to Lisa Version 1.0. This utility converts a file image of a Lisa 7/7 Office System Disk created by Lisa to Mac Version 1.1 back to a Lisa Office System Diskette. See MACTOL.DOC for details. This is not a migration utility.

BITFXR.BIN/Bin Bytes: 5248, Count: 141, 30-Jan-86

**Title : Test pattern for the Lisa or Mac.
Keywords: BITFIXER ALIGNMENT ASPECT RATIO MAC XL**

This application draws a simple test pattern which allows you to check the aspect ratio (and linearity) of your Lisa, Macintosh XL or Macintosh screen. It can be used to align the BitFixer Aspect Ratio Switch in both the Lisa and Macintosh modes.

RESET.BIN/Bin Bytes: 1152, Count: 82, 16-Oct-86

**Title : Force cold boot on a Lisa.
Keywords: LISA MACXL XL REBOOT RESET RESETTER RESTART COLD BOOT**

A small utility (6 blocks) which forces the Lisa to do a cold boot. Useful for returning to 7/7 from MacWorks. Saves time and aggravation during migration. Cleaner than hitting the

reset button since the finder has a chance to clean up and save the latest version of the desk top. Will reboot a Mac as well.

XLSCRE.BIN/Bin Bytes: 6784, Count: 118, 03-Jan-87

Title : DA lets you set contrast, dim time, etc.

Keywords: LISA CONTRAST DIM SCREEN SHUT DOWN

This Utility (It is a DA) allows you to set the contrast, the time until the screen dims, the contrast at which the screen dims to, and lets you shut it down. It also lets you shut it down and after a specific time, TURN BACK ON! It is Shareware from Frederick Computer and Electronics Corporation.

2PORT./Bin Bytes: 26112, Count: 90, 17-Mar-87

Title : Use an extra Profile with Lisa/Macworks

Keywords: PROFILE LISA MACWORKS

2Port Disk Installer Program, Installs a Driver so an extra Profile or up to six may be used on the Lisa running under MacWorks. Packed with Packit III

XLINIT.BIN/Bin Bytes: 1280, Count: 102, 18-May-87

Title : Contrast and dim time settings at boot.

**Keywords: SCREEN DIM CONTRAST STARTUP FCEC FREDERICK SHUTDOWN
TIMER**

When used with XL Screen 2.0, allows automatic contrast and dim time setting for Lisa on boot. Your favorite settings can be set and XL screen can be removed to prevent tampering, if you wish. This is an INIT file which must be used with System 3.2 or higher. Just place it on your startup disk (in system folder w/HFS)

XLSCRN.BIN/Bin Bytes: 8320, Count: 99, 18-May-87

Title : Utility for setting contrast, etc. on XLs.

**Keywords: SCREEN DIM CONTRAST STARTUP FCEC FREDERICK SHUTDOWN
TIMER**

XL screen 2.0 is a utility for the Lisa/XL that sets the Contrast, Screen Dim Time, and contrast when the screen is dim. It also allows the Lisa to be shut down, and then turned back on at a pre-specified time, all by itself. This version includes Save and Restore commands, which give you the option of storing your favorite settings, and when used with XL Screen INIT, allow automatic contrast-setting on boot.

LISADA.TXT/Asc Bytes: 788, Count: 48, 01-Aug-87

Title : Lisa appointment calendar for Office System:info.

**Keywords: LISA TOOL OFFICE SYSTEM APPOINTMENT CALENDAR SOFTWARE
APPLICATION DATE LISADATE**

LisaDate is a new tool for the Lisa Office System 3.1. It has been in development for 3 years and is the BEST appointment/calendar application available for the Office System! This is info on how to get it.

HD20HI.BIN/Bin Bytes: 23040, Count: 94, 13-May-88

Title : How to get HFS on Mac XL's.

Keywords: HFS HARD DISK XL LISA HINTS HD20 JDM HN

This file is some hints for using the Hard Disk 20 file to get HFS on X/Lisas. It describes how to get out of trouble when your system is corrupted on your hard disk. You need the Sun Remarketing HFS product to actually use HFS on your Lisa. The get-out-of-trouble stuff is also useful on 512k un-enhanced macs. MacBinary II/MacWrite file dated 88/04/01. * Addendum and new format 88/05/08 * This information doesn't really apply to MacWorks Plus.

MWBUG.BIN/Bin Bytes: 25600, Count: 78, 04-Mar-89

Title : MacWorks+ v1.0.8 bug list

Keywords: MACWORKS BUG USER STARTUPSCREEN RAH

MacWorks+ v1.0.8 bug list, user list, and nifty StartupScreen.

LRAMBO.SIT/Bin Bytes: 63616, Count: 50, 10-Jan-90

Title : Schematic of the Apple Lisa 512k Ram board

Keywords: XL LISA RAMBO RAM MEMORY UPGRADE HARDWARE SCHEMATIC JDM

This is a reverse engineered schematic of the Apple Lisa 512k Ram board. Included are instructions for upgrading it to 2Mb (lots of work). Re-uploaded 90/01/10 in MacDraw II format.

L4MPCH.TXT/Asc Bytes: 730, Count: 28, 26-Mar-90

Title : Patch fixes some hangs at startup

Keywords: 4M XL LISA SCSI PATCH JDM

This is a system file patch for X/Lisa users who have modified their machines to use more than 2M of memory. This fixes the hang at startup which may occur if there is no SCSI port installed. Use at your own risk.

XLHPD.BIN/Bin Bytes: 1792, Count: 20, 18-Jun-90

Title : Patch for X/Lisa to fix Deskwriter Overrun error

Keywords: XLISA DESKWRITER HANDSHAKE INIT QUERY JDM PATCH

This is a patch for the X/Lisa to fix the HP DeskWriter Buffer Overrun problem. Requires MacWorks+ 1.0.18 or 1.1H. INIT for your system folder. This version is free. Copyright 1990 Query Engineering Inc. All rights reserved. Development of this version funded by Sam Hoffman with our thanks. Use at your own risk.

CHAPTER EIGHT

MACUSER/MACWORLD INFORMATION

This chapter contains information originally published in 1984 and 1985 in MacWorld and MacUser, the two long standing Macintosh computer magazines.

MacUser
Review of XL/Serve
November 1985 (Page 37)
By Dennis Brothers & SB

XL/Serve makes a Mac XL the key player in an Appletalk network. This program, which runs under Macworks, turns the XL into an efficient volume and printer server.

The volume server feature allows AppleTalk users to access any one of up to sixteen volumes. Each volume can be password protected so that critical data can be protected. Volume partitions are adjustable by the manager function. File storage is efficient with allocation block sizes ranging from 2 to 8K, depending on the volume size.

The print serving feature allows all the users on the network to speed up their printing. When a print command is issued the document is rapidly sent to the print buffer established by the XL/Serve and the sending unit is immediately released. Users no longer have to wait for printing to end before they can start working again. XL/Serve then prints the document without further user involvement.

The Mac XL that is the base for all of this activity remains fully useable. XL/Serve's operation are transparent to the XL operator. XL/Serve seems to make fewer demands on the system than other file (volume) servers.

The program is well documented and has on-screen help. It is easy to install and use. Each user installs the XL/Serve driver as a desk accessory so calling and changing volumes is simple.

There are a few bugs. Word spacing when the print spooler is producing output is not always correct or attractive. This flaw is as much a fault of Macwrite as it is of this program. The print spooler does not support the LaserWriter. However, since users are on AppleTalk, they can address the LaserWriter directly.

Among the most useful features are print spooling and incremental saving of files. The incremental saving feature keeps track of when files were last backed up and only copies changed files when a backup is made. This feature is a real time saver.

Users must be sure to have MacWorks 3.0. XL/Serve will refuse to even load with earlier versions. The publisher is aware of this problem and a fix should be available by the time you read this.

XL/Serve should be high on the busy list of every AppleTalk network that has a Mac XL. It is an excellent product.

Answers from the Mac Team

May 1986

In a Macintosh XL's Get Info widow, there is a discrepancy between the number of bytes in a file and the number of K that same file occupies. Sometimes the difference is dramatic. What's up? These Macintosh XLs do NOT share disk space with Lisa software and have all the correct and current software.

This is true not only of the Mac XL but the Macintosh also. Many files have invisible files associated with them. These invisible files are included in the overall file size; takes up less space and this is what is noted in the Get Info... dialog.

Also, there is a minimum block size of 4K allocated on the XL for files, which in many cases, is much larger than the actual file. On the Mac the minimum block size is only 1K, while HFS, which the new Macintosh uses, has a minimum allocation block size of 512 bytes, or 0.5K.

August 1986

I'm currently running a Mac XL with the internal 10-meg hard drive. Normally I start up the machine for the day's work each morning. I try to just let the machine run the entire day till the office closes. I've heard some people say that it is better to let the drive run constantly...right through the night! What is the ideal operating procedure for hard disk users? How much potential damage can occur by turning the machine on and off a few times a day? My objective is to treat the machine with the best possible care to extend the life of the components. Please help!!

I referred this question to Al Zisser, our product manager for the HD-20 and hard drives. Al says that the stress on the mechanical and electrical components incurred by powering on and off several times a day is far worse than the wear subjected by leaving the machine on all day. At Apple we leave our disks on pretty much 24 hours a day. I doubt that there is one perfect solution for all brands of hard disks, but for both the XL and HD-20 we recommend that you restrict the number of times you power on and off the device as much as possible. It won't hurt the machine when you come in and power off when you leave at night. But for optimum drive life, it's probably best to turn it off only when you know you won't be using it for 3 to 4 days.

TIP SHEET

June 1986 (Page 126)

When you move an Excel document from a Mac/XL to a Mac, the window is larger than the new screen display. There's an easy way to scale things down to size, though. Just click twice on the window title to bring the screen down to new proportions.

Here are two tips about the OPTION key. One is to hold down the OPTION key and push the power button. It will reboot the XL and then it will ask for a floppy disk. Second you can hold down on the OPTION key after the memory test and it will allow you to boot from a floppy disk.

August 1986 (Page 114)

Holding down the APPLE key while pushing the XL's power switch will restart the machine from the hard disk and return you to the desktop. Using this technique avoids having the (sic) reload MacWorks into memory. Hold down the OPTION key, push the same power switch, and the XL will boot and prompt you for a floppy disk to start up from.

The Help Folder
February 1989

Why is it called the Macintosh? And who was Lisa?

In the early days, there were two major themes for project names: feminine names and varieties of apples. For example, there were projects named Annie, Sara and Lisa, as well as Pippin, Golden Delicious and Macintosh.

Jef Raskin, originator of the Macintosh project, says he picked the name because it was his favorite kind of Apple. (And it was Jef who misspelled it--the apple is called McIntosh--but the name stuck anyway.) It was always expected that the names would be changed before the products shipped. The Lisa was to be called the Apple IV, (following the I, II, and III).

But both teams were fiercely loyal to their project names, and both names stuck. There was one attempt to make the names mean something. Lisa was supposed to be Locally Integrated Software Architecture, and at one point Macintosh was shortened to Mac, for Mouse Activated Computer. These quickly degenerated into Let's Invent Silly Acronyms and Meaningless Acronym Computer.

So in the end it was just easier to ship them with the names we knew them, by and teach people what the names meant. It seems better than calling it the Zipchip ZX8000.

MACWORLD

Macworld View
May/June 1984
New Life For Lisa

According to many dealers, the Lisa 2 line is Apple's answer to the negative reaction customers have to the Mac's 128K memory and one disk drive. Keith Sharp of the

Compushop of Georgia in Atlanta explains the boost in Lisa sales: "People who liked the Lisa technology were scared away by its price. Now they see this technology in a \$2,500 machine, and then they say they need more memory and a hard disk. After comparing benefits and features, they're more willing to pay the price.

July/August 1984
Lisa 2 and MacWorks

One way to add muscle to Macintosh software is to run it on the Lisa 2. Now that MacWorks, the program that enables the Lisa 2 to run Mac software, has been released, Lisa owners can run applications that require up to a full megabyte of memory and take advantage of the Lisa's larger screen. MacWorks accesses the profile drive of the Lisa 2 and the hard disks of the Lisa 2/5 and Lisa 2/10. At press time, Randy Battat, Lisa product manager, indicated that a new version of the Lisa Office System is also being developed. The update will offer functional enhancements to each application and more integration between applications.

September/October 1984
Lisa 2 Miscellany

Sales for the Lisa 2 product line are outstripping Apple's production capacity by a margin of two to one, with the Lisa 2/10 commanding two-thirds of the sales. Lisa product manager Randy Battat says, "We can't build them fast enough." Apple expects to be able to meet the demand by the third quarter of 1984.

Many retailers are touting the Lisa as a big Mac, an assertion that will have more validity when Apple provides access to the Lisa 2/10's hard disk with MacWorks. Software developers are adjusting the distortions in the Mac and Lisa screen sizes; Microsoft Chart automatically compensates so that a pie chart looks round (not oval) on the Lisa screen.

Running Mac software on the Lisa gives you access to more memory than on a Mac. In a Macwrite document written on the Lisa, you can store eight times as many pages per document as with the Mac. The Lisa screen size allows users to see 50 percent more information. Although the Lisa's full screen is not used by MacPaint, with MacDraw the Lisa displays four times as many objects as the Mac does.

Apple is preparing enhancements to Lisa software. You will be able to cut and paste graphics into Lisawrite documents, cut and paste between LisaList and other applications, and between LisaTerminal and other applications. LisaWrite now includes a spelling checker, LisaProject has a job cost program, and LisaDraw supports color output for the Canon inkjet printer and reduced fit (the ability to scale the size of a design on the screen).

May 1985
Voila! A New Product

The Lisa 2/10 has been renamed the Macintosh XL. Apparently Mac shoppers have been asking dealers for a Mac with a built-in hard disk, a larger screen, and the capability to

handle multiple tasks. The Lisa 2/10 offers these design features, but the computer is not well known to Mac dealers or owners. The Macintosh XL comes with a 12-inch screen and 512K of memory expandable to 1 megabyte. A built-in hard disks offers up to 10 megabytes of storage space, which means that XL owners can build larger databases and spreadsheets and run other applications such as UNIX-based programs. Although the other two Lisa models, the Lisa 2 and the Lisa 2/5 will be phased out, Apple has designed software that will allow Lisa owners to transfer files created with the Lisa 7/7 business software to Macintosh applications.

Letters to Macworld

October 1985

Lividly Losing Lisa

The clamor for a hard disk Macintosh confuses me. I can understand a Mac owner wanting a “factory” hard disk, but the Lisa and the Macintosh XL are hard-disk computers. Not once have I seen a mention of this fact in your magazine. Just in my novice period with the Lisa I’ve come to love its hard disk. I can’t imagine having a computer without one. For my small business, adding to a Macintosh to build a business system could be a nightmare. Don’t mistake my feelings about either the Macintosh or Apple Computer. I have every hope (rather, no choice) to expand my system with the Macintosh units, married to the Lisa, of course.

The “new” MacWorks software for Lisa has been promised for a long time but still hasn’t arrived. The conversion chip to solve the screen distortion has never arrived either. As far as I know, no Macintosh software is compatible with Lisa’s 7/7 business system. It’s a shame that such a tremendous work horse is shunned by magazine and manufacturers alike. The child Lisa bore is its demise.

December 1985

I Love Lisa

If Larry Tesler felt pangs when Lisa, a.k.a. Macintosh XL, production terminated, I and, I believe, thousands of other Lisa users suffered heartbreak [Note Pad, Macworld, September 1985].

My company, Group 4 Construction Project Services, and its affiliates own eight Lisa computers and five Macintoshes. We have well over 50,000 labor hours invested in those machines, both in our construction business and as a software developer. The power and ease of use of the Lisa continue to amaze me, even after two and a half years of continuous use.

As great a machine as the Macintosh is, our training period for employees is much shorter and the productivity of our staff is far greater with the Lisa Office System.

Tesler’s group developed the most significant operating system for the office since the

introduction of personal computers. He and his colleagues should be praised for brilliant work. For our applications, the Macintosh is a compromise on the issue of productivity. We are optimistic, however, that the Lisa's true legacy will be a Lisa-class computer within the Macintosh product line.

Macware News
July 1985

RamStak: A memory expansion board for the Macintosh XL. Two model of the board are available: one model provides 512K of memory using 64K DRAM chips; the second model, which uses 256K DRAM chips, is available in configurations providing 512K, 1 megabyte (MB), 1.5MB and 2MB. Boards with less than the full 2MB have empty sockets, allowing additional 256K DRAM chips to be added. Included with the RamStak boards that use 256K chips are utilities that allow MacWorks and the Lisa Pascal Workshop to use 2MB of memory, since without modification, these operating systems cannot use more than 1MB. List Price: 512K model \$895, 1MB model \$1,495, 1.5MB model \$2,095, 2MB model \$2695; upgrade kit for adding 512K to the RamStak board \$500. AST Research.

Quick Tips

Preserving the Lisa

At my company, there are many original Lisas with 5- and 10-megabyte hard disks. Is there a way to work with Mac files on the Lisa? We are planning to set up Mac systems throughout our department, but would like to preserve our sizeable investment in their predecessor.

A Lisa 2/5 or 2/10 becomes a Macintosh XL when you use MacWorks XL software. The Macintosh uses the standard Macintosh File System file version 3.2 and Finder version 5.3. mac software can take advantage of the 12-inch screen, 2 megabytes of memory, and the hard disk. You use the hard disk solely for Mac software or share it with Lisa 7/7 software. MacWorks XL gives you access to the AppleTalk Personal Network and the Laserwriter.

Although many Mac applications run on a Mac XL, not all do. Text and pictures appear somewhat taller on the XL screen unless you have the video circuitry modified, but they print OK. Also the cables and connectors are different from those used by other Macs.

Unfortunately, Apple has not distributed MacWorks XL since 1986. However, you can get it from Sun Remarketing (P.O. Box 4059, Logan, UT 84321, 801/752-7631), which makes a business of selling complete Mac XL (née Lisa) systems. Another \$30 will get you a version of MacWorks with HFS compatibility.

CHAPTER NINE

BUYING A USED LISA/MAC XL

The Skeptical Consumer's Guide to Used Computers

1985

Edward Kahn and Charles Seiter

Lisa

Apple Computers are both machine and myth. Perhaps no company in the last quarter century has the romance that Apple carries with it. Two guys who love computers literally start an empire in a garage. The appeal of the story is that these two guys are really hackers and stumble onto a design and philosophy that meet the needs of millions. Beginning by designing a product for himself, Steve Wozniak finds that fellow hackers in the Bay Area are anxious to buy his basic board. Soon an investor has become interested in taking these guys into the big time. David indeed has taken on goliath (IBM). But how do you follow an act like that? The Apple II family was aging and the competition was coming from all sides. One of the problems in the high-tech business is that if you come out with a really great product, the big guys don't even thank you for testing the market but proceed to crush you. Apple was still doing well with its line of computers but knew that there had to be a second act if there was to be any future. The result was an ill-timed release of the Apple III. The problem was not that it was not compatible with all of those IIs out there and more importantly, it got off to a bad start with a premature release. The result was bad press and not much acceptance in the marketplace.

The pressure was really on. Apple was determined not to repeat that mistake. So for more than a year rumors spread about the new product code-named Lisa. Nobody knew what it was going to be, but everybody was sure that it was not going to be another fiasco or Apple's shine would be gone forever. Finally, in early 1983 Apple announced two new products: the successor to the Apple II+ called the IIe (reviewed elsewhere) and the Lisa. Lisa was both a disappointment and a success. The disappointment was that this machine was well beyond the reach of most of Apple's customers; it was released in one configuration only with a list price of nearly \$10,000. The hackers had been left behind on this one. The excitement was that this computer came closer than anything that had been previously released to meeting the expectations of a non-computer-oriented public. It was truly user-friendly. Within a half hour a busy business executive could be using Lisa. And it certainly was not true that the Lisa sacrificed muscle for ease of use. No, this computer was truly on the leading edge of computer technology.

What Lisa offered for \$10,000 was a machine with a huge one-megabyte memory and two internal floppy disks as well as a 5-megabyte hard disk. In addition the Lisa package included six application programs: word processing, calc, database, graphics, communications, and a project manager. Each of these was excellent in its own right and also was fully integrated. This meant that you could take text from a word processing program and pop it into a graph that you were creating. There were a few bugs in the system which Apple promised to correct--and did.

So what happened to this machine? At the time it came out we felt that Apple's future looked dim unless they could come out with a machine at a quarter the price of the Lisa that would do everything that Lisa did. The next machine Apple introduced was the Macintosh. Mac didn't match Lisa exactly. For one thing it did not have nearly as much memory, and for another thing, it had a 9-inch screen rather than a 12-inch viewing area. In fact, when you got right down to it, there were lots of differences. But the similarities were great enough to put the future of the Lisa in jeopardy. Simultaneously, with the introduction of the Macintosh, Apple released an upgraded Lisa called Lisa 2 in two configurations: Lisa 2 and Lisa 2/10, the latter including a 10-megabyte hard disk. Apple converted all of the earlier Lisa's at this time free of charge into the newer configuration of the 2. The change included replacing the 5 1/4-inch disk drives with a single 3 1/2-inch disk drive like that used on the Macintosh. The Lisa would now run all of the Macintosh software, but keep its own unique capabilities as well.

The upgrade also brought a reduction in price. The Lisa 2 now had a list price of \$3,500, so in some ways it seemed a better buy than the Macintosh. But the future of Apple is clearly with the Macintosh. Apple has tried various schemes to keep the Lisa alive, and certainly it is not an inferior product. Lisa lovers around the world will tell you that it is the best Apple computer that has ever been built, but our verdict on it as a used machine is mixed because we don't know how long you can count on support for it.

Critical Reaction

The market's initial response to a computer has a tremendous bearing on the extent of its Initial Plunge. Compare the Initial Plunges shown in Figure 3-3, of the IBM PC and the Apple Lisa. The introduction of the PC legitimized the personal computer market, and the PC's Initial Plunge was modest.

At the Apple Lisa's introduction, critics heralded the computer as an exciting departure in personal computer architecture but thought it was vastly overpriced. The Lisa's Initial Plunge was steep-it lost more than 50 percent of its new retail value.

DEC touted its Rainbow computer as a technological breakthrough with the highest performance/price ratio on the market, but the Rainbow was not quite compatible with the IBM PC standard.

One year after IBM had established a generic technology with the PC, DEC tried to push a proprietary system. The Initial Plunge of the DEC Rainbow was a whopping 40 percent, disheartening for anyone who paid the list price of \$3,495 in 1982. Wang ran into the same compatibility trap with their PC, and the machines lost more than 40 percent of their original value when they hit the secondary market.

PHASE 2. GRADUAL DECLINE

After the Initial Plunge phase, a computer's value erodes gradually to its Base Value and, ultimately, its scrap value. At the end of the Gradual Decline phase, the computer will have lost about 90 percent of its original retail value. The slope of the decline is determined by a number of factors that either slow or hasten the computer's loss in market value,

Factors That Slow the Gradual Decline in Value

Both the manufacturer and third parties can contribute to a computer's holding its value through the Gradual Decline phase.

Manufacturer's commitment. The manufacturer's plans to produce the computer or variations of the computer (as well as spare parts) over time have a major impact on how long a particular machine retains its value. For an instance of exemplary commitment, look at the Apple II family. Apple continues to manufacture variations of the original Apple II and to enhance the original "Wozniak design." And the corporation continues to offer replacement parts for the original machines.

In stark contrast are the fates of the Apple Lisa, the Apple III, and the IBM PCjr, orphaned soon after their rejection by the marketplace. Apple dropped the Lisa and the Apple III and IBM abandoned the PCjr, leading to an instant decline in the used market values of those machines.

The End