

Review of Apple Lisa computer and the last
Lisa Office System version (3.0 or "7/7").

Reviewed by David Redhed of
Seattle Washington.

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Clear Skies Consulting

Personal Computer Problem Solving in Any Weather

David D. Redhed
712 35th Ave, Seattle Wa. 98122
(206) 325-9670

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Lisa 7/7

The Completion of Apple's Great Software Gamble

Apple has finished the Lisa Office System. Four years after the start of the Lisa development project Apple has released the "final" version of the Office system. They tried something that is almost without parallel in the computing industry, and especially in the personal computer industry. Probably only Apple, among the dominant microcomputer manufacturers, could and would try such a risky and wonderful thing. They sought to develop a totally different kind of personal computer system as an integrated whole -- hardware and software coming into existence simultaneously.

Have they been successful? Did they achieve the goals they had in mind? Did they pick the right goals? Has the marketplace responded positively? Since all the votes are not in, it may be too early to judge fairly, but I think that this product deserves a long, hard look by everyone in the market for a business system. The final release is called Lisa 7/7 and is being sold for the very competitive price of \$695.

A Brief History

For those who have not followed the Lisa developments closely I would like to give a synopsis of the last four years. Some of the historical information that follows is extracted from an article by Gregg Williams in the February, 1983, Byte which recorded an interview with three key members of the Lisa project. The Lisa project began with some design work around mid-1980, but the majority of the staff was hired about 6 months later. Since neither the hardware nor the software existed, a considerable period of time was required to get the 90-plus people working together and communicating

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in an effective way. Larry Tesler said that they "spent a year building the team and a year building the product".

They took the first 6 months to pin down the user interface specifications. All the other elements of the system were made to fit the demands of the user interface. Because the hardware, the operating system, and the applications were developed in parallel, there was a lot of iteration between the various development groups. This was the most challenging part of building a team that could really work together.

This system was larger than any other software that Apple had ever developed. The code required to support the applications took 10 megabytes in source form and 1/2 megabyte in object form. Most of this code is directly linked to user interface specifications which are common to a broad set of application programs.

Although the Lisa was formally announced in February, 1983, the first shipments to dealers did not occur until July. The hardware and software, which included the operating system and six applications, were sold as a single package for \$9995. A seventh application for terminal communications was released in the fourth quarter of 1983. Also in the fourth quarter Apple unbundled the software from the hardware and dropped the computer hardware price to \$8300. At this point you could buy the applications singly, although they offered a substantial discount if you bought all of them together.

The I/O to the hard disk was quite slow in initial release of the software. In the first quarter of 1984 Apple released version 2.0 of the system and offered the Lisa in three new models. The new software version improved the I/O speeds considerably and all buyers of the original system received this release at no charge. The three new models were called the Lisa 2, 2/5, and 2/10, and were priced at \$3495, \$4495, and \$5495, respectively. All three models had just 1/2 megabyte of memory; the only difference between them was the amount of hard-disk storage: 0, 5, or 10 megabytes, respectively. While the applications developed especially for Lisa would not run in 1/2

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megabyte, UNIX and Xenix were to be available in versions that would run in 1/2 megabyte of memory. The extra 1/2 megabyte of memory cost \$1495 at the time, so there was some incentive to have the option.

The new Lisa models all used the Sony 3-1/2" microdrive, requiring a conversion of all the original Lisa computers. Dealers converted the drives for Lisa owners at no charge as long as it was completed before June, 1984. This rather expensive operation was required because Apple had decided to stop making their own disk drives, and they wanted to have diskette compatibility between Lisa and Macintosh.

A Lisa 2/5 with the extra 1/2-megabyte of memory costs \$5990 and is equivalent to the first model of Lisa, originally priced at \$9995 and subsequently dropped to \$8300. The Lisa 2 (no hard disk) was offered primarily as a vehicle for running Macintosh software on a large memory system. The Lisa 2/10 offered both more hard disk storage and the convenience of a built-in drive instead of the external Profile.

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

Apple emphasizes that this software package is now complete. Quite clearly they want people to stop asking when they are going to add more functions to the Desktop environment. They do not plan to add anything to it. One of the big questions is, "Will anyone else add anything to it?"

Because Lisa was designed from the ground up as a unique system, special problems arise for third-party developers. The operating system was new and different, since it was custom designed to support the design goals for Lisa. With 1/2 million bytes of object code in the underlying support system alone, the days are past when you can spend a couple of weeks (or months) with a disassembler and figure

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out how to install your own applications. I do not think Apple anticipated the problems they would face in getting third-party developers equipped to develop applications for Lisa. Macintosh has suffered some of the same problems, and for some of the same reasons.

Such are the difficulties of building a system that is not merely a refinement of existing hardware and software. While many manufacturers are trying to make the perfect IBM PC clone, Apple has chosen a distinctly different route. Lisa is not just another computer with a flashy graphics screen.

A Truly Different Design Philosophy

Lisa is a system that has to be used extensively before it can be appreciated. Telling people about Lisa's important differences will only cause your credibility to drop because they will not believe you. Whether or not they want to agree that Lisa's attributes are valuable is another matter. Lisa really is different; trying to explain how it is different is something like convincing a fish that it is possible to breathe without gills and water. Demonstrating the system is some help, but not a lot. There is always the nagging question, "Can something that looks so gimmicky really do any serious work?" While I am sure there must be some people who have tried Lisa and really don't like it, I personally don't know any one who has spent several hours doing real work on Lisa and come away with negative conclusions about its value.

Now that I have made it clear how very difficult it is to tell people about Lisa, I am going to try once more to do it. (Without this kind of determination how would software developers ever start on another program?) What I am going to give you is my understanding of the system after a year of steady work with it.

There are two primary differences between Lisa and its competitors:

- (1) the hardware and operating system software were designed to support integrated applications, and

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(2) manipulation of graphic images forms the basis
for the user interface.

All of the other popular integrated programs have been implemented on general purpose operating systems running on general purpose hardware, neither of which were designed specifically to accommodate integrated applications. I am not saying that programs running on these systems are poorly done or ineffective. What I am saying is that they are working under several handicaps which the Lisa designers eliminated.

Lisa's graphic images are not used just to make things look nice, but primarily to take advantage of something possessed by all people who are not vision-impaired -- a natural ability to relate easily to objects we see. When we are working, we are constantly reaching for objects, moving them around or scanning our field of vision to spot something we need. When we look for something which we can easily recognize, we are able to ignore most of the objects in our field of vision immediately because they don't look anything like the object we are after.

By contrast, most computer systems ask you to describe what you want with keyboard characters arranged according to certain syntax rules. The primary reason that these kinds of systems dominate the market place is historical, not because they have been judged to be superior. Up to just a few years ago, displaying characters has been the only reasonably economical way to build a computer terminal interface. Today, high-resolution, bit-mapped graphic displays are within reasonable cost limits, making some different approaches very practical. To this hardware Apple has added some truly remarkable graphics software which can satisfy the speed requirements of the user interface.

I do not mean to imply that these two aspects of Lisa are the only important ones. What I want to get across is that Lisa is the result of a total system approach to deliver integrated functions with a consistent and high quality user interface.

The Lisa 7/7 Functions

The seven functions available in Lisa 7/7 are intended to cover all the common activities in the business office, with the exception of accounting. Below is a brief summary of the capabilities in each of the seven functions:

LisaCalc - spreadsheet calculations

- 255 by 255 matrix
- natural order evaluation
- up to 126 data digits visible across the screen
- each column may have a different width
- calendar date calculations
- locate circular references

LisaDraw - drawing geometrical and freehand images

- especially suited to presentation graphics
- color output to color printer
- maximum document size is 4 feet by 8 feet
- will print along either axis of paper
- images are kept in mathematical form and can be easily edited and re-sized
- option to reduce the document to fit the display screen

LisaGraph - graphing discrete data values

- Table of values is the same size as LisaCalc (255 x 255)
- 7 graph types (point, line, bar, stacked bar, 3-D bar, pie, area)
- option to display linear regression line & correlation coefficient
- full page, half page, and quarter page graphs
- color output to color printer
- option to reduce the document to fit the display screen

LisaList - two dimensional table management

- elementary form of a relational data base
- 8 data types (text, number, social security, zip code, date, time, telephone, money)
- sort list on multiple columns, ascending or descending
- 6 criteria for searching the list (same as, different from, up to, up to and including, after, after and including)
- columns may be added or deleted
- any columns may be hidden from the display

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- very limited printed reports (table form only)

LisaProject - project scheduling & costing

- scheduling is done via a Pert-chart-like diagram using tasks and milestones
- resource and task bar charts and task cost chart are derived automatically from the schedule chart
- early start, early finish, late start, and late finish displayed for each task
- critical path calculated and displayed
- maximum of 5 labor resources on each task
- fixed costs may be specified for each task
- weekly schedule and holidays can be specified
- option to reduce document to fit display screen

LisaTerminal - communications to other computers

- supports XON/XOFF protocol
- 110 to 19,200 baud
- dialog is kept in a window which can be scrolled backwards
- numerous customized set-ups can be retained
- multiple connections can be maintained simultaneously and the user can switch back and forth between them

LisaWrite - word processing

- document size limited by disk storage
- spelling checker with 80,000 word dictionary with 750 words of private dictionary entries
- multiple type sizes (8 point, 20 or 15 pitch; 10 point, 12 pitch; 12 point, 10 pitch; 12, 14, 18, and 24 point proportionally spaced)
- on-screen rulers for horizontal and vertical page adjustments and margin settings
- search facilities include case and wild card options

Figures f1 through f9 contain samples of printed output and screen displays from the various functions of Lisa 7/7.

Viewing Lisa 7/7 As An Integrated Program

The Lisa 7/7 functions are integrated in three distinct ways: The user interface is common to all functions, data can be transferred between the various functions, and you can suspend activity in one function and activate any of the other functions.

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A very critical feature of an integrated program is uniform conventions for the user interface throughout all functions. In this department Lisa really excels. Text-editing conventions are identical across all functions and in all circumstances. Whether you are naming a document, entering text in a document, or supplying a set of characters to use for searching through the text of a document, you edit text in exactly the same way. The pull-down menus of Lisa are used in all functions and always operate the same way. When the same menu entries are used in more than one function, they always behave in an identical manner.

Transferring data between separate functions is required if an application claims to be integrated. The various data transfer paths which exist between the functions of Lisa are shown in Figure f10. Figure f11 shows the three primary data formats which each of the various functions can create, receive and/or send. One of the most important features is the ability to take graphics from LisaDraw, LisaGraph, or LisaProject into LisaWrite. Note that a copy of the data is always moved so that two documents do not share the original data.

As you study Figure f9 you will see that two-stage transfers cannot violate the direct transfer capabilities; e.g. you cannot transfer graphics into LisaWrite and then transfer the graphics into LisaTerminal. LisaTerminal will not receive graphics, regardless of the source of the graphics.

The third important aspect of an integrated program is the ability to switch quickly between the various functions. The more time and effort required to switch between functions, the more the program looks like a collection of stand-alone programs. Lisa's ability to switch quickly between programs is a direct consequence of the multi-tasking operating system. When you switch to another function, the current one is just de-activated in its current state. No matter how long you stay away or how many other functions you activate in the meantime, returning to the original function will recapture the state at which it was interrupted.

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This 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 very difficult to achieve with conventional micro-computer operating systems.

Figure f12 is a screen display of three windows belonging to three different functions of Lisa 7/7: LisaDraw, LisaGraph, and LisaWrite. The dark shading around the name "Floor Plan" indicates that this is the currently active document which is 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 the LisaGraph document is closed and a different LisaGraph document 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 with fairly large documents (15 to 25 pages) will cohabit memory without requiring significant swapping to the hard disk.

I do not know of another integrated program which has as diverse a set of functions, and it is even more impressive when you consider the ease of information transfer and speed of switching between functions. Some of the other integrated programs may be able to match Lisa's speed for a smaller set of functions, but they cannot match its sophisticated user interface. From a price standpoint, it

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only makes sense to compare Lisa with other hard disk systems and it will be difficult to find anything to compete seriously for the \$7300 price tag of a one-megabyte Lisa 2/5, a printer and Lisa 7/7 (\$5990, \$595, and \$695, respectively).

Release 3.0 – What's New?

For those who are familiar with release 2.0 of the Lisa Office System, I will summarize the major enhancements which come with release 3.0.

General improvements

- a new menu called "Desk" that gives menu access to all items set aside and all open folders and documents
- revised printer set-up logic with a "Print As Is" option
- multiple print files will be stacked and processed in order
- two printers will run simultaneously
- alternative device drivers may be installed
- reorganized font and point size selection with a new 14 point font

LisaCalc

- several new functions including internal rate of return, locating circular references
- natural order evaluation
- display of storage requirements and re-calculation time
- option to print with any combination of headings, grid lines, and row and column titles

LisaDraw

- color output to a Canon PJ-1080A color printer (\$795)
- rotate, flip horizontal & vertical
- pen patterns
- reduce to fit, reduce 70%
- print up to 11" boundary

LisaGraph

- color output to a Canon PJ-1080A color printer (\$795)
- stacked bar, solid bar, and area graphs
- linear regression, correlation coefficient
- ability to add text anywhere on the graph

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LisaList

- nothing beyond increased integration

LisaProject

- ability to specify resource costs
- project costs displayed on resource and task charts
- task cost chart
- fixed task costs

LisaTerminal

- nothing beyond increased integration

LisaWrite

- spelling checker with 80,000 word dictionary
- 750 words in user dictionary extension
- increased use of keyboard equivalents of the menu selections

Will Lisa Go The Way Of The ///?

Prior to the announcement of Lisa 7/7 at NCC, a lot of people were noticing an ominous similarity between what was happening with Lisa and what has happened to the Apple ///. The NCC announcement seems to indicate that Apple is serious about Lisa, but I am sure that some doubts remain.

There is a definite outward expression of commitment on Apple's part, but some of their actions undermine their words. Why was it necessary to totally drop support of the Toolkit instead of reducing its support and development? Why is nearly all the 32-bit product advertising oriented to the Macintosh? Why the big push to tout Lisa as a "big Macintosh"?

I have no inside information about Apple's "real" plans for Lisa. My experience with Apple so far would lead me to believe that there is no formal plan to sink Lisa or see that it slowly die. Neglect is much more likely the dominant factor. In spite of the fact that they talk about a "family" of 32-bit computers, they do not seem to be able to focus on more than one thing at a time. Right now that is certainly Macintosh. Somehow they lost their grip on AppleNet and

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now they are talking about AppleBus. I believe that sometimes we credit them with too much purpose and foresight. They have done some really great things, but most of them have been technically based. They do not have anywhere near as good a record with their marketing accomplishments (although you do have to give them credit for the earthquake during the //c announcement).

The Lisa owners do have one thing in common with /// owners -- they really love their computers. I believe that Lisa will stand on its own and I hope that in the future Apple will put a little more behind their talk of a 32-bit family.

Conclusions

Lisa 7/7 is a very powerful integrated package for a price that is almost too low to believe - \$695. With a Lisa 2/5, the extra 1/2 megabyte of memory, and a dot matrix printer, the total system price comes to about \$7300. If the functions in Lisa 7/7 satisfy your requirements, there is not a better buy.

The one obvious drawback is that there is very little additional software available and very little in development. Using Lisa as a "big Macintosh" is one way to get double use out of the computer, but then the advantage of an integrated system disappears. You can use Lisa for a number of other things (as outlined in the companion article called "Lisa, The Premier Apple"), but none of them will integrate with the office system and several of them will not even cohabit the Profile with the office system.

Did Apple's gamble pay off? Most assuredly the microcomputer industry has benefited greatly from Lisa. Also, virtually every Lisa owner likes what he has and wants even more applications on the Desktop. Surely Macintosh would not be what it is today if it were not for the Lisa development. From a marketing standpoint, Lisa is not the success that was hoped for, so it is likely that Apple's goals have not been met. My thoughts about Lisa's future are summed

Figures

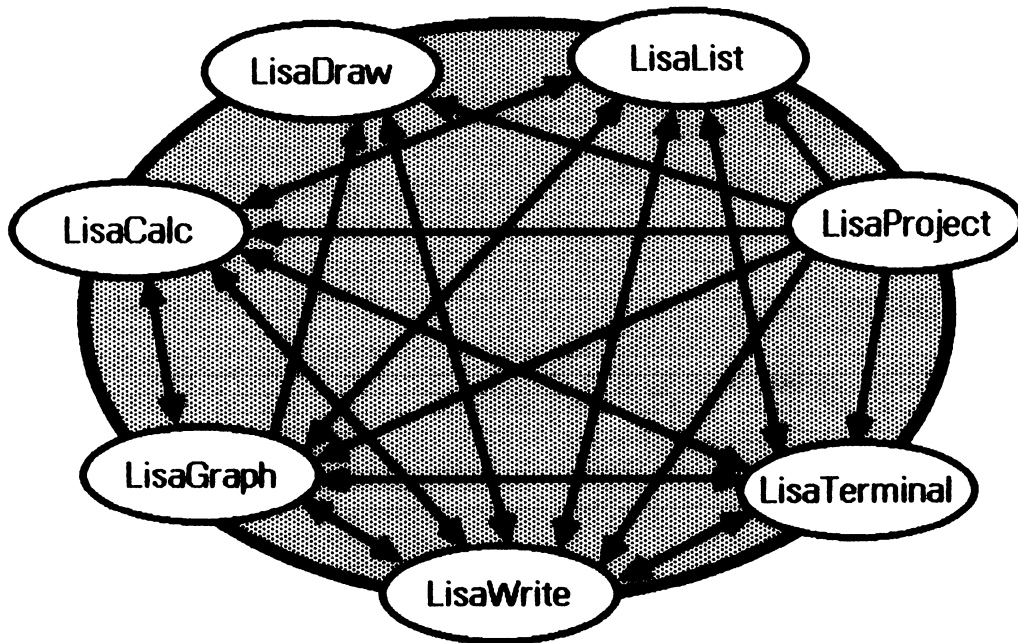
- f1** — A screen display showing the maximum number of columns that can be visible at one time on a LisaCalc spreadsheet
- f2** — Two samples of LisaDraw output:
(a) A sample of black and white LisaDraw output
(b) A screen display with colors indicated
- f3** — A sample of color output from a LisaWrite document which contains graphics pasted in from LisaDraw and LisaGraph
- f4** — Samples of several kinds of graphs from LisaGraph
(a) A stacked bar graph
(b) A solid bar graph
(c) An area graph
- f5** — Three different kinds of charts from LisaProject:
(a) A schedule chart
(b) A resource chart
(c) A task chart
- f6** — A screen display of the setup for LisaTerminal.
- f7** — A portion of a LisaWrite Document with the margin ruler displayed on the screen.
- f8** — This diagram indicates all the allowable data paths between the Lisa 7/7 functions (without regard to data format).
- f9** — This table lists the functions which will create, receive and send the three data formats of Lisa 7/7.
- f10** — A screen shot of three windows representing the three functions of LisaDraw, LisaGraph, and LisaWrite. LisaDraw is the currently active function, as indicated by the dark border around the name "Floor Plan".



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	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
LisaTerminal	Receive Send	Receive Send	
LisaWrite	Create Receive Send	Create Receive Send	Receive Send

Text = one or more 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)