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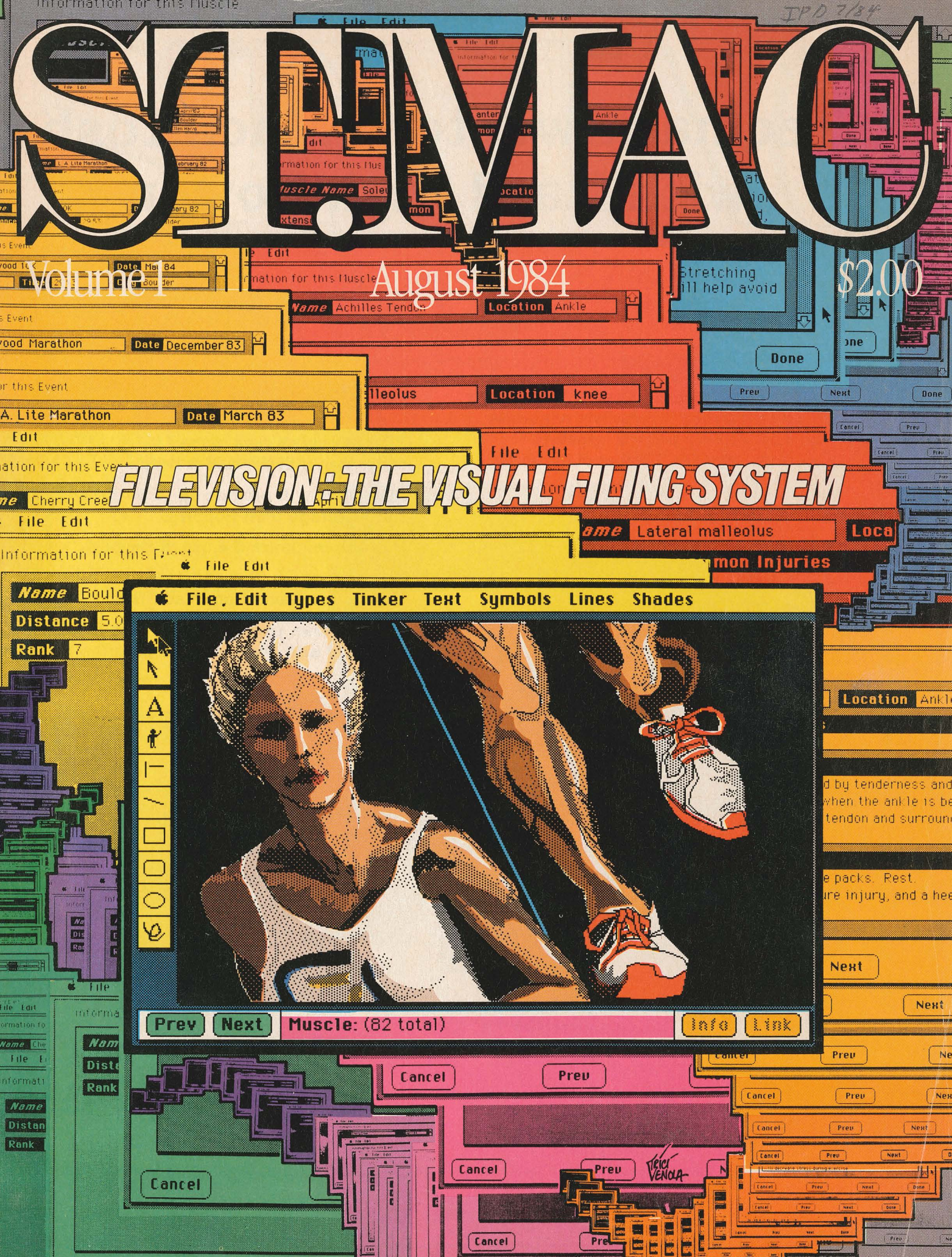

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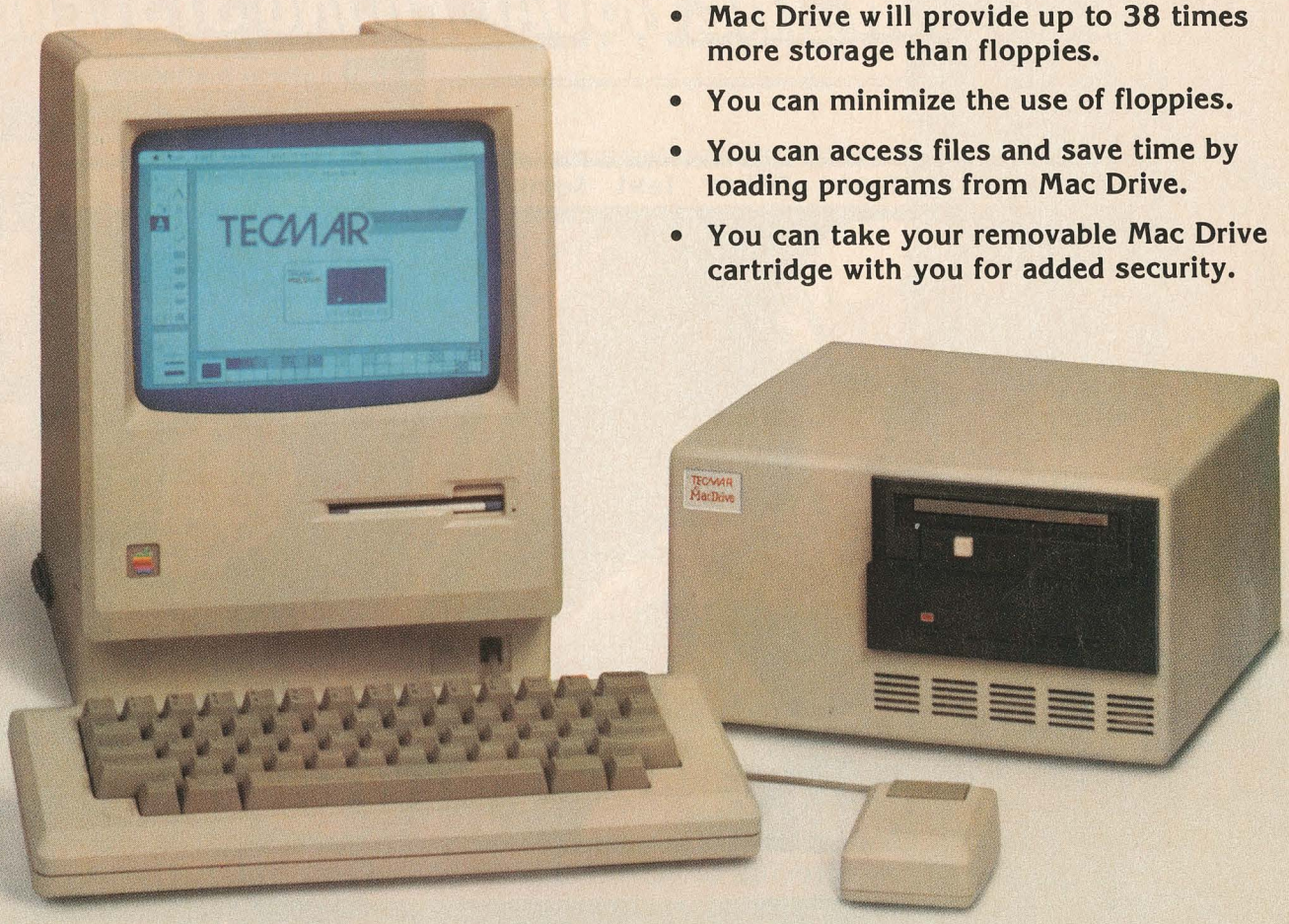

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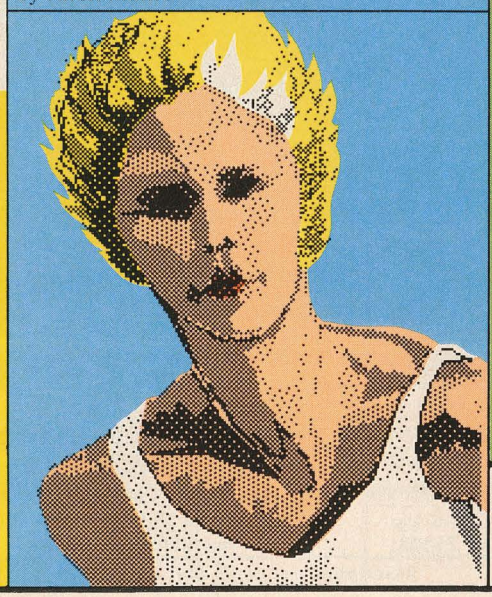

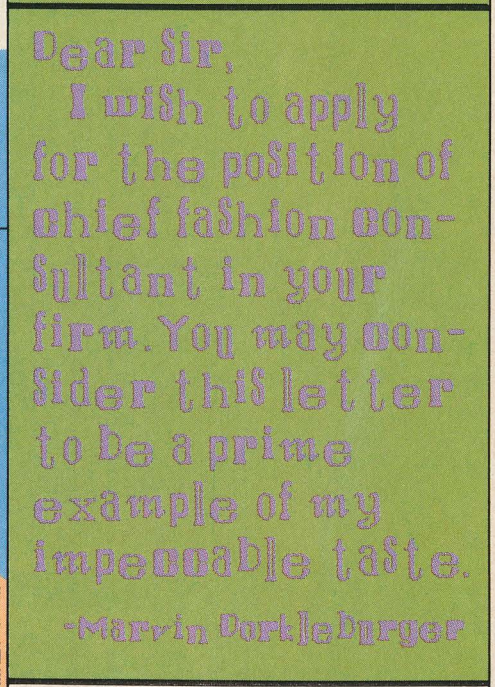

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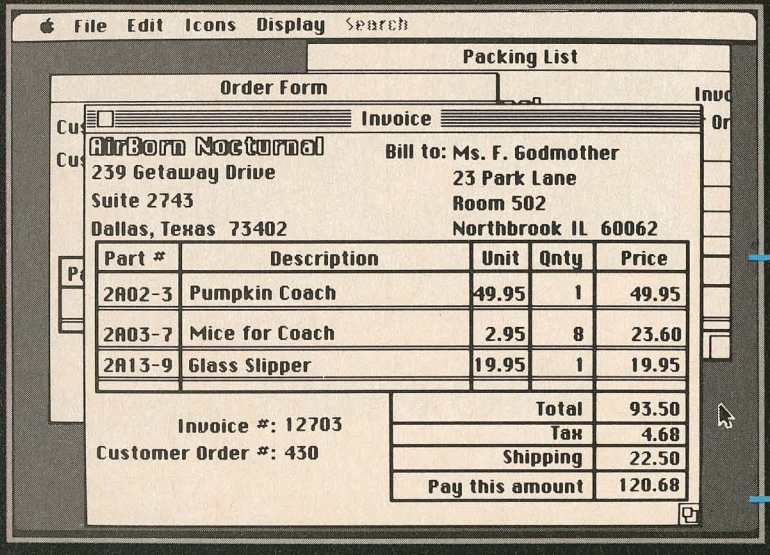

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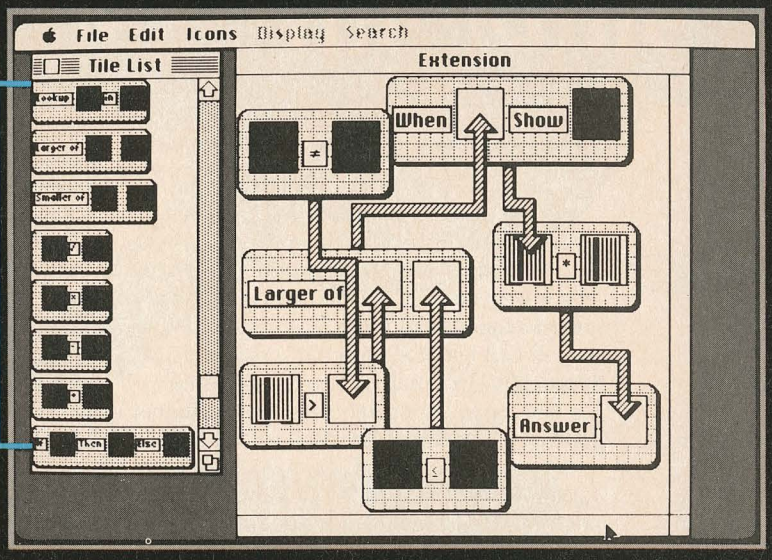

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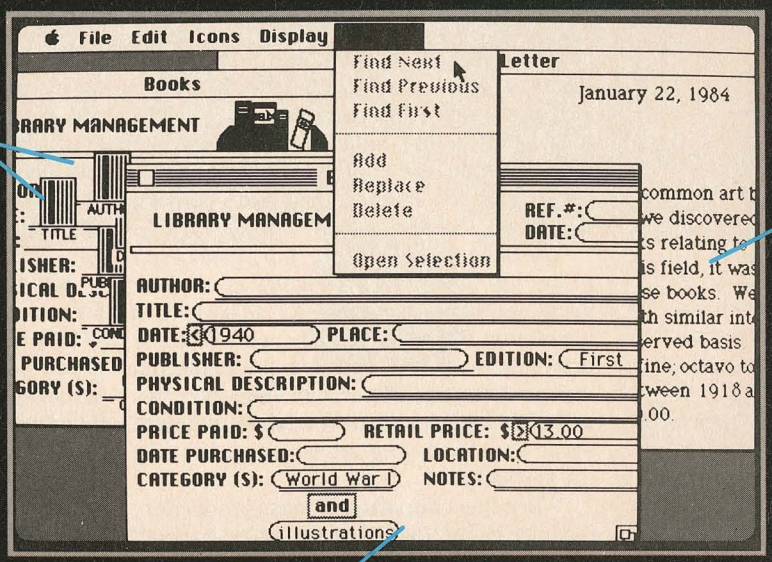

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VIEWPOINT

WHAT HAVE WE LOST?

To the old-fashioned hobbyist, the Macintosh is a sad declaration. It says that to break into the future we must break out of the past and leave it behind. The Mac breaks away from microcomputer traditions in a very profound way: It isn't really a "personal" computer anymore. It has become almost too powerful.

The Apple II represents a more traditional kind of microcomputer. Its specialty is generality—simplicity and open-endedness. It seems to say, "Here is the power of computing; you can use it any way you want to."

The Macintosh seems to be saying, "Here is the power of computing. Wait a moment and someone will come along to use it for you." With all its power and capabilities, the Mac cannot do anything useful until you put in an application program disk of some sort.

Traditionally, microcomputers have been designed as much for the hobbyist as for the professional computer user—but not Mac. The Macintosh has been optimized for the professional or business user; the hobbyist has been firmly shut out.

That's a major change in the very concept of the "personal computer," because the personal computer was created by hobbyists. Some years ago, a bunch of computer hackers took an integrated circuit that was designed for something else entirely and made a personal computer out of it; and that's where it all began.

The first microprocessor chip (an ancestor of the Z80 family) was designed as an intelligent terminal—a device for talking to a mainframe computer. It was supposed to be only an input/output device, but it could run its own programs in its own memory; this meant that the host system would not have to waste time managing the screen or reading the keyboard.

When this chip reached mass production, the price came down to where hobbyists could afford it. They discovered that you could add some memory, do input with a row of eight toggle switches and read output on eight LEDs, and have your own computer!

It was a complete bitch to work with, of course. You had to learn to think in machine language and do binary arithmetic in your head. But that's what made it fun: You could really get a sense of achievement from making those LEDs light up in a particular pattern.

The hobbyist market began to develop, and kits started coming out: a circuit board and all the chips and hardware you need to make a "single-board computer" (as they used to call them). This made it easier for hobbyists to get started, and the market grew. Then there was the TRS-80, using this chip in a complete, packaged system—and home computers hit the mass market.

It all started because a bunch of hobbyists took an existing design and started using it wrong. Hobbyists are meddlers. They like to take something apart and figure out how it works, then put it back together in a slightly different way. They think of it as "making improvements."

The Macintosh doesn't let you do that. You can't even take it apart, let alone modify it.

Oh, you can run different programs (applications) on it, and they can modify the machine in certain ways, but that's not at all the same. For one thing, you're not really modifying the system, you're just reconfiguring it: adjusting the controls that were built in by the manufacturer to be adjusted by various applications programs.

In an Apple II you can talk to the System Monitor—a built-in program that helps you write and debug programs in assembly language. The Monitor represents the "essential Apple": It's always there, managing things for whatever application is running. When there's no application running—when you just turn on the computer without putting a disk in it—the Monitor will talk to you and answer questions. It's not very bright, but it can tell you some useful things (if you're a hobbyist).

If the Macintosh has anything like the Apple's Monitor program that a hobbyist can communicate with and use to program the system—without putting in some third party's programming language disk—then the folks in Cupertino have hidden it well. The screen just gives you a blank stare if you turn on the machine without a disk in the drive. You never use the Mac as a Mac, only as a thing to run MacProgram on. There is no entity there, only a superb pipeline: The computer is nothing, the application is all.

And finally, the Mac is much too complex for one person to hold in his head at once. With a simple old machine like the Apple II, if you understand digital circuit logic and assembly language, you can see how the whole thing works, from electronic signals to high-level languages. It probably takes a whole *team* just to understand the Macintosh at that level.

These horseless carriages are all very well—fast, and convenient, and all that—but they don't have the personality of a horse. They're just machines. Sure, they represent the future, and I'll probably get one someday; but for now, I'll stick with my old horse and buggy. I understand how that works, all of it; and the horse and I can talk to each other.—Jock Root, Hollywood, CA

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Let Us Count the Saves

This is the very first time I have made money by subscribing to a magazine—your magazine. As a new Macintosh owner, I took advantage of your complimentary subscription offer. While reading Clicks & Pointers (June 1984), my attention was drawn to the suggested method for recovering a crashed disk (while the disk is booting, hold down the Option and Command keys). How on earth did David Durkee know that stashed in the back of my disk box was a crashed disk that I had been too embarrassed (and too cheap) to throw away. Several times I had thought of giving it a decent burial but something made me keep it—maybe as a reminder of the arbitrary *Twilight Zone* mentality of my machine. Anyway, I dug out the damaged disk, performed the suggested surgery, and the patient miraculously recovered. I now have a perfectly usable disk (worth $5), as well as a new sense of mastery over this little MacDevil.

Sandy Froman
San Bruno, CA

In the June Clicks & Pointers under the heading "Disk Recycling" David Durkee describes a method for reinitializing a "trashed" disk (I prefer "trashed" to "crashed"). The method he describes works well and gives you a wonderful opportunity to use the old "unbent paper clip in the hole next to the disk drive" trick (something we've all been dying to have a good reason to do). Here's another way to do it that will give you an opportunity to do something else you've always wanted to do.

Lay a refrigerator magnet on the plastic case of the disk and move it around for about ten seconds. I know that the first law of floppies says, "Thou shalt never, ever expose thy data to a magnet lest ye lose thy data," but in this case we want to lose data. Why? Because we want to fool the Finder into thinking the disk is blank so it will allow us to select the Initialize function. The Finder (as we know it) will only initialize a blank disk.

How does the Finder know the difference between a "blank" disk and a "trashed" disk? When a disk is placed in the internal drive the Finder tries to boot it. If it "finds" all the appropriate System information it will boot. If it finds most, but not all, of the System it will try to boot, fail, and give you an amusing (at least the first time you see it) visual of the "petard you were hoisted by," an apology (nice), a *serious* system error, your options (all those who end up with Restart, raise your hands), and an ID code number (this is to remind you that you're dealing with a real computer here and that there are dangerous individuals in this world who know exactly what ID = 3 means). If enough of the System data is missing that a boot cannot even be attempted, the Finder assumes it has a "blank" on its hands and asks if you want to initialize. The Finder does not check the entire disk surface for absolutely no data; hence, the magnet ploy works because it wipes out enough data that the Finder thinks it has a blank. Here's the disclaimer you've been waiting for: "Never, ever get a magnet even close to a good disk!"

Kenneth W. Jenkins
Bowling Green, OH

Your publication always seems lighthearted, as if those who put out *ST.Mac* really have fun doing it. The June issue is the best I've seen so far.

The reviews (or previews) of new programs are quite welcome. My only problem is where I'll get the money necessary to purchase all the software that comes out for the Mac. You see, I'm the guy who wrote to *InfoWorld* just after the Mac was released and told the world what a junky machine it was going to be. Then I really had a chance to sit down and play with it and I did what aviators call a "180°," promising then and there to buy not only a Mac but all the hardware or software that comes out for it—whether I need it or not!

With both hardware and software so hard to find for this marvelous machine, your ads keep one abreast of what's currently available as well. So, in the case of *ST.Mac*, the ads are just another feature, rather than a distraction.

Regarding Clicks & Pointers in the June issue: I too have run into the same problem that David Durkee came across—a disk that will not boot or be accepted by the system and thus cannot be reinitialized (or formatted) for reuse. I have a couple of methods that require less disk swapping than Durkee mentions.

Durkee suggests booting up off a good disk, then ejecting it with the menu command Eject, replacing it with a second, good disk, manually ejecting *it* with the "paper clip in the hole" trick, and finally inserting the bad disk. The Mac will be unaware that the bad disk is now in the unit and one can call upon the menu to Erase Disk.

Instead, try this method. Boot up on a good disk and eject it in the same manner that Durkee suggests. Then, insert an uninitialized disk.

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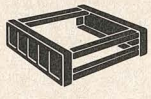

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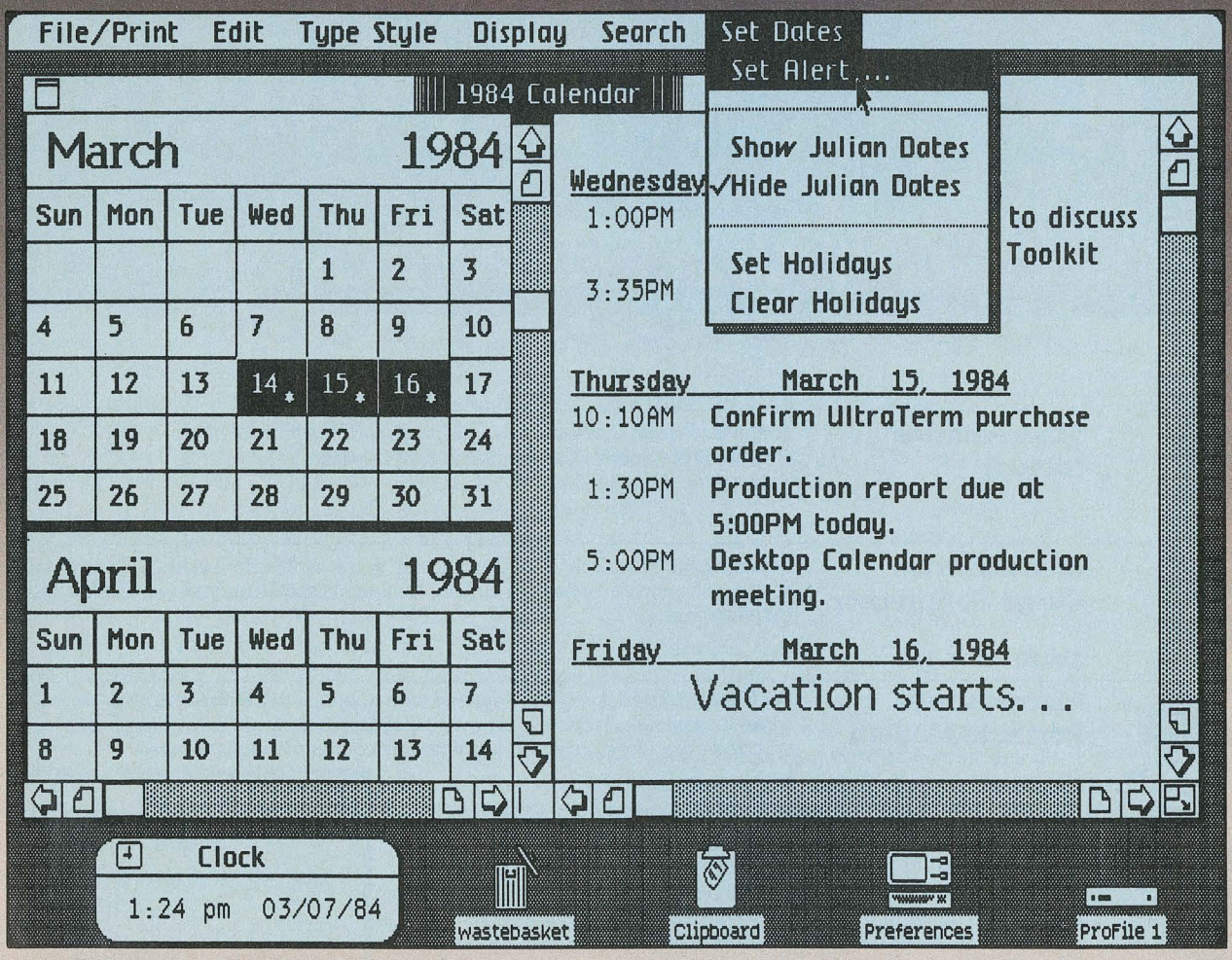

Desktop Calendar for your Lisa 2

Desktop Calendar, a new tool for the Lisa 2, will improve the way you work because it helps you manage your time.

Your're an important person. Working hard to get the job done. But what happens if you get so involved in your work that you lose track of time? Missing an important appointment or meeting can mean disaster.

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Talking on the phone to an important client? Want to know all the dealings you've had with them for the last three months? Desktop Calendar will search through its electronic notebook and tell you. Want to know the address of an important business contact named 'JONES'? Desktop Calendar will tell you that too.

Desktop Calendar is more than just a calendar for your computer. It will also keep track of appointments, hold addresses for easy reference and remind you of important events, even when you are busy working with another tool in the Lisa Office System.

Desktop Calendar will be available third quarter 1984 from Videx.

Videx Inc.
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The Mac will try reading it, see it has not yet been initialized, and place an alert box on the screen asking for either the Eject or Initialize command. Now, at this point, use the paper clip method to remove the blank disk and then insert the bad one. Then click on the Initialize box and watch the Mac wipe the old disk clean.

There is a second method that works just as well and requires only the startup disk to be loaded and ejected. This will cut out yet another swap. Get in a room away from any of your magnetic media (computer disks, mag cards and tape, audio tapes and cassettes, videotapes) and bring the bad disk with you. Then use a quality videotape eraser to bulk-erase the disk. Now boot up on a good one and place the bad disk in the Mac. The formerly bad disk is now as clean and blank as when it left the factory. The danger here is that one must know the proper method for bulk-erasing, or high-residue magnetism can be left on the media being erased.

Craig A. Pearce
Berwyn, IL

Not Seduced

I read with some chagrin the article, "The Seduction of the Independent Developer," in the June issue. From the tone of the article, Apple is eager to lavish support on any serious software developer. My experience has been otherwise.

I am a professional software developer with a small reputation within the industry. I decided to make the commitment to Mac on March 22 of this year. I sent an inquiry letter to Apple and received an application for the Certified Developer Program in early April. I sent in the completed application the next day. I was certified on May 8 and sent in my order for a Lisa development system and Mac on May 29. As yet, I have not received the Lisa development system. Almost all the delay is attributable to Apple, not me.

If all this support were free, I would take the attitude that you get what you pay for and shrug it off. But no! I have paid Apple good prices, cash in advance, for the privilege of this "service." Their prices to software developers are very close to their wholesale prices. They are not subsidizing anyone. I do not complain that their prices should be lower—my objection is to being treated like a charity case when Apple has gotten nearly $10,000 of my money in advance.

I hasten to include the positive side of my experience. I remain wildly enthusiastic about the Macintosh and the overall system support for it. The technical documentation is superb, and the development software described in the documentation seems to be excellent. Apple has made an ambitious effort to support software developers—certainly more ambitious than the one I ran at Atari during 1981. All of the Apple people with whom I have talked have been friendly and courteous.

Unfortunately, it is obvious that they have been completely swamped by the load of support demanded of them, and their effective level of support is very low. Guy Kawasaki may talk of the "aggressive seduction of the independent developer," but the real situation is closer to what Mae West might have encountered on a desert island with 2,500 men. Standing on the fringe of the crowd, I don't feel very seduced.

Chris Crawford
San Jose, CA

Cry of the Hacker

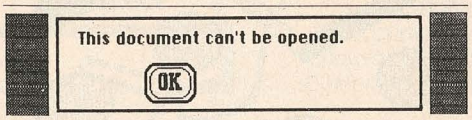
Am I p.o.'ed! I bought my Mac in support of the underdog and because I feel the 68000 defines a new state of the art. I'm writing in hopes of rallying support among Mac owners and publishers to coerce a responsible manufacturer policy concerning product support. Calls to the Apple technical assistance people in the Boston area have left me completely exasperated.

I am an electrical engineer by profession and an adept home computer hacker by hobby. My desire to tie into the operating system to play with and develop such capabilities as the sound port (much ado about *nothing*, so far) or to interface hardware via the acclaimed "virtual slot I/O port" ("virtually inaccessible" would be more apt) have all been frustrated by the following line: "Are you a Certified Developer?" I feel like I'm being treated as a child.

When will my Mac really be mine? I could understand paying $25 to $50 for technical manuals, but paying $150 for photocopies of a manuscript form of documentation after having already invested $3,000 simply smacks of rip-off! My professional need and personal desire to learn about this machine are being totally stifled. Of course, I could always buy a Lisa, *Inside Macintosh*, and the Macintosh Software Supplement; incorporate; hire business managers, marketers, and engineers; establish an "existing" product line; pay Apple the $500 Macintosh Registered Developer Program fee plus another $500 for the Mac-College sessions; and God knows what else. But I'm just a lowly end user in the eye of my Apple.

Whatever became of Apple's famous "open information" policy associated with the Apple I and II series—you know, "the more innovators the better" sort of thing? I consider myself to be an independent developer (I'm even registered as one) and found myself absolutely MacSick of reading about how eager Apple is to help. Maybe I should just trade in my Mac for the Big Blue; at least you know where you stand with them!

Matt Johnson
Walpole, MA

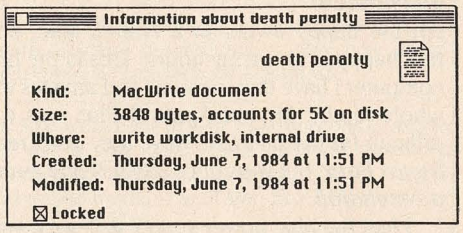


Can This File Be Saved?

This is a frightening dialog box. Very frightening and very frustrating. Particularly if it's one o'clock in the morning, you're a fourteen-year-old high school freshman, and the document that can't be opened is due to be turned in fourth-period this morning.

That's exactly how it was when my daughter woke me to see if I could help her recoup the paper Mac had stolen. She had worked hours writing it to disk just before midnight and had called this document back for final editing and printing. Editing complete, she clicked on File, dragged to Save, and released the mouse button. Mac crashed, as the screen flickered, crackled, and degenerated into a tight, squiggly lined pattern. We've grown used to this type of crash; we've been getting it several times a week. The correction is to shut Mac off (knowing we'll lose internal memory), then simply reboot and start from where we'd last saved to disk.

This time it didn't work! Every other document (about ten in number) on the disk could be opened, but not this one. The icon still appears in the Finder. We can call up information about it. We can even duplicate it and copy it to another disk. *But we can't open it!* I'm enclosing a copy of the screen printout showing the offensive dialog box and the



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information window on the lost document. Can anyone please offer suggestions, ideas, and/or hard and cold facts as to what happened—and how it can be opened (or made openable again).

P.S. Oh, yes. My daughter spent the next couple hours rewriting her entire paper and turned it in on time. A real Macintosh trouper, that one.

George E. Dawson
Whittier, CA

A crash like the one you described happening several times a week sounds like a good juicy hardware problem. Take your Mac back to the dealer. Dealers usually repair these problems by swapping out the main circuit board.

Flashtrash

During the execution of a flashcard type of program that I wrote using Microsoft Basic, the apple icon on the Mac's Finder menu began to blink, and after I had entered a few more lines, an "out of memory" message flashed on the screen and I was unable to continue.

The flashcard program was one of many files on that particular disk (which also included the MS-Basic application program), but there was still about 173K of memory left on the disk. Nevertheless, I copied the entire disk to a blank disk, trashed everything on the new disk except the MS-Basic application and the flashcard program, ejected the disk, and turned off the computer. I turned the computer back on and loaded the new disk containing only the MS-Basic application program and the flashcard program. The apple icon started blinking again. I was able to add another two program lines before I was "out of memory" again. The last line number I was able to complete was line 5130 or so. (I started the program with line 10 and numbered the succeeding lines by ten.)

Curious, I ejected the new disk and loaded a *MacWrite* disk that contained several files. As had happened when loading the two previous disks, upon the appearance on-screen of the disk icon, the beeper sounded and the apple icon started blinking.

So, I opened a *MacWrite* file to compose this letter and will now see if it can be saved and/or printed.

(Success!)

What do you think? Is the problem with the computer or the Basic? Remember, the apple icon flashes even with the *MacWrite* disk loaded. The flashcard program is the only one I have ever written. It's a primitive affair, consisting mostly of PRINT and INPUT statements. Can anyone help?

Bertha Alexander
Washington, DC

The apple icon flashing means that your alarm clock has gone off. To stop it, open the alarm clock, turn off the alarm, and close it again. "Out of memory" refers to computer memory, not free disk space. The Advanced Notes program on the Basic disk tells you how to free up more memory for program use.

Macnifique!

I'm the happy owner of a French Mac, and he's happy to share my hours. This is the first computer I have that interests and amazes the whole family. My old Apple II Plus was too difficult for them to use. Now, they don't read *Syntax Error*, but *Vous avez commis une erreur a cet endroit*.

I feel the Mac power supply gets very, very hot after half an hour. All my Macfriends have the same problem, but perhaps it is particular to French Macs. Another problem is the dependence on the user. You have too many operations to do when you're changing the disk or working with more than one disk on the desktop.

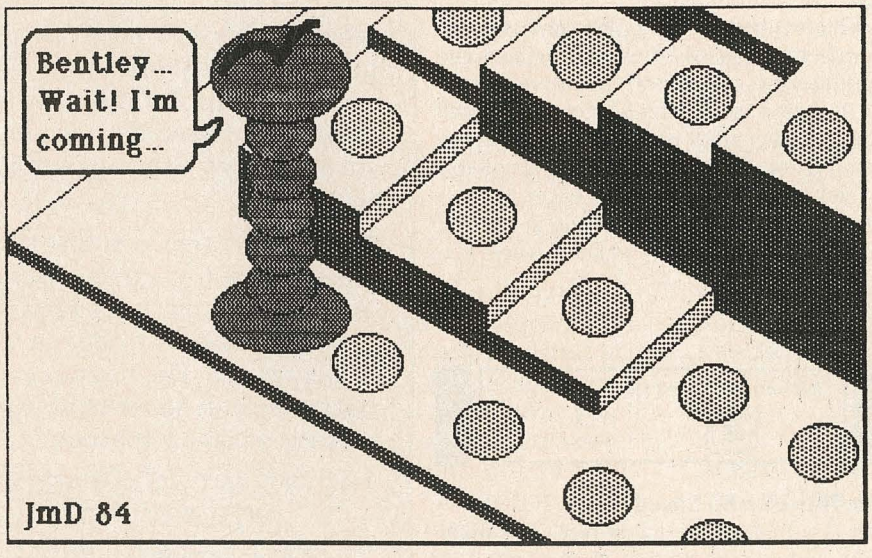
But in general, this is the best computer I've ever seen for the price (we're not talking of the $90,000 Symbolics Lisp machine).

Now, it's my turn to send you a little picture made with *MacPaint*. You will recognize a famous arcade game I'd like to see developed on the Macintosh. I play regularly in the arcades because I just love high scores. For this one, I end with 753,000 points, but the French high score is approximately 844,000 points. (My father's coming! Let's speak of more serious things.)

Apple France has just created the Club Apple, of which I'm the proud 504th member. They have also created the Apple Expo, which is a great show in Paris during three days, with Apples only (no PCs).

Well, I talked too much, but I wanted you to know you have readers in Paris, and that the Macintosh is continuing its worldwide crusade against PC the Heretic.

Jean-Michel Decombe
Vaucresson, France



Shalom!

My name is Yariv Nachshon and I am a member of the first Macintosh members club in Israel. In Maclub we have ten members, and we want more from all over the world. Please try to connect us with other Mac users. Thank you very much.

Yariv Nachshon
13 Nehardeaa Street
Tel-Aviv, Israel
Zip: 64235
Telephone 03-231925

Who's Doozy?

I would like to give you a secret I found in *MacPaint*. Try Command-shift-1, all at the same time. Also, I'd like to know if everyone got a doozy *MacWrite/Paint* disk, or am I the only one?

Greg Bibas
Austin, TX

Command-shift-1 is a system command to eject the internal disk. Command-shift-2 ejects the external disk. It should work the same way from all programs. Now can anyone tell us what doozy *means?*

Signal Crossing

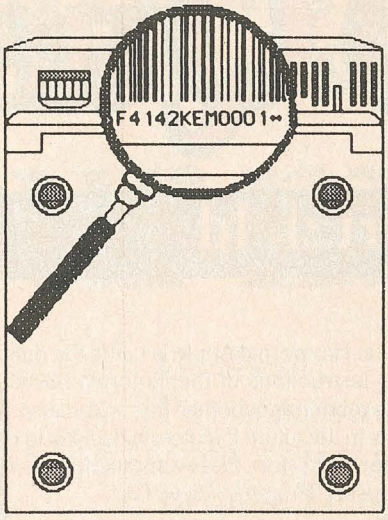
Thanks for plugging *Semaphore Signal* in the Sisters of Christian Charity story in your June issue, which described our publication as "for the Lisa." Although that certainly was true way back when *Signal* began in June 1983, last February our coverage was expanded to include Macintosh news and information. Subscriptions are free to any Lisa or Mac user sending us their machine's serial number.

Mike Gabrielson, Editor, *Semaphore Signal*
Aptos, CA

M-I-C, K-E-Y...

I have discovered, unfortunately, the Mac's Achilles' heel. While in *MacPaint* my mouse's horizontal movement sensor failed. I could only move up and down with the pointer. I searched frantically for a command key equivalent to save and close my file, but alas there

What Fun Would That Be?
Enclosed is a copy of my Macintosh serial number; please enter my free subscription. Finding the serial number took several tries. I kept trying to find it on the FCC label on the back. Apple has done a good job of hiding it. You might mention in your magazine where it is hidden to help future owners. You might also offer some advice on how best to tilt back the Mac without damaging the connectors for the mouse or printer.
Greg Loe
Sacramento, CA



Okay. Tilt the computer to the side (the right side if you have the programmer's switch installed) and read the number under the lip of the front panel, right next to the brightness control.

is none. I had to power down and up again in order to eject my disk. I then inserted a *MacWrite* disk that I didn't care about, to see what I could do with the Command, Option, and shift keys in assorted and sundry combinations.

To my horror, there is nothing documented or hidden that will let you so much as open the loaded disk, let alone an application or another file. If the mouse goes you can't use the Macintosh for anything but a paperweight or night light. I'm writing with the hope that someone out there may have a kludge solution with a joystick or something that can be used as an emergency mouse.
Steve Lee
Cleveland, NY

Floating Lisa Faster
Your article entitled "All This and Lisa 2" in the February issue was very informative. On page 46 of that issue it was stated that "Lisa supports an add-on math coprocessor (AMD9512) for faster floating-point calculations." This is of considerable interest to me because I am planning to buy a Lisa and would like to add such a capability. In my field of engineering—energy analysis—many of the problems to be solved require significant calculation time.

Unfortunately, I have not been able to find out where to obtain the referenced coprocessor. Queries to Apple dealers and technical personnel have to date drawn blanks. Could you please provide such information?
Richard Searle
Simi Valley, CA

You can't get the coprocessor because the socket for it was deleted from the Lisa 2. The socket did appear on the original Lisa. At the time the article was written, Apple was considering the coprocessor enhancement but apparently later decided that the new Lisa 2 math codes worked fast enough.

Correction and Glaring Oversight: Contrary to what was reported in "The Seduction of the Independent Developer" (June 1984), the Software Supplement can be purchased from Apple Computer, 467 Saratoga Avenue, Suite 621, San Jose, CA 95129.

Also, in July's Clicks & Pointers we forgot to give credit to Broderbund Software for the inspiration behind creating a computerized greeting card. Thanks, Broderbunders; now how about designing a *Print Shop* for Macintosh?

ST.Mac would like to hear your reactions to articles as well as your views about the world of personal computing. Send your opinions, queries, suggestions, and solutions to ST.Mac, Box 7041, North Hollywood, CA 91605.

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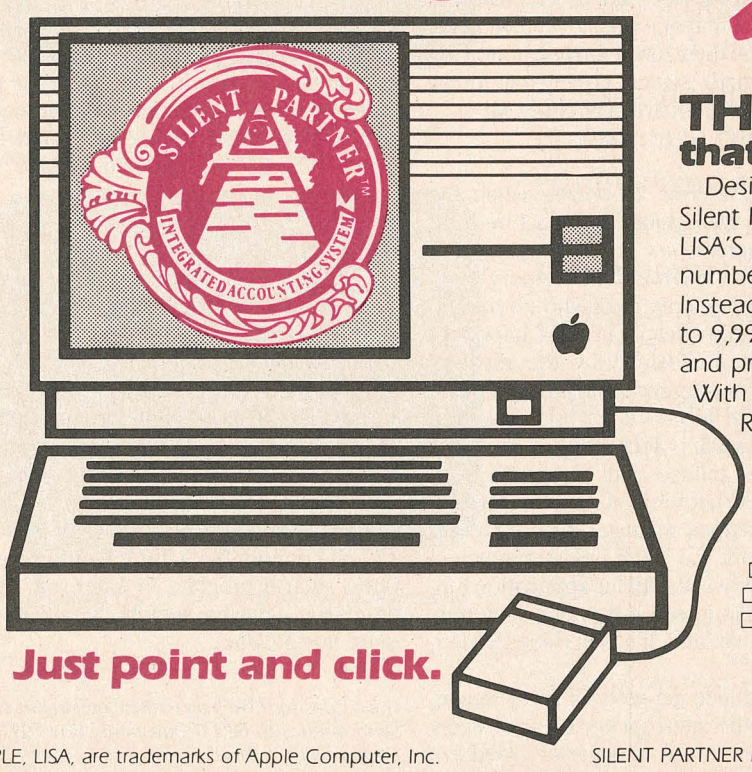

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68000 Questions

By Andy Hertzfeld

Q: I have *MacWrite* on a startup disk that has now started giving me the message "Serious System Error...ID = 10" upon booting. Curiously, if another disk is used as the startup disk and then the problem disk is inserted, the same error message with "ID = 2" appears. My questions are: Why is there a difference in error messages for the same disk, and how can I recover files on the damaged disk?—Warren Michelson, Page, AZ

A: The Finder maintains an "invisible" file called DeskTop, which keeps track of the names and positions of folders and other information about the current state of the desktop. It is possible for this file to get damaged in a variety of ways, causing system errors when the Finder opens the file. Fortunately, there is a way to boot a disk with a damaged DeskTop file: Simply hold down the Command and Option keys while booting. This instructs the Finder not to even try to open the DeskTop file; instead it rebuilds a new one by scanning the disk's directory. All folder information will be lost, but otherwise the disk will be fine.

You received different error messages for the same disk because the Finder accessed the DeskTop file in different ways within the two different contexts. System Error 2 is an address error (a word or long reference was made on an odd address), while System Error 10 is a line 1111 trap error, which probably means that the disk failed one of the Finder's built-in consistency checks.

If this doesn't work, your disk is not a total loss. The Macintosh file system maintains tags on every block of data to ensure that most files on a disk can be recovered even when the directory is lost. Apple (or some other enterprising party) will eventually make a "scavenger" program available capable of repairing even severely damaged disks.

Q: I've heard that when Microsoft wrote the operating system for the IBM PC they used one of the undefined instructions contained in the 8088 microprocessor, and that when Intel introduced an updated version of the processor to take advantage of the previously undefined instruction, it caused problems with MS-DOS because they weren't supposed to be using that instruction in the first place. I know that Apple is using the line 1010 trap instructions of the Motorola 68000, and I'm wondering whether this will cause problems in the future if Motorola decides to define a function for these instructions.—David Simpson, Mountain View, CA

A: When Motorola designed the 68000 they left an eighth of the instruction set undecoded for possible future expansion. Apple has worked closely with Tom Gunther's group at Motorola during the design of Lisa and Macintosh, and they thought it was okay for us to use the line 1010 traps. It's silly to waste such a compact way of making system calls. Motorola will certainly factor Macintosh into their future plans, since it already has the largest installed base of any 68000 computer. As far as I know, the 68020 (the next generation of the 68000, a true thirty-two-bit processor) also leaves the line 1010 instructions undecoded.

Q: In the May 1984 issue of *ST.Mac*, there was a discussion of System Error IDs. Well, I just experienced an ID 28 error and wondered what that one was. It occurred after I repeatedly pushed the interrupt button on the programmer's switch connected to my Macintosh.—Ian Richard Day, Niles, MI

A: System Error 28 occurs when the stack (a large, important data structure used for passing parameters and allocating variables; it grows downward in memory) gets low enough in memory to crash into the top of the application heap (another important data structure maintained by the memory manager; it grows upward in memory). Since it is impractical to check for this condition each time the stack is accessed, we check for it every sixteen milliseconds during the handling of the periodic vertical retrace interrupt. The vertical retrace manager keeps track of the lowest point the stack has ever reached (this information is useful for application tuning) and checks to see if it is currently trespassing into heapland. If it is, it issues System Error 28.

You were able to get an error 28 by repeatedly pressing the interrupt key because every time the system error manager is invoked it allocates some local space on the stack. If you interrupt it enough, it will eventually run out of space and crash into the heap.

Q: Is there any way I can paste a whole *MacPaint* document into a *MacWrite* document instead of pasting only that portion that can be viewed in the *MacPaint* window? It sure would be nice!—Jon Christie, Los Angeles, CA

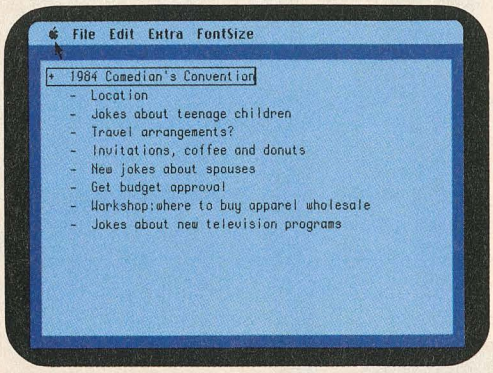
A: Right now, I know of no way to do this, although Ken Krugler at Apple has been threatening to write a desk accessory capable of doing this. In fact, including an entire *MacPaint* document at once would be impractical for a few different reasons: It would take a lot of memory (*MacPaint* documents are disk-based, while *MacWrite* documents are RAM-based), and *MacWrite* doesn't allow a picture to span a page boundary; you'd be better off just printing your page through *Paint*. It would be nice to be able to cut a little wider than *MacPaint* currently allows.

Q: One not-so-fun thing about using a single-drive Macintosh is copying a disk. Since many Mac owners may be unable to afford a second drive but may have access to a second Mac (such as at school or work), it would be nice to be able to hook two Macs together to duplicate a disk. Is it possible to connect two Macs through the serial ports and run a disk copy program? If it has been done and some software is required, what are the chances of its becoming public domain and being distributed to dealers and developers?—Steve Shendelman, North Hollywood, CA

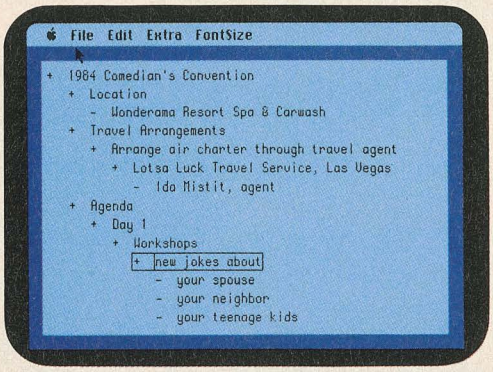
A: Apple's *MacTerminal* program is capable of transferring files between two machines through their serial ports, but it only sends/receives a single file at a time (and it is not public domain, even though it sort of seems to be). The DiskUtil utility program available to developers can receive files through the serial port while the SendFile program can send them, but they are intended for programmers and are a little dangerous for naive users to feel comfortable with. It would be easy to write such a program in Microsoft Basic or MacBasic—maybe somebody will and then send it to *ST.Mac*.

Got a question? We'll try to answer it in this column. Send queries to 68000 Questions, Box 7041, North Hollywood, CA 91605.

Give Mac a piece of your mind.



Inspiration is fleeting, so just let your thoughts flow. The flexible format makes it easy to rearrange them later into headings and a basic outline.



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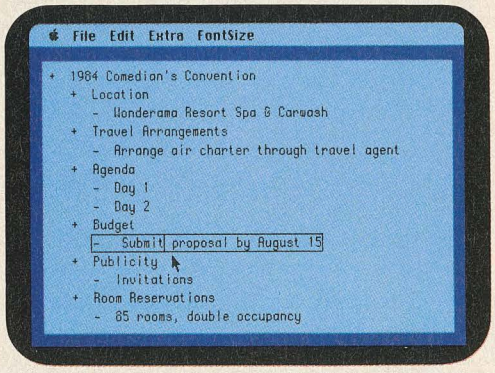

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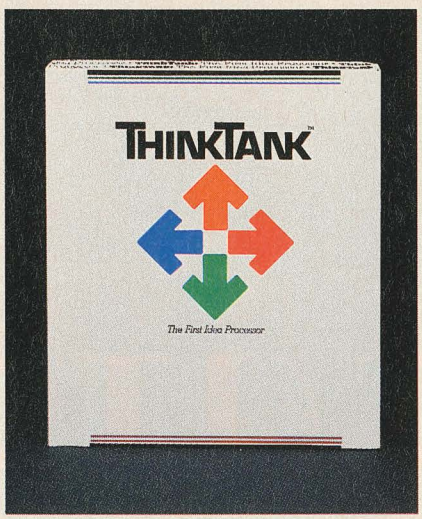

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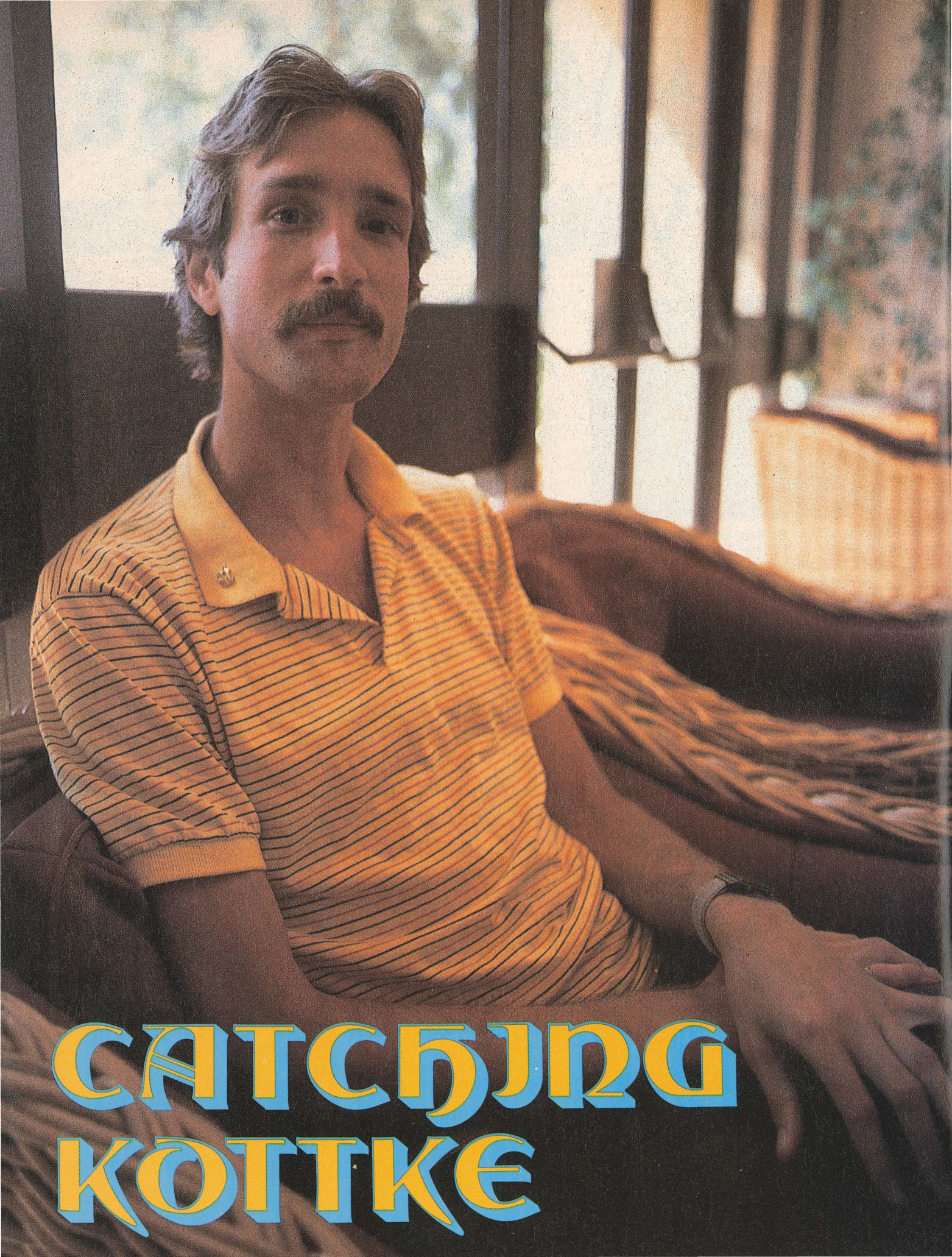

CATCHING KOTTKE

The Straight Stuff from One of Apple's 'Grand Old Men'

by DOUG CLAPP

Who to interview? Burrell Smith was out; he was too busy designing "secret projects" and recovering from "media overload." Donn Denman was out, for now, because he hadn't finished MacBasic when this interview was scheduled (maybe next time).

And Steve Jobs hardly talks to anybody, and Apple president John Sculley, even if available, probably wouldn't divulge any juicy tidbits, so....

Who to interview? After long minutes of furious thought, the name Dan Kottke leapt to mind. Dan is a hardware engineer on the Macintosh project, is one of the original Apple employees, knows lots of interesting Apple stuff, is quick with an opinion, is neither blindly "Apple Forever" or "Everything's Junk," and is just generally a fun guy to hang around with.

With that in mind, writer Doug Clapp and *ST.Mac* editor Pat Ryall went to Cupertino for two marathon sessions with Daniel Kottke. The subjects ranged wildly, from Apple's unreleased networking system (called AppleBus, which allows computers to be tied together and communicate directly) to the magical SCC communications chip in the Macintosh to "early Apple," Alan Kay, laser printers, pricing, marketing, hard disks, color Macintoshes, and more.

What follows is not the official word from Apple, but we think you'll find it interesting nonetheless. We did. And we found that, just as we suspected, Dan *is* a fun guy to hang around with.

Kottke: I don't know if you've got any good ideas for an angle on this interview. Because I'm not involved in any hot projects right now, and even if I were I couldn't tell you about them. But you know that AppleBus and the laser printer are the big upcoming products, and I really shouldn't say much more than that.

DC: That's okay. AppleBus is boring anyway.

Kottke: AppleBus is not boring; it's really exciting!

DC: Really?

Kottke: I think it's one of the neatest things we've ever done.

DC: Well, it doesn't really affect the typical home user or the hobbyist.

Kottke: Potentially it does affect the home user with regard to getting extended use out of Mac's serial ports. But beyond that it's exciting in terms of the marketplace. It's like a whole new level—it gives a whole new dimension to the machine [Macintosh].

DC: And it's a great attack on IBM.

Kottke: We're not doing it just to attack anyone. We're doing it because we're able to do it. In a sense, we're doing it because we've got this great chip called the SCC that makes it possible, in the same way that the 68000 makes the Macintosh possible.

DC: Let's talk about the SCC chip. Is the Macintosh the first computer it's been used in?

Kottke: I don't know, but it's a very new chip, and Burrell [Smith, Mac's hardware architect] found it—I don't know who tipped him off to it. Zilog makes it. It hasn't been out very long.

DC: Tell us about "bandwidth." Because there's been a lot of talk about the speed of the SCC chip, saying that it's fast enough to handle both voice and data at the same time.

Kottke: I've never heard anyone say that; in fact, I don't think it necessarily makes sense. Let's just look at the rough numbers. What are the bandwidths of audio or analog signals? On the low end, you have telephone-grade audio, considered to have a 3-kilohertz analog bandwidth—by bandwidth here I mean highest frequency component. If you digitize that, which is what voice-mail companies do, you get a bit stream with a baud rate or digital bandwidth consisting of the wordsize times the sampling rate. Recognizable speech can be as slow as eight bits times 6 kilohertz, making 48 or 50 kilohertz. Mac audio is eight bits times 22.7 kilohertz, or about 180 kilohertz—almost four times better. Digital Audio Disks run at about sixteen bits times 50 kilohertz, which comes to 800 kilohertz, or four to five times better still. The Mac Sony disk transfers six bits every sixteen microseconds, which gives you about 375 kilohertz, which is twice as fast as Apple's Disk II.

But what does all this mean? Well, was our comparison against the SCC chip itself or AppleBus? Let's look at both. The SCC chip will run flat-out at 1 megahertz, almost as fast as the Mac's bus cycle. Software can't keep up for long with data at that rate. I heard that the Tecmar hard disk for Macintosh runs at about 700 kilohertz. AppleBus runs at 230 kilohertz. Since we said that Mac sound runs at 180 kilohertz, that means, theoretically, you could send a continuous sound channel over AppleBus with room left over for data—and no useful time left over for the processor!

Anyway, the thing that's particularly great about the SCC is that it allows "header recognition." Header recognition means—I'm trying to think of a good analogy. It's like a receptionist at a desk screening your calls.

DC: What's a "header"?

Kottke: When you do any kind of local area network the basic data structure is the "packet." As in "packet-switched network," a common phrase.

DC: Right.

Kottke: And every data packet has a header. A packet is basically like a sector of data on a disk. Sectors are usually either 256 bytes or 512 bytes, and it makes sense to have uniform sector size on a disk to efficiently fill the space. On AppleBus, packet size will be variable but no greater than 600 bytes and at least 3 bytes.

DC: And that's the "header"? So the smallest packet is just a header?

Kottke: Right. And what the header tells you is "where it's coming from," "where it's going to," and "how long it is." Okay? And, when you've got a network, there're millions of bits flying by, all the time. You can't go interrupting your processor for every single message. So you really need what's called "header recognition." And, generally speaking, that's done by an entire circuit board. But all that's built into the SCC chip. The SCC chip is always looking at the data line; it's always taking in data. Every time it sees data, it takes in the first couple bytes and compares them with a register it has, which has its own address. And if the address doesn't match, it says, "Oh, well, not for me."

DC: So the SCC's like a processor? It's got registers....

Kottke: It's got registers, and it's very complex. It's not really like a processor; it's a *communications controller*. It doesn't have the same architecture a processor does, by any means, but it has "smarts." So anyway, we have this chip, and it's always looking at the AppleBus. The only time it interrupts your Macintosh is when it finds a packet that's addressed to you. Having a secretary answering your phone is a good analogy. It's as though people are calling your number all the time, but a lot of the calls are not necessarily going to be for you personally. But anyway, back to the subject: Have we got any interesting things we can talk about?

PR: I want to hear about laser printers!

Kottke: Well, quite honestly, I don't know much about the laser printe

Photo by Kurt Wahlner

"I remember seeing the first color Apple logo and thinking, *This is significant*. And I just knew the company was on good footing."

project we're doing. We've got one guy doing it, and he's doing it in a closed room, and it's locked, and the guy doesn't talk, so I don't know much.

PR: It was more of a personal question anyway.

Kottke: Well, I can tell you what I think they're good for without having any specific references to our products. Laser printers will enable people to do a lot of work themselves without requiring a typesetter.

PR: I'd love to see typesetting made obsolete.

Kottke: Typesetters are very concerned!

PR: I do *a lot* of typesetting at work. (*laughter*)

Kottke: Typesetters are going to go out of business!

PR: We could all go into designing fonts. None of the Macintosh fonts are anything we could use for body text in the magazine. Somebody needs to get everything that's on a typesetting system onto a computer.

Kottke: The main thing is that the laser printer does for typesetting what the computer did for writing text. On your desk, you can compose with your Macintosh or Lisa or whatever, and you can print out things that are acceptable camera-ready artwork.

DC: How fast?

Kottke: Acceptably fast. I think almost anything is acceptably fast. Speed was never that much of an issue. It's like—if you're printing out 100 copies of a letter, you should get a Xerox machine! But that's the whole thing. A laser printer is a Xerox machine. *It is!* It's a Xerox machine that's independently addressable with a laser. So you can use it strictly as a Xerox machine, or you can dump down into it from your computer.

PR: Well, we have an understanding at work: We can't get a laser printer until they're less than $4,000.

Kottke: We hope to do that by the end of the year. Seriously. You know, that's what Steve Jobs is really good at: visionary product direction. And he's really right on. He's the one who's pushing for laser printers. But the people that make the printer mechanisms deserve most of the credit. Those things are really hairy. It's hard to get those things to work. And we're taking the mechanism, and attaching a computer to it, and making a package out of it. It's the same way that Sony should get credit for the 3 1/2-inch drive. We didn't make that drive, and we would *not* have done it. We tried making 5 1/4-inch drives and it didn't turn out to be a smashing success.

DC: True enough.

Kottke: In fact, I would say that the "twiggy" drive [used in Lisa before being discontinued by Apple] was not a bad thing. The Apple III's not a bad thing. But the technology moves so fast. If you're doing kind of an "evolutionary" product, you fall behind. You have to take leaps. And the twiggy was basically a reengineering of products that had already existed. It was great, five years ago, when it started, but the whole project just dragged on.

DC: Five years?

Kottke: Yeah, and Apple's main product stream is not making disk drives. But we're making our own hard disk drive that we're shipping in the Lisa, and, from everything I've heard, that drive is just great. We designed and built it from the ground up, so ultimately it should be cheaper than anything else we can buy.

PR: That's the ten-megabyte drive?

Kottke: Yeah, and it's working really well. It's not in high volume yet. We're shipping it in the Lisa 2/10, and I think at some point we may introduce it for the Macintosh. I hope that works out because, eventually, all our computers are going to want hard disk drives, or a very large percentage of them. The technology is clearly here to stay. I don't see any huge magical breakthroughs coming along the line to replace that technology.

DC: How did you get involved with Apple?

Kottke: I was always interested in electronics. But the funny thing was, for the first couple of years that I knew Steve [Jobs], I didn't know that he was interested in electronics. Steve was my friend on kind of a literary-philosophical level. He was the friend of a dormmate and had these Bob Dylan tapes playing one day, so I just sat down and listened. At the time, I never even knew he was involved with "blue-boxing" [illegally making long-distance phone calls with the aid of hardware cleverness]. That was a secret, I guess.

DC: You were in college when Apple first started?

Kottke: I was a junior at Columbia in New York City when Steve started Apple. And I just came out for a summer job.

DC: Who was here when you came out?

Kottke: At Apple? Nobody!

DC: You mean it was just Steve and his sister?

Kottke: Literally. When I came, Steve's sister was plugging chips onto the Apple I logic board, and not doing a tremendously great job. So I started doing that: I assembled Apple I logic boards, and I tested them.

DC: You got paid?

Kottke: Oh yeah, I got three dollars an hour!

PR: What year was that?

Kottke: 1976.

DC: This was when Steve Wozniak was at Hewlett-Packard?

Kottke: I didn't know Woz for quite a while. Woz was never around the garage. He'd come by every week or two, but he never hung out there a lot. I think Woz was intensely busy at that time. The Apple I had already been designed—that was when he was working on the Apple II, though I didn't know it at the time. He was staying up late nights, prototyping the Apple II, writing code for it, writing Integer Basic, writing the Monitor routines.... That's why I never saw him.

DC: This is after Paul Terrell's ordering the Apple I's for his Byte Shop?

Kottke: Not long after.

DC: The first order was how many in a month?

Kottke: I'm not sure. I think $30,000 worth.

DC: At $600-something each?

Kottke: That was the retail price. I don't know what the wholesale price was, so I don't know how many systems that entailed. As a ballpark figure, say $400 wholesale? That's a good markup. From $400 to $660? I think I came in on the tail end of filling that big order.

DC: Legendary numbers.

Kottke: And there was no daily production. It was just a batch job: You got a bunch of boards—you got 'em all stuffed at once—and then they all sat in a pile. One by one, a day at a time, we'd get around to testing them. It was very spotty work; we weren't working at it full-time. I was getting paid by the hour, and just a couple of hours a day; that's all it was. If I had been seriously looking for a job, I wouldn't have hung around. I liked the computer. I did my best, all summer, to learn how it worked.

DC: The summer of '76?

Kottke: In between my last two years of college. I went back for my senior year. I didn't have a full-time job at Apple anyway. At that point, Apple was a partnership and hadn't incorporated yet. And, during my senior year at school, Steve would call me up and tell me how things were going. He'd say, "We've got this great company started; you've got to come out and work for us!" So, the same week I graduated, I immediately came out. They'd incorporated in January 1977. And sometime in the fall of '76 Steve had met Mike Markkula, and the business plan coalesced; Markkula put in $90,000 and they formed

a corporation. They had to get the case designed, to get Rod Holt to design a power supply, and then they had a product.

DC: So when you came back that summer, how many people were there, and who were they?

Kottke: There was a real, functioning company. Mike Scott [then president of Apple] was the skipper (he's always reminded me of "The Skipper" on *Gilligan's Island*), and there were twelve people there. I was the twelfth employee. Rod Holt was chief engineer. Scott, Markkula, Holt.... Wozniak had a number but didn't work there full-time.... Sherri Livingston, who was Mike Scott's secretary.... Jim Martindale was production supervisor; he came from Atari.... Then there was Jobs.... I don't know how many we're up to.

DC: Seven.

Kottke: Randy Wigginton...Chris Espinosa—both of them were kind of working part-time, helping Woz out—and Don Breuner, who was hired just days before me. And Bill Fernandez. And I was number twelve.

DC: Wigginton's the author of *MacWrite*, but what did he do in the early days?

Kottke: Well, his first big claim to fame was working on Applesoft. At that point, Woz was personally having a hard time, and Randy was very helpful in getting Applesoft ready, which was important, because Integer [Basic] has many limitations. And I immediately started screwing together power supplies and base plates and keyboards. That was my first job: I had a screwdriver in my hand. Because it needed to be done.

DC: When did things really take off?

Kottke: The important milestones, to me, were around the fall of '77. Well, we shipped our first unit in June, then quickly jumped to ten, twenty, thirty or forty a day for a long time. I was in production for the whole first year, and when I left production we were still doing only fifty or sixty a day. The first manual was just a folder—Mike Scott threw it together in a hurry. The logo was black. And I remember seeing the first color Apple logo that fall. And I recall thinking, *This is significant*. It was such a great logo! And I just knew that the company was on good footing. It was just intuitive. It seemed like a good omen. God, a rainbow logo! Why doesn't everybody have a rainbow logo!

DC: Okay, how did the Macintosh get its start?

Kottke: Well, Steve got Macintosh to happen. He didn't start it—he kind of took it over from [Jef] Raskin—but he had the vision. And that's what he really sees as his job: He's Apple's visionary. Now, I think it's way too sanctimonious to put it that way, but, on the other hand, that's what he does best. He sets the general direction. And Macintosh was right on. No one else was responsible for it.

DC: What did Raskin originally have in mind?

Kottke: It was the idea of a small, personal, "appliance" computer, as opposed to a "hobbyist" computer. Now, the concept of an appliance computer has many issues, because in order to be an appliance it has to be simple, easy to use, and nonthreatening. You could almost say that, by implication, it has to be graphic. Now, Jef's machine was less than half the price [of the Macintosh]. On the other hand, it started in 1979, so....

DC: There were tremendous arguments, before release, about pricing the Macintosh.

Kottke: Personally, $1,200 was my limit. Now, again, I'd revise that, because that was years ago. But I'd still say that, if I didn't work at Apple—if I were a student—I'd say $1,500 to $1,600. I could see spending that much. If I were in a consortium school, I'd be really happy. Even then, you get the computer and the printer and the modem and you're talking $1,600. But students don't have much more money than that.

DC: If they have that much!

Kottke: Yeah. It's like a car. But I think that Macintosh is the first

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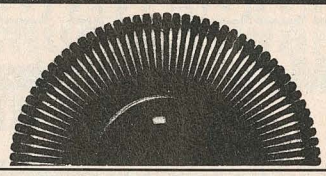

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"We're still unrolling Macintosh. We're still on trial. We've shown what we've got, but we've got to keep pushing it and supporting it."

product that Apple's made that I'd buy, even if I didn't work at Apple. Well, not unless I had a good job.

PR: Is Apple on the right track selling Macintosh as a business computer? We get a lot of letters from people complaining, "I bought one because I thought it was a 'business computer,' and it isn't!"

Kottke: The word "business" has a lot of connotations. "Letter-quality printing" is a pretty big part of it. If you go into the Macintosh building, you'll see many letters posted on cubicles that people have sent in, and they're basically business letters. Letterheads and so on. All printed with a Macintosh. And I think they look great.

And yet the laser printer is going to put the whole letter-quality issue to rest. The whole thing of "letter-quality" is like wearing a tie and a jacket to work. It's the same ethic. The real question is flexibility and "niceness" and aesthetics, and whether it makes your job easier. The Imagewriter is such a beautiful machine; the Imagewriter and Macintosh go together so well that I don't have a lot of sympathy for people who say, "It's not letter-quality!" But I do have sympathy for people who already have daisy-wheel printers and can't run them with the Mac. That's real bad. It took a while to convince Steve [Jobs] of that. But now we're fixing that, and that's a very high-priority project.

PR: This is way off the subject, but a friend realized the other day that the Macintosh doesn't have a Monitor [a ROM-based program that allows users to examine, change, copy, and disassemble blocks of memory]. And was he pissed off!

Kottke: Actually, what the Macintosh does have is a debugger program called "Macsbug."

PR: "Macsbug?"

Kottke: Yes. It's the general-purpose Monitor and debugger program that we originally got from Motorola for the 68000 and that was extensively rewritten for Lisa, then crunched down somewhat to run on Mac. You get into it by hitting NMI or having a break point in your code. The name comes from "Motorola Advanced Computer Systems" (MACS). There's also a desk accessory I've seen that just lists memory. I think when you have an integral disk drive like Macintosh does, it's not much of a disadvantage to have something like that on disk instead of in ROM. It's not used that often.

PR: So how can you get Macsbug?

Kottke: It isn't generally for sale—at least not yet—but you can certainly get it if you're a developer or a persistent annoyance. Or even a sincere seeker.

DC: And the nonmaskable interrupt instruction...that's like a crank in the microprocessor that you can turn to get things moving.

Kottke: Well, it's not an instruction. It's a button connected to a pin on the 68000. And all it does is send the processor to a specific address in memory from which it jumps to wherever you want—similar to the reset button. I don't think that's too technical for people to know. And the concept of a Monitor program is something people would probably like to know about also. Because that's—well, I was exposed to mainframe computers in high school. And I was not inspired, in any way, to deal with them. They were unfriendly, big boxes that were inaccessible. There was *no Monitor*! There were switches and lights on the front, but that was way too arcane. There was no simple way you could just go in and examine memory locations. And that's what was refreshing, and eye-opening, about the Apple II: All of a sudden the machine was yours! You could sit there, turn it on, and you had access to every byte of RAM. And that was what got me, personally, interested in the machine.

DC: And that's what a lot of people don't like about the Macintosh.

Kottke: That you can't do that. Yeah. But, the fact is, you can! It's just a different way of going about it.

PR: But with an Apple II, you can just buy one, then go in the Monitor, and....

Kottke: That's true. And, in some ways, the Apple II is a better instructional machine for that reason, because it's very simple. But it's a whole spectrum; because, at the other end, the Apple II kind of "breaks down" for doing high-level stuff—the processor doesn't even have interrupt or exception vectors. It's a very simple system. Macintosh is a whole order of magnitude up in terms of system complexity. Everything in a Macintosh happens on interrupts. You can have all these different simultaneous tasks—Macintosh can really be a concurrent machine, without much trouble. Your desk accessories are, after all, concurrent applications. You can have seven different applications running concurrently.

DC: On another subject, how's Sculley doing?

Kottke: Sculley's worth the money. I think Sculley's doing a great job.

DC: How much is Sculley doing?

Kottke: A lot. If I think back a year ago about the impressions people had of the Apple II division—"PCS" [Personal Computer Systems]—before Sculley, PCS has really pulled it together. They impressed all of us with the IIc and the IIc monitor. They just really got their act together. That's a great division! I don't know how much of that is Sculley's doing, though.

DC: I remember old PCS jokes. "What's the difference between PCS and the *Titanic*?" "The *Titanic* had a dance band." (*laughter*)

Kottke: I did hear that the Apple IIc event, in the [San Francisco] Moscone Center, was largely Steve Jobs's doing. They [PCS] were just going to have this modest press announcement for the IIc, and Steve Jobs went in and said, "Hey, c'mon! We're doing great things! Why don't you do great things too? Why don't you go rent Moscone Center?" And I think that's right on!

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DC: What would you like to see Apple make that it isn't? What's on the horizon?
Kottke: That's what is most visibly Sculley's influence, from my point of view: the unified product range. And he's the only one who can do that. Sculley is the guy who can unify these various divisions—such as the Apple II and thirty-two-bit families—and then group them together on a spectrum. Jobs can't do that, because he's too partisan, being general manager of the Macintosh division.
DC: But productwise, what's next?
Kottke: I think we've got our hands full, for at least another year, just building IIcs and Macintoshes and helping the software get out for the Macintosh. You know, we're still unrolling Macintosh. We're still on trial; we've shown what we've got, but we've got to keep pushing it and supporting it.
DC: Apple seems to want to keep the 128K Macs alive, but everyone I know wants a 512K machine. Everybody!
Kottke: The thing to remember is that the 512K Mac is going to be $1,000 extra worth of RAM. And there's no way around that. Not within this year, I'd say. But for new products—well, you know, inevitably there's talk of a "Big Mac," a "Cheap Mac," and a "Lap Mac." If you think about what the "Cheap Mac" is, that's exactly what we already have. The Mac we have is the cheapest thing you could get in terms of a usable configuration. And you could only go up from there: double-sided disks, 512K, color capability, two drives....
DC: So you keep the "Cheap Mac" and just crunch the price?
Kottke: That's right. And that's exactly what we need to do. The Apple IIe, for instance, is now being discounted to $800 or $900. And it'll get even cheaper.
DC: And to build a Macintosh must cost...under $500, easily.
Kottke: Well, it's hard to say, because it's very expensive getting a factory started up, and you've got massive amounts of overhead.
DC: So what do you include in the cost?
Kottke: Right. What do you include?
DC: Do you include Sculley's salary in the cost of a Macintosh?
Kottke: Another good point. (*laughter*) But the factory is really quite awesome. It's like being in a high-tech aircraft hangar filled with machinery.
DC: Is the romance gone from Apple? It's not like the days of twelve Apple employees.
Kottke: No, it certainly isn't. What I've seen over the years are teams of people that swell up and balloon in order to get a product out the door, then level off and slow down a bit, then eventually disperse. It seems like often the people who contribute the most tend to be the ones who get restless to move on to something else. But, you know, with all due credit to Steve Jobs, it's perhaps getting to be time for him to start putting together another small group. In 1980, it was getting the same way: The Apple III was out, and everybody was exhausted, going on leaves of absence, and Steve went in and started hand-picking people to "go to work on this little project"—the Macintosh. And it was like this new, little company—all over again. We moved out, moved into our own little offices—it was just like being a new company. Except that we didn't have to worry about expenses. Steve could do that again, and maybe he will.
PR: Do you think he'll do it around something Alan Kay's working on?
Kottke: That's a whole 'nother question. I think Alan's great, but I tend to be a little skeptical....
DC: There's not much evidence of his "greatness."
Kottke: My evidence is talking to him. In fact, everyone who talks to him that I know—well, you know Mike Boich [Mac "Software Evangelist" and *MacTerminal* author]? It was funny—one of the first times that Alan came to Apple, he was by to see Steve Jobs, and Steve was busy and handed him off to Mike Boich—like, "Here, keep this guy busy for a while!" Well, Mike said he took Kay into the demo room and was showing him *MacTerminal*. But Boich said he could only take it for ten or fifteen minutes because Alan was overwhelming him! It was like, "This guy is just too smart! I can't take it anymore!" (*laughter*) Coming from Mike Boich, that's a compliment, because Mike's a really bright guy.
DC: But is Alan Kay "all heat and no light"?
Kottke: Well, he's *all* light, actually—the guy's brilliant. But one of the things about Alan is that he's very far ahead of the times. And that seems to be where he wants to be. But he doesn't have a reputation for shipping products.
PR: Maybe he doesn't want to make "real products."
Kottke: Which is fine. That's great! It's kind of like being a nuclear physicist—you're so far removed from reality; you're dealing with equations all the time. And yet, your work is very valid and necessary. Actually, I get the impression that Alan sees himself as specializing in user interfaces, which is potentially a very tangible subject. After all, like the Skeptic philosophers said, all you really know or experience is what you see, touch, hear, etc. *That's* user interface! I don't know. Alan worked on Dynabook, which was clearly way ahead of its time, so you can't blame him for not shipping that one! Then he worked on the Star 8010, whose fate is surely mired in the monolithic heart of Xerox. (*laughter*)
DC: Let's talk about important new products. Is there color in Mac's future?
Kottke: Well, it's like this. It's not that hard to design a Mac or modify a Mac to put out, say, sixteen-color RGB to an external monitor. You could even use the current Mac CRT and get sixteen-level gray scale and use color-mapping registers to get four thousand colors or so. The additional cost is mostly just in the extra RAM to quadruple your screen buffer from 20K to 80K and the cost of the RGB monitor.
PR: Then a color Mac wouldn't have the color tube built into the box?
Kottke: Probably not. You'd want to use the same black-and-white tube and have an external RGB video connector. Apple's even announcing an RGB monitor this summer. So, obviously, it would make sense for us to use that monitor.
DC: How big is it?
Kottke: The same size as the IBM monitor.

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PR: Twelve-inch?
Kottke: Uh, yeah. I think it sells for five hundred-something. It's a pretty good price.
DC: More, more! Is the color Mac...pretty?
Kottke: Yeah, and—
DC: Can you set the background colors and the text colors? Menu bar color!?
Kottke: Of course you—
DC: Color, gee! Can you—
Kottke: No, those are—wait, wait, wait! Let's get this straight. The biggest question is how do you deal with all these colors in software—you have to have all kinds of new menu items and options and preset values. And then, relative to other things like disks and modems, is it useful and necessary enough to justify the cost? It's a big software job; and, of course, you can't make a product out of just the hardware, you need a complete package. I think a color Mac would be great, but I'm not sure it would necessarily get more work done. It sure would look nicer.... I mean, years ago we all thought that the Apple III was such a great machine because it had that sixteen-color RGB hi-res, which looked so beautiful, and all you needed was an RGB monitor. And yet, how much software do we see exploiting that color? None! In fact, with an extended eighty-column card, you can get the same color out of an Apple IIe. And I still haven't come across much great color software—other than games, of course. Still, I'd like to think that we'll put color capability at least in the hardware in a future Macintosh.
DC: How do people in the Macintosh division feel about Lisa?
Kottke: You know what really bugs me? This is something that I'd like to see in print: I hear talk, even within Apple, about the Lisa being a "failure." And that really irritates me, because I'm proud of Lisa. I think it was a great success, even though it wasn't a "profit center." It made its money back. It wasn't a loss. The fact is that Lisa established us firmly as a technological leader, which is a very important thing. Just think if Lisa hadn't worked. I mean, the Apple III was...kind of embarrassing—for a while, at least.
PR: But how much of Lisa's "failure" was the machine's fault and how much was marketing?
Kottke: Marketing kind of overestimated the extent to which Lisa would sell itself.
PR: That's an understatement.
Kottke: But that's basically the issue—that it was marketing, not the machine itself. Overestimating sales potential leaves you with pricing that's too high in general, and our strategy of bundling everything together made for an uncomfortably high entry-level price. Another thing that hurt was not having the software development Toolkit ready earlier. Developers really needed Toolkit to make third-party software, but the whole thing kind of stumbled and faltered. It was a mammoth project and took everyone's energies just getting the whole package to work in the first place.
DC: Is Macintosh going to "save" Lisa?
Kottke: I don't think there's necessarily a relation. Macintosh is a very good thing for Apple in general. Lisa was a stage we went through that was successful in some ways and not successful in others.
DC: But lots of people go out to buy a Macintosh and decide they need a Lisa instead.
Kottke: That's right; Lisa's a more powerful machine. A lot of people need that megabyte of RAM to deal with very large documents. And a lot of people want the convenience of multitasking. Lisa's also a great Unix machine.
PR: Are the rumors true that Apple's phasing out Lisa and discouraging Lisa software development?
Kottke: I think that makes no sense at all, for the reasons I just described, but if I say any more, it'll be my job that's phased out!
PR: Is Apple going to kill off the ProFile hard disk?
Kottke: Maybe what you mean is will Apple continue to use the current five-megabyte Seagate drive that we build into ProFile? That's like asking if we'll continue to use 64K RAMs in our computers! For years we've all watched RAMs and disk drives get denser and cheaper—and then, of course, the whole point of our own ten-megabyte Widget project [Widget is Apple's name for the hard disk within the Lisa 2/10] was so that ultimately we wouldn't have to go outside the company to buy our drives. If we acknowledge that hard disks are desirable and here to stay, it makes good business sense to try and build our own. The other side of the issue is that hard disk drives are very difficult items to make reliably and in high volume. And do we think we can compete effectively with all the other companies who do *nothing* but make these drives? Hmmm.... I would expect that Apple will continue to make a product called ProFile regardless of whose drive is in it.
PR: How close are we to seeing a 512K Macintosh?
Kottke: I think that 256K RAM availability is a questionable issue. Devices that dense are starting to really push the limits of existing wafer-fab equipment. It's a question of the chip vendors improving their yields enough to bring the price down. The 256K RAMs are still many times more expensive per bit than 64K RAMS.

I heard a curious thing the other day about 256K RAMs. An engineer at the Mac factory was talking about some 512K Macs that we were building up, and the RAMs seemed unusually susceptible to "flyback RFI." The flyback yoke in any CRT produces a big, whopping electric field. And one of the problems has always been shielding the disk drive from that field. Well, the transistors that make up the 256K RAMs are very tiny devices. And the smaller the device, the smaller the currents. And the smaller the currents, the greater the significance of "background noise" such as the electromagnetic field from a flyback yoke. At some point, the field will cause failures of the device. We're going to have to be very careful when we start making 512K Macs to test them for this type of parasitic effect.
DC: What about the 800K, double-sided drives for Macintosh?
Kottke: That's similar to the 512K Mac question. It's mostly up to our vendors—that is to say, Sony, in this case.
DC: End of the year?
Kottke: Could well be. The double-sided drive is more a matter of gearing up production—it's not a thorny engineering problem.

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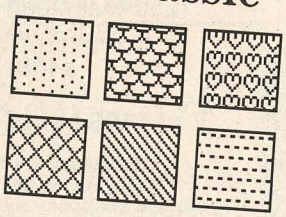

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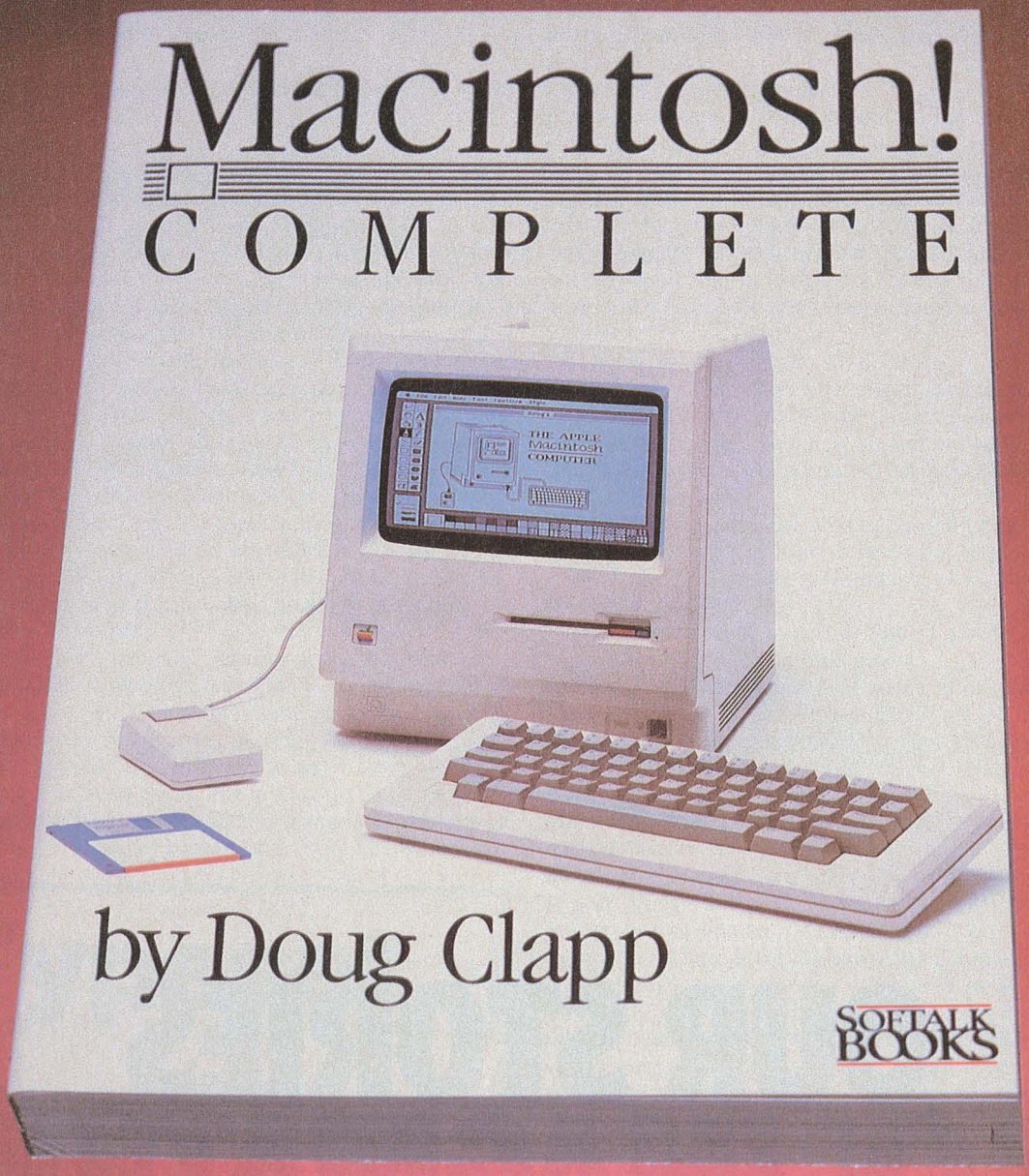

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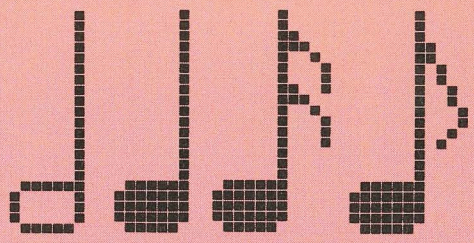


Charms To Soothe the Savage Mac

MacPaint is particularly well suited to manipulating small symbols to make a pageful of graphics. As such, it is adept at creating notes, staffs, clefs, rests, and so on and putting them together into a page or two of music. Given that the program can deal with only a page at a time, it would be a nightmare to use it to print Beethoven's Ninth Symphony—wait till *MacDraw* comes out for that—but for a small composition or for your part of a quartet, this technique is kind of nice.

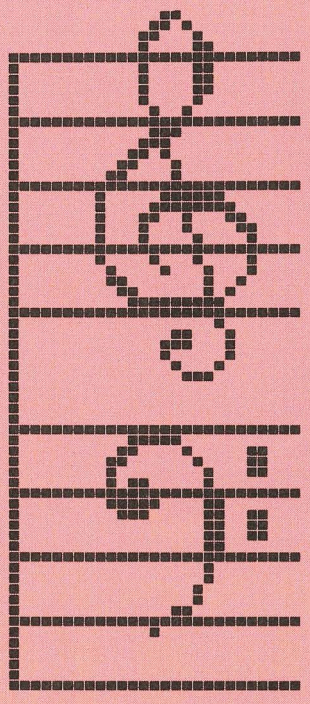
To get your *MacPaint* ready to print music, your first task will be to make a set of notes and staff lines on the *MacPaint* screen and save them to disk. If you plan to do lots of music printing, it's a good idea to set up a disk devoted to this one task. An entire printed page of music takes up a lot of space on disk. The disk will have to contain a Finder, a System, an Imagewriter file, a Scrapbook file, and *MacPaint*. To save space, you can move all unnecessary fonts out of the System file with Font Mover and clear all unnecessary pictures from the Scrapbook. It is, of course, up to you which fonts you use. A few sizes of Geneva or New York plus the fonts required by the Finder will probably be enough.

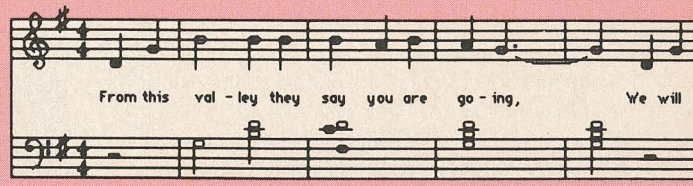
The accompanying Fat Bits picture shows how the notes can be drawn; you can copy these or modify them to suit your taste. You'll need a complete set of notes, rests, and other symbols. Allow enough space around each note to get a lasso around it easily. The staff lines are spaced five dots apart and the notes are five dots high by seven dots wide. The note stems should cross two and a half staff lines and so should be about sixteen dots long. Time signature numbers in the illustrations are twelve-point Venice.

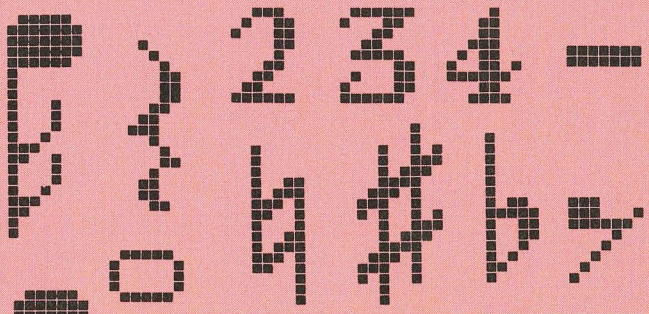
Once you have all the symbols in a neat working group, set up the left edge of a set of staff lines with the treble and bass clefs in place. Then save the whole collection to a page of the Scrapbook, as shown on the accompanying Scrapbook page. To get started working on a page of music, copy the page from the Scrapbook and paste it into a blank *MacPaint* document.

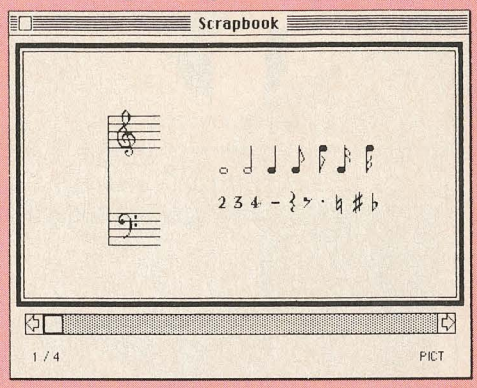
(Alternately, you may wish to create a *MacPaint* page of blank staff lines and duplicate it whenever you want to start a new page of music.)

A few of the items mentioned on the *MacPaint* Shortcuts screen make this whole process a little easier. For instance, you can keep staff lines straight and level by using the straight-line tool in conjunction with the shift key, which restricts movement to one axis. If your first motion is vertical, with the shift key held down, only vertical motion will be allowed: instant measure bars. The same goes for horizontal movement: easy staff lines.









Using the lasso to grab a note allows you to place the note on the staff without having to redraw the staff lines. Holding down the Option key when you pick up the note makes an instant copy of the note, leaving the original behind. This shortcut alone saves you a lot of copying and pasting. An easy way to extend a staff is to drag a selection rectangle around its end and shift-Option-drag to the right.

Note that because the hollow whole and half notes are fully enclosed, they obscure staff lines underneath them, so the lines have to be redrawn in some places.

Other hints:

If you're copying music from another source, it may be easiest to place many of the same kinds of notes at once, then add other kinds of notes in between. With so much copying going on, it may be easiest to keep a finger on the Option key at all times. It's nearly as important as the mouse button.

To erase small errors, use a small brush shape with white instead of the eraser tool. To erase large errors, use the lasso or the selection rectangle and the backspace key.—Gene Mauney, Elon College, NC

The Protection Racket

One of the more frequently overlooked advantages of the Macintosh over other computers is that the Sony disks eliminate the need for those old-technology, sticky write-protect tabs. If you haven't had the pleasure, a write-protect tab, old style, was a glorified piece of tape that covered a notch in the disk. With the notch uncovered, a switch in the disk drive slipped into place, informing the computer that it was okay to write to the disk. With a tab covering the notch, the switch could not fall into the notch, and the computer would be prevented from saving or deleting files and from reformatting the disk.

The basic idea was good, but the execution was weak. The tabs stuck to everything, but once you peeled one off a disk it would stick to everything *but* the disk. And there were never any around when you needed them.

The analog to the write-protect tab is built into the Sony disks. The principle is the same but it's much better executed. Instead of sticky tape, the tab is a piece of plastic that slides back and forth in the notch. Look at the disk

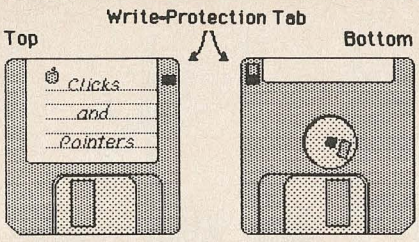


Figure 1. Apple-made disks.

(figure 1) from the top, with the aluminum disk door facing you. In the far right corner is a small rectangular hole. If there is a red piece of plastic showing through that hole, the disk is not protected (in this case, red seems to mean *be careful*). If you can see through the hole, the computer won't be able to write on or erase the disk. To change the write-protection, turn the disk over and slide the red plastic piece to the opposite position.

If you have a disk sold under the Sony or the Hewlett-Packard label, or from some manufacturer other than Apple, you may be a bit confused by now. Some of these disks don't have a hole through which you can see the write-protection status from the top of the disk (figure 2). Instead, you have to turn your disk over and look at the bottom. There are three possible positions (or four, if you're careless) for the tab on these disks, and it's not immediately obvious which is which. These disks seem to be of a pre-Macintosh design. Sony seems to have switched to the Apple-style tabs, and, with any luck, other companies will follow.

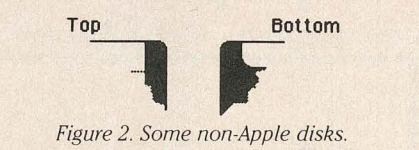


Figure 2. Some non-Apple disks.

Figure 3 shows the four possible positions of the tab on the older disks. In the first position, the tab is an integral part of the casing. This is the way the disk comes from the manufacturer. It is write-enabled; that is, the computer can write on, erase from, or reformat the disk. The tab is connected, however, by only the thinnest piece of plastic. The plastic can be broken by bending the tab outward. With the tab removed, the disk is write-protected.

You shouldn't leave the tab in this second position with the tab completely removed, because once you lose the tab you will have difficulty write-enabling the disk again. Turn

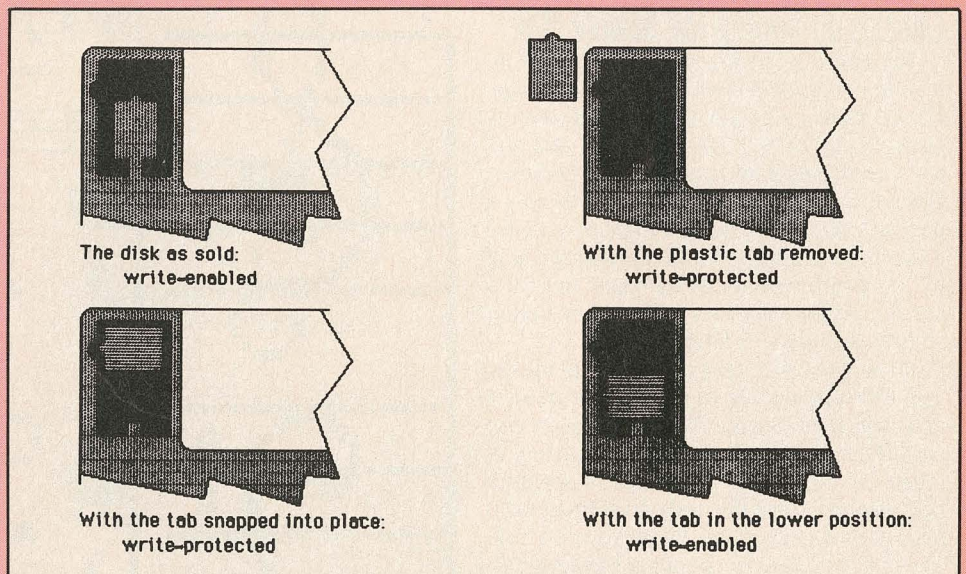
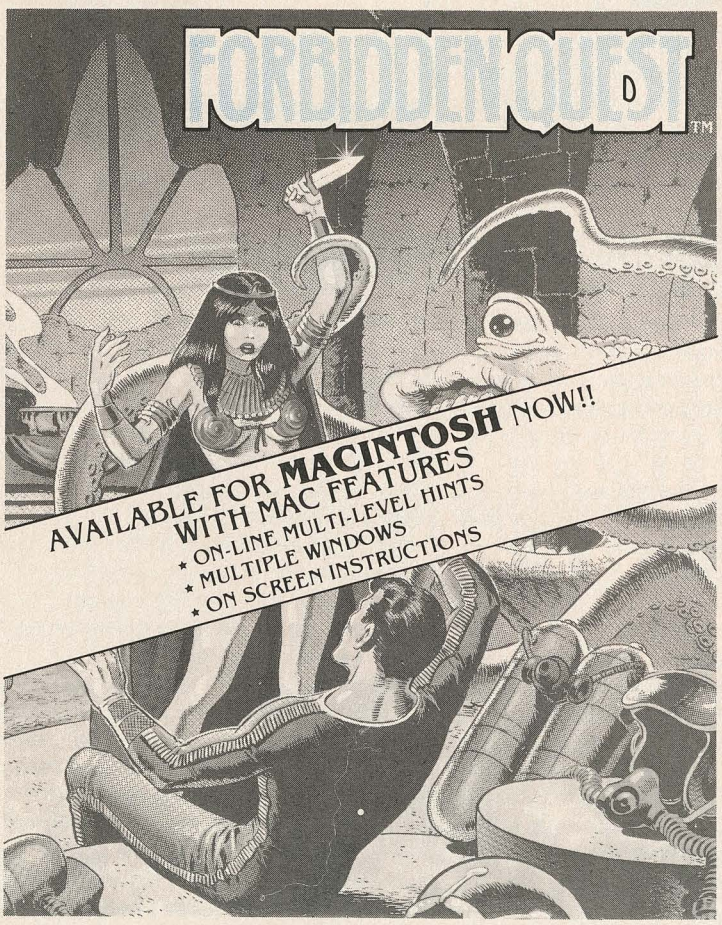


Figure 3. Write-protection on some non-Apple disks.



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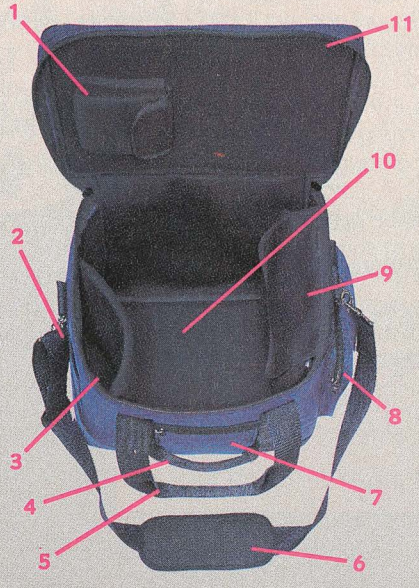

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the tab around so that the tiny plastic bump on one of its ends fits into the tiny dimple in the left side of the hole. Push the tab into place. This third position is write-protected as well, but if you have reinserted the tab correctly you should easily be able to slide the tab back and forth between the third position and the fourth, which is write-enabled.

The question may remain, why would you want to make a disk so that it can't be written on? The traditional answer for traditional computers is that there are typically two kinds of disks: program disks and data disks. You obviously need to write on data disks, but program disks are often uncopyable, so you can't make backups; and you don't want to take the risk of destroying them. The Macintosh operating system frequently writes on disks even when you don't think you told it to. For instance, any time you change an icon window in the Finder, any time you write to the Note Pad or the Scrapbook, any time you change Control Panel settings, and any time you cut or copy something to the Clipboard, information will probably be saved to disk. That means, in most situations on the Macintosh, you won't want your program disk or your data disk to be write-protected.

So when do you want a disk protected, you ask again? Other situations may come up as different programs are released, but the one time it is clearly useful right now to write-protect a disk is when you are copying it. When you're using DiskCopy especially, there is the danger that you will put the wrong disk in at the wrong time and destroy the disk you meant to make a backup of. To be entirely sure you won't do that, write-protect the disk you're copying information from and write-enable the one you're copying to. Another time when write-protection might be the better part of valor is when you have just made a backup of some very important data. Before you put the backup disk in a drawer for safekeeping, slide the tab to the write-protect position for slightly safer keeping.

One more thing to remember: If the computer complains to you that the disk is "locked" and can't save the file you've been slaving over for three hours, don't panic. Eject the disk (hitting shift-Command-1 should work in most situations; otherwise, use the paper clip ploy), change the position of the write-protect tab, reinsert the disk, and try again. That's the trouble with the Mac's "user-friendly" terminology. Experienced computerists may not realize that *locked* means *write-protected*, and neophytes may not know how to correct the situation even when they understand it. The computer will be really friendly only when, upon receipt of a baffling message, a user has the option of typing in, "Huh?"

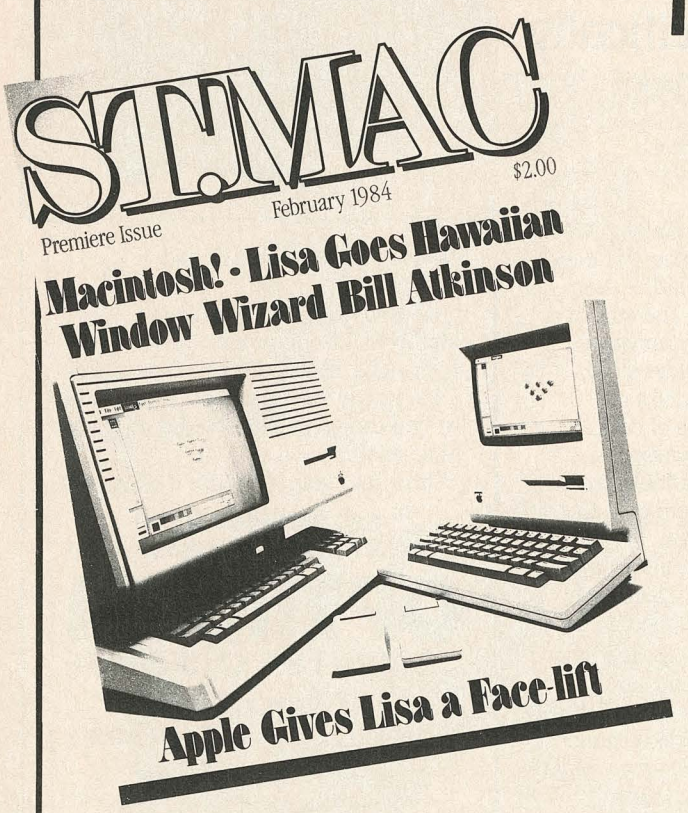
More Crash-Defying Rescues

Here's another way of retrieving files from crashed disks. It may work in situations that would foil the file- and disk-saving techniques heralded in the June Clicks & Pointers—further proof that the best way to get along with computers is to be smarter than they are.

If you crash a disk that contains data files and can't get it back as a whole, you may at least be able to get those precious documents off of it. Open the relevant application program (if the files you're trying to get are *MacWrite* files, for example, then open *MacWrite*). Close the untitled document that this action brings up and select Open from the File menu. Click on the Eject button in the dialog box and insert the crashed disk.

If the Macintosh rejects the disk, if the system crashes, or if no files show up to be opened, the technique didn't work for that disk and it may be time to resort to panic. If, however, you do get file names in the dialog box, you should be able to open the files and then save them onto another disk. Repeat the procedure until all the files are safely returned to their loved ones. This technique will, of course, involve some disk-swapping (unless you have a second disk drive), but it can all be accomplished using that Eject button.

Obviously, this method can only recover documents, not applications. Then again, people who don't back up applications programs are like people who walk around in the subway at night with hundred-dollar bills hanging out of their pockets: They're just asking for it.—Doug Weathers, Norton Air Force Base, CA



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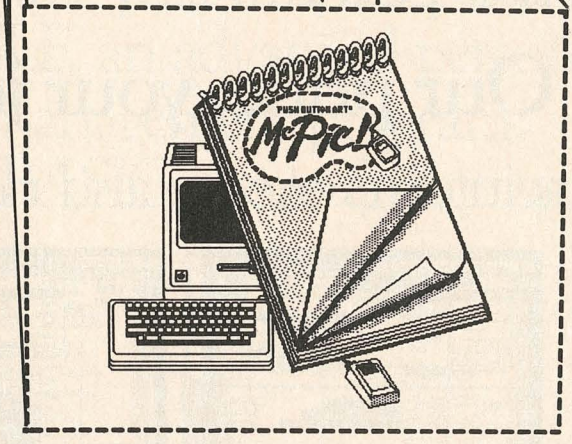

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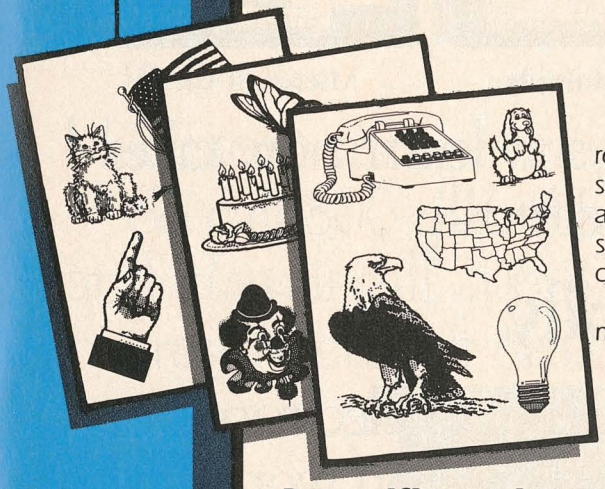

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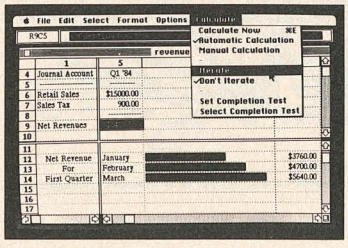

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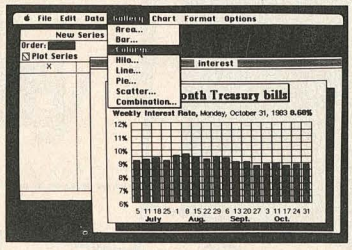

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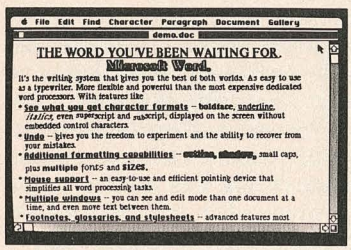
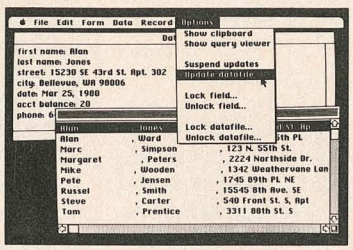


Microsoft Word



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ThinkTank

An Idea Processor Moves to the Mac

By Christopher Allen

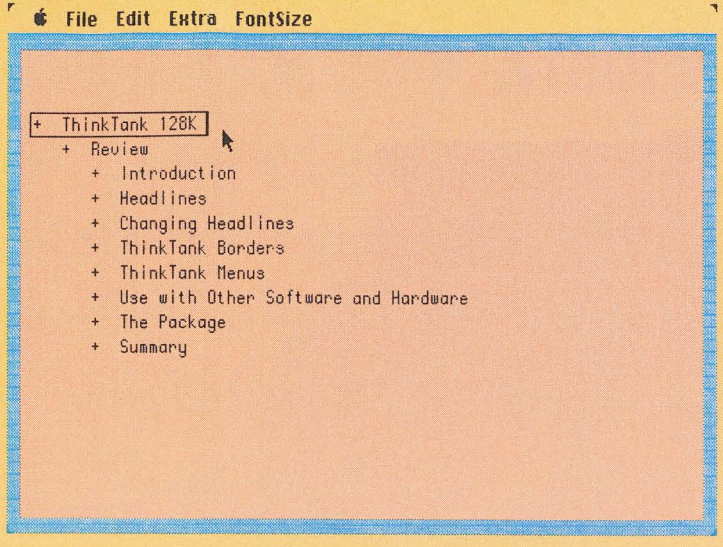
Are you looking for an easier way to organize your ideas? Do you need a way to get more mileage out of your creative thoughts? Maybe *ThinkTank*, from Living Videotext, can help.

The computer equivalent of the blackboard or index cards, *ThinkTank* is an "outline spreadsheet" or "idea processor" previously available on the Apple II, the III, and the IBM PC. It allows you to express your ideas and impulses as they come to you—once you've recorded them, you can develop, arrange, and reorganize them any way you like. *ThinkTank* can be a brainstorming tool, a writer's helper, a problem manager, a project director—in short, you can use it for any purpose that requires planning or organizing. Apple cofounder Steve Wozniak even used one of the earlier versions of the program in organizing the US Festival and Technology Fair.

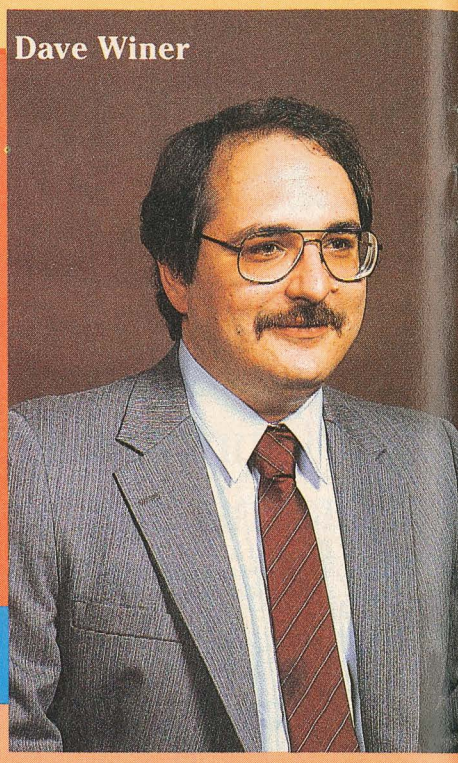
Using *ThinkTank* is easy. You just create outlines. The power of *ThinkTank* is that not only can you edit your text, you can also edit your organization. Once you have your ideas organized, you can focus on filling in the details.

Headlines

To understand the value of *ThinkTank*, you have to understand how its outline processor works. Each *ThinkTank* outline document is composed of "headlines," and each headline can have "subsidiary headlines," or subheads, associated with it. These subordinate headlines may have subheads following them. The topmost headline is called the "summit." Every headline you add is a subhead of the summit.



A collapsed ThinkTank *outline.*



Dave Winer, the president and founder of Living Videotext, is the creator of *ThinkTank*, the first "outline processor." There are currently four versions of the program available, one for the Apple II, one for the Apple III, one for the IBM PC, and one for the Macintosh.

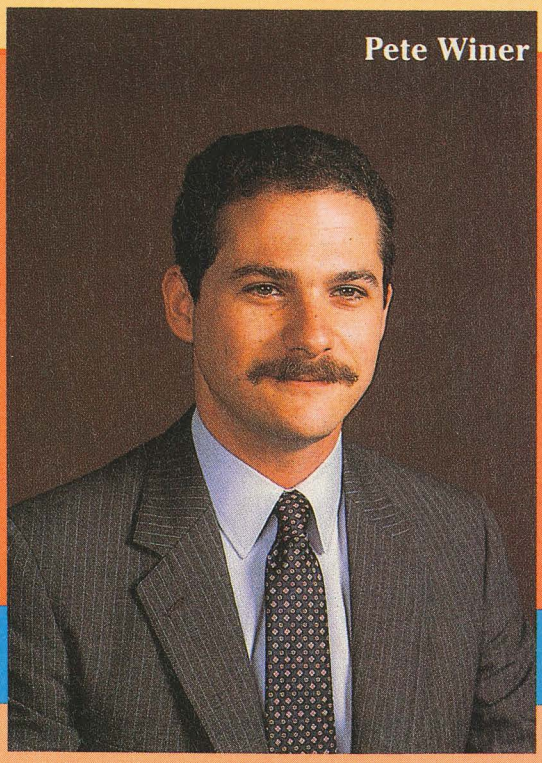
Winer can remember when the first spark hit him for the outline processor. It was in 1979, when he was a graduate student at the University of Wisconsin. There he often did work in Pascal. Because Pascal is a structured language, Winer was using a structured programming editor that broke up the program into a hierarchy of subroutines.

One day his girlfriend stopped by to visit and Winer showed her what he was doing. "She wanted to sit down and try it," says Winer, "and I said, 'Wait a minute. You can't do it, because it's made for programmers.' About two weeks later, I realized that if the structure made sense to her and she had a good feel for how to get started with it, then maybe there was something bigger here than just a tool for Pascal programmers."

From there, it was just a matter of implementing his idea. Winer worked on a crude version of *ThinkTank* and a database manager in Wisconsin, but he realized that there was just not enough critical mass there to make a go of it. So he packed up everything into a van and headed for California with the goal of working for Apple Computer. He had several talks with the software development arm of Apple, but the people there said that they were interested only in the database manager. Winer felt that his outline processor was the more innovative idea.

After his lack of success with Apple, someone there guided him to Personal Soft-

THINKING AHEAD


Pete Winer

Photos by Ron May

ware, now called VisiCorp. There he became employee number 12 of a firm that would eventually employ more than 250 people.

"I learned a tremendous amount about how businesses grow from VisiCorp," recalls Winer. "How they start off small and grow into something huge. You have to give them credit. They were pioneering something that nobody else had done before. However, there were many mistakes made—a lot of zero-based planning where one week there would be one direction and the next week everything would shift. It was very frustrating in that period."

The relationship with VisiCorp lasted more than a year and a half and did not work out well for the outline processor. In 1982, VisiCorp successfully introduced four new products, *VisiTerm*, *VisiTrend/Plot*, *VisiFile*, and *VisiDex*. A newly installed management team directed that the development of an outline processor be stalled in order to develop a word processor. So Winer and some friends had a parting of the ways with VisiCorp.

Winer started Living Videotext to resume development of the outline processor that eventually became *ThinkTank*.

"We originally budgeted four months to develop *ThinkTank*," says Winer, "but now I know that it takes eight months just to get off one machine and onto another."

The first version of *ThinkTank* was introduced in April of last year for the Apple IIe and used the p-System. In February of this year Living Videotext introduced the IBM PC version of the program.

Dave Winer's brother, Pete, actually implemented the Macintosh version of *ThinkTank*. Living Videotext had been exposed to the Macintosh early because the Apple IIe version of *ThinkTank* was so well received.

Pete Winer had been working for a variety of different manufacturers in the Boston area as an independent consultant when brother Dave asked him to come to California to develop *ThinkTank* for the Macintosh.

"The first thing we did was transport our source code to the Lisa," Pete Winer remarks, "and make some minimal changes between Apple Pascal and Lisa Pascal. Within a week or so, we had the Apple II product running on the Macintosh."

However, Pete and Dave both recognized the need to make full use of the Macintosh mouse and bit-mapped screen. "The Macintosh screen is very powerful, capable of representing an awful lot of different things," says Dave Winer. "But screen performance is the key. On the Macintosh you have to find the performance; it's not sitting there staring you in the eye.

"We went through a period of time when we weren't sure we would be able to manufacture a product on the Macintosh. We just won't ship a product whose performance gets in the way of the user. A good program has to live with the user in the front of his brain. It has to be there.

"The real barrier in programming for the Macintosh is not the program code," he continues. "It's understanding how the Macintosh really works. Questions have to be asked. How and when are the users of the Macintosh going to use the keyboard and the mouse? To what extent do we use the pull-down menus? It took us a good four months just to get past those hurdles."

Pete Winer adds, "I've talked to quite a few other developers, and we all agree that the Macintosh takes a new attitude toward developing software. The reason is that you don't have to jam-pack all of your functionality into the keyboard."

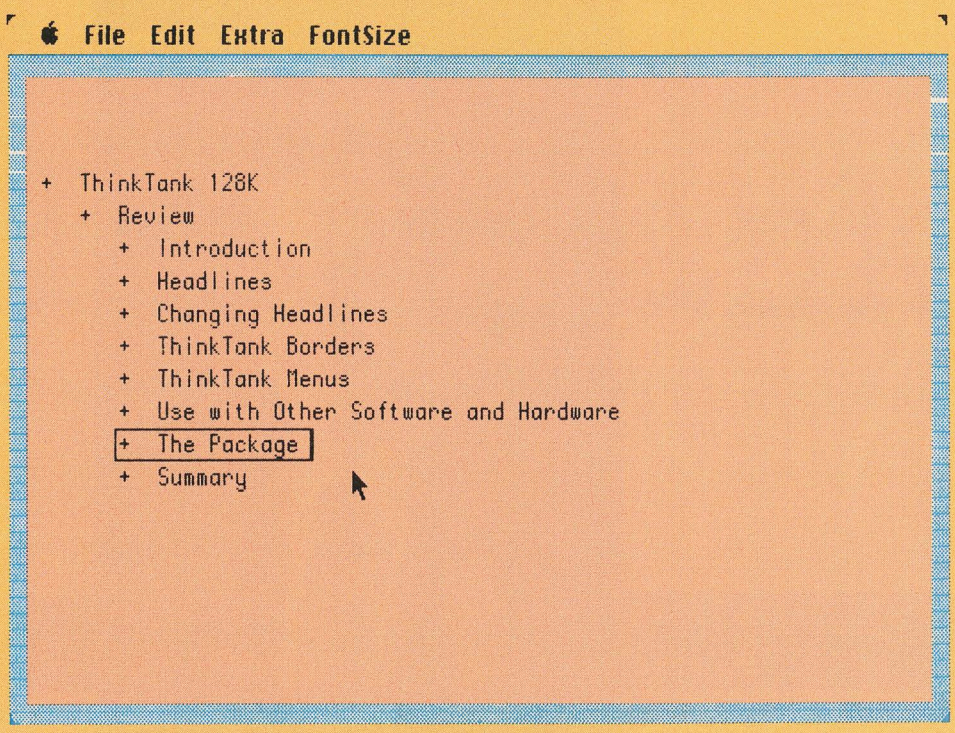
Dave and Pete Winer both found the release of the Macintosh an exciting event. "We got to watch the Macintosh develop," Pete says. "We suffered a little bit, because there were soft spots where we had to wait while Apple's software was being developed. But Apple was extremely helpful—at one point they sent two software engineers to our office to help us out."

After many hurdles, the Macintosh version of *ThinkTank* was released in late June. The Winer brothers are already working on new products.

Comments Pete Winer, "We're going in two directions that I can tell you about. We will be offering new versions of the product, including one for the Apple IIc that is patterned after the Macintosh product. And we're enhancing our IBM PC version; we expect to have a new release for the fourth quarter with some exciting new features.

"We also want to continue to pave the way, to define our new product category of 'idea processing'," continues Pete. "We believe that we have a jump on the rest of the pack because we've been at this for more than four years and feel confident that we can stay ahead. We're going to make ourselves a moving target."

As the Macintosh continues to push "think" technology to its limits, Dave and Pete Winer will both be there to offer new features for their existing products and ideas for new ones. To quote Pete Winer, "That's what life's all about!"



Selecting one section to explode.

The headings and subheads on the screen reflect your sense of how topics, facts, or ideas relate to each other. Each indentation from left to right indicates a deeper level of outline. The only limit to the depth of subheads is available memory.

As well as showing how deep every headline is, *ThinkTank* precedes each headline with a "leader" character. The leader character tells you if there's an indented subhead underneath the headline; a "+" signifies that there are subheads, a "–" indicates that there are none.

Each headline can have up to seventy-two characters. The major difference between the Apple and IBM versions of *ThinkTank* and the Macintosh version is that this version does not allow you to associate text "paragraphs" with each headline. This limitation results from the fact that *ThinkTank* keeps all of the outline in the Macintosh's RAM memory. Once 512K Macs are available, however, a new version of *ThinkTank* will take advantage of the extra memory.

One thing that's hard to get from paper outlines is a sense of balance. By allowing you to look at an outline from many different levels, *ThinkTank* enables you to balance your outline. You quickly see when a headline needs to be subdivided or combined with other headlines. This ability to see the balance also helps prevent you from falling into the trap of overstructuring the outline.

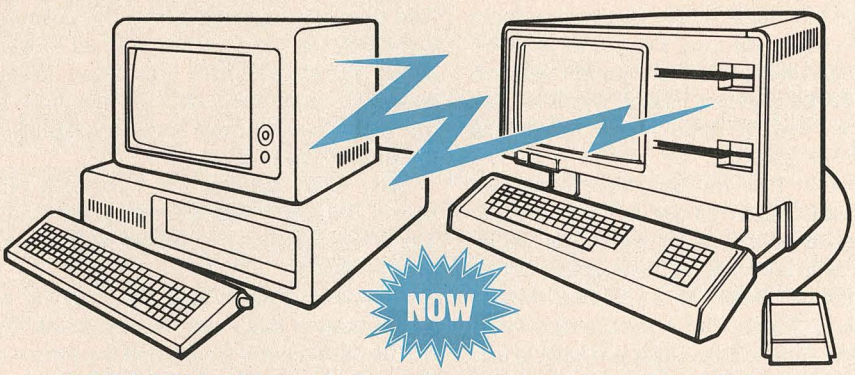
```
.HEAD 0 + Think Tank 128K
.HEAD 1 + Review
.HEAD 2 + Introduction
.HEAD 3 - Organization versus creativity--you want both
.HEAD 3 - Electronic blackboard or index cards
.HEAD 3 - ThinkTank "outline spreadsheet" and "idea processor"
.HEAD 3 - Just create outlines
.HEAD 2 + The package
.HEAD 3 - Large box: 8 1/2 x 10 with slipcover
.HEAD 3 + Documentation: 48 pages--7 1/2 x 9
.HEAD 4 - Same size and binding as MacPaint doc
.HEAD 4 + Divided into six sections
.HEAD 5 - Introduction--Philosophy of ThinkTank
.HEAD 5 - Learning Think Tank -- Quick intro
.HEAD 5 - Using Think Tank--step by step of all functions
.HEAD 5 - Reference--quick lookup of functions
.HEAD 5 - Error messages
.HEAD 5 + Good multilevel index
.HEAD 6 - looks like it was done with ThinkTank
.HEAD 4 + Manual contains registration card for free backup disk
.HEAD 5 - Registration card has serial numbers
.HEAD 5 - Free replacement of disk for 90 days
.HEAD 5 - For one year, replacement fee is $25
.HEAD 3 + One copy-protected disk, version 1.000
.HEAD 4 + This is a problem, as you cannot lock disk (because of print)
.HEAD 5 - When you lock, it bombs on printer options file
.HEAD 4 - Your program disk may not be in the external drive
.HEAD 4 - Inconvenient when using with other programs
.HEAD 3 + Entering Think Tank
.HEAD 4 - Finder 1.1
.HEAD 4 - Standard double-click of application icon or doc icon
.HEAD 2 + Headlines
.HEAD 3 + The screen
.HEAD 4 + The ThinkTank outline document
.HEAD 5 + Headlines and subheadlines
.HEAD 6 - Each level of indentation from left to right
.HEAD 6 - Leader characters "+" and "-"
.HEAD 6 - Top one is "summit"
.HEAD 5 - Can't associate normal text with headlines
.HEAD 2 + Changing headlines
.HEAD 3 - Click at any point in a headline for insertion point
```

Changing Headlines

Changing a *ThinkTank* document is easy. You can choose to edit the text in the headline or to move that headline and all its subheads to a new place within the outline.

To select any headline, just move the mouse to it and click. Once you've selected any headline, you may click the mouse again to move the text insertion point. To edit a headline, you must backspace over old text and replace it with new. Cut and Paste only work with the entire headline, so you must edit with the backspace key.

Once you've selected a headline, you can drag it, with all of its subheads, anywhere else in the outline. You may also use several Command-key shortcuts. Command-U takes the



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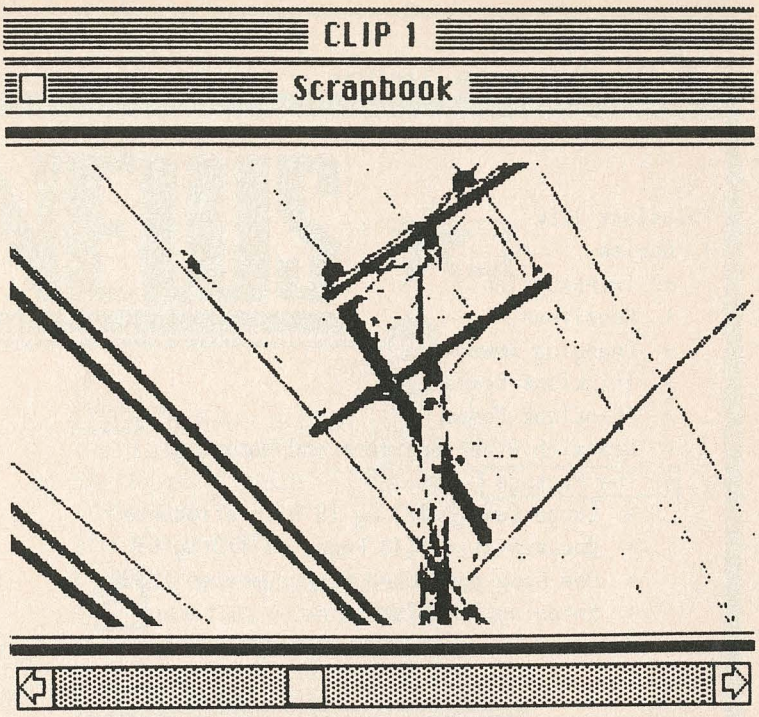

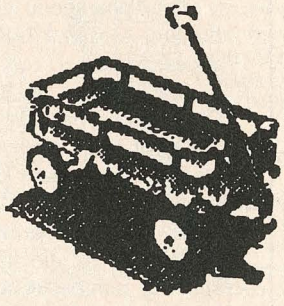

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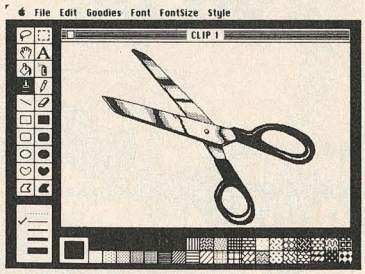
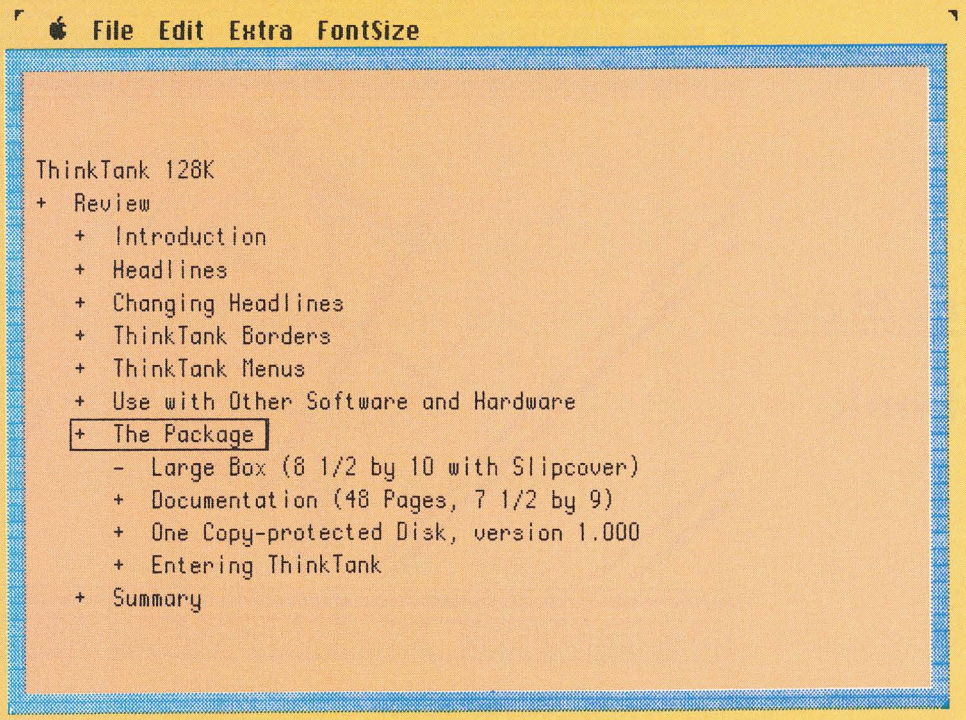


CLIP ART FOR THE MAC **CLIP 1**



An outline exploded to show the details.

selected headline up, Command-D down, Command-R right, and Command-L left. This capability is useful, because it means that you don't have to take your hands away from the keyboard. It would also be convenient if the arrow keys on the Macintosh calculator keypad functioned, but they don't.

You may double-click the selected headline to "expand" or "collapse" it. When you collapse a headline, all subheads under it will be collapsed also. This is useful when you want to "hide" headline details that don't interest you at the moment.

One option that's not available in *ThinkTank* is the ability to explode headlines so that you can see all the subheadings beneath them. Collapsing the summit of a large outline will collapse all the subheads under it. Getting back to a completely open outline requires many double-clicks to open all headlines, and you invariably miss a few. An option that would enable the user to explode *all* headlines and subheads would be useful.

ThinkTank Borders

One thing you'll notice immediately about *ThinkTank* is its window. Around it are gray "borders." These borders are "hot." When you click or press a border, the outline scrolls away from that border; this is useful for scrolling up or down a line or for moving to the left or right one character. You may also click on any corner for a diagonal scroll! Double-clicking the top or bottom border scrolls you up or down one screen.

The substitution of gray borders for the standard scroll bars is a Mac user-interface tradeoff. The gray borders are less familiar than the more standard scroll bars and boxes, but they are still quite intuitive. They give you more room on the screen than the standard bars do, and the diagonal scroll is particularly useful with outlines.

The user interface does take a little getting used to. You have to be careful not to accidentally double-click the border, thus moving the screen too far. One also misses the ability to see graphically where one is in a document.

ThinkTank Menus

There are five options on the menu bar—Apple, File, Edit, Extra, and FontSize.

The Apple menu lets you check the version number of *ThinkTank* and use all the desk accessories.

The choices on the File menu are New, Open, Close, Save, Save As, Page Setup, Print, and Quit. Page Setup allows you to set paper type and orientation. The "wide" option is often useful; because it will print sideways on the page, it lets you print deeper outlines. Print allows you to specify the print quality, line spacing, number of copies, and type of paper feed, and to choose to have the leader characters (+ or −) printed. It would be nice if another option could be added here to allow the printing of numbered outlines.

The File menu allows you to cut, copy, and paste selected headlines and to show the Clipboard. You may also use the standard shortcuts—Command-X for cut, Command-C for copy, and Command-V for paste. When you cut or copy a headline, the entire selected headline and all of its subheads are moved to the Clipboard.

The Extra menu offers Search, Sort, and Status. Search gives you the option to search, continue, cancel, replace, or repeat the last operation. Sort alphabetizes an outline

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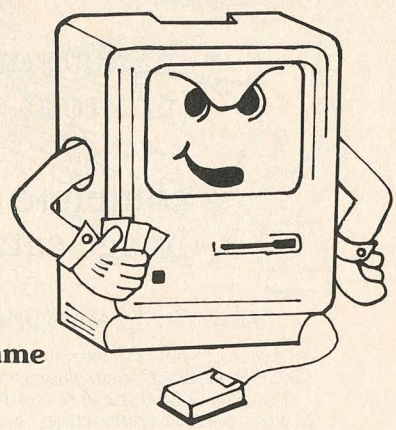

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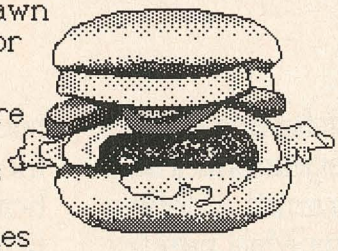

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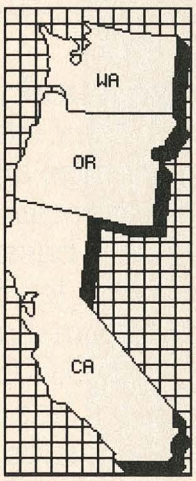

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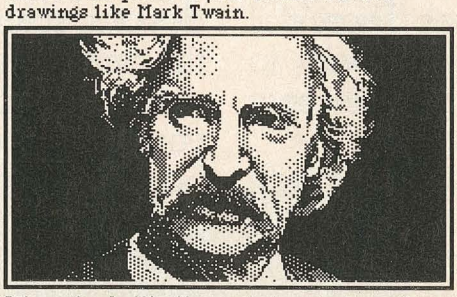

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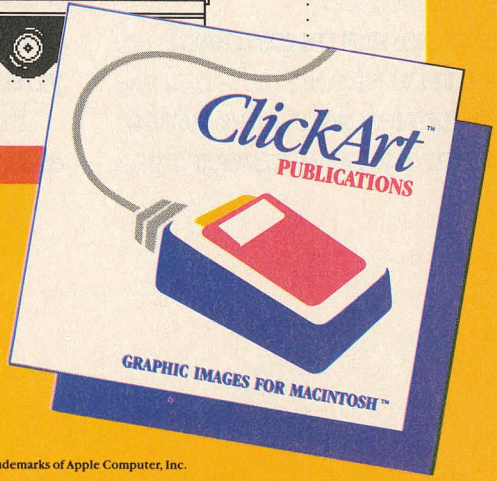

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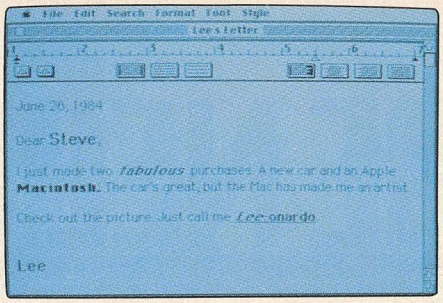

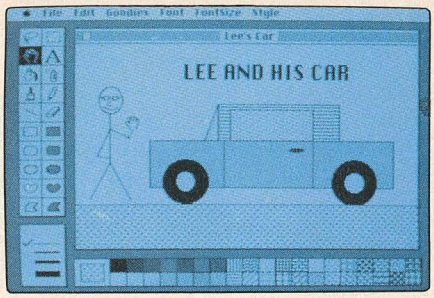

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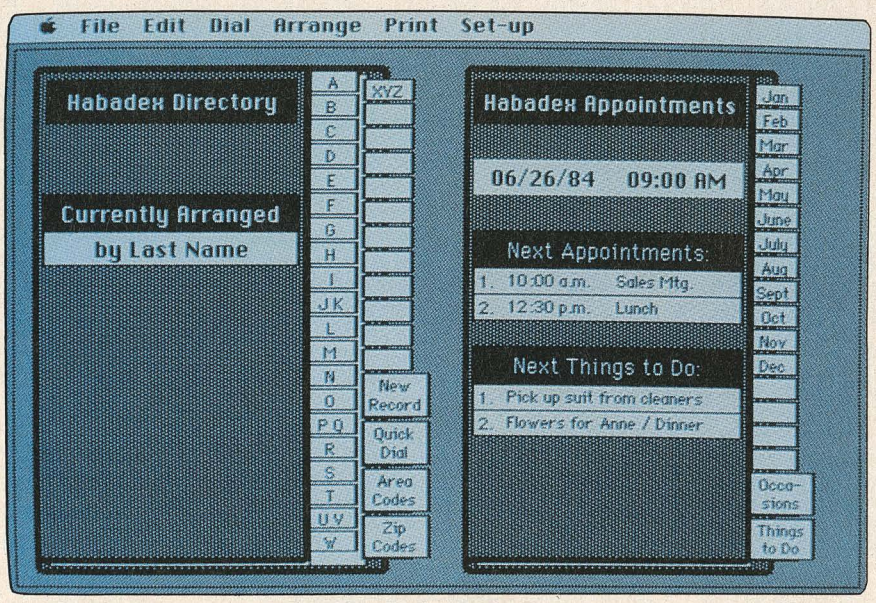

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alphanumerically, ignoring caps. Status gives you the name of the current file, the name of the disk, the amount of free space on disk, and the percentage of space remaining for expanded headlines, total headlines, text, and Clipboard.

The FontSize menu has two options, nine-point and twelve-point. Twelve-point is the default size, and it does have some problems. Twelve-point gives you eighteen lines and sixty-eight characters in the outline window. When twelve-point text is being printed on normal paper, every character beyond the seventy-fifth character is lost; using the wide "sideways" paper option loses characters beyond the ninety-second position.

Nine-point gives you twenty-five lines and eighty-two characters of text in the window and allows you to print 102 columns on normal paper or 122 columns using the wide option. Of course, nine-point type is more difficult to read.

Using ThinkTank with Other Software and Hardware

Apple designed the Macintosh to integrate easily with other products; however, not all software or hardware manufacturers have closely followed the Apple guidelines.

ThinkTank's cut-and-paste method can be used with almost all software that accepts freeform text from the Clipboard, such as *MacWrite*, *Word*, *MacTerminal*, and *MacTEP*. The only problem is having your other application and *ThinkTank* on separate disks, which means that a number of disk swaps are required. The cut-and-paste method does not work very well with MS-Basic, MacBasic, MacPascal, or other programming languages because the leader characters must be removed.

ThinkTank works best in conjunction with *MacWrite*. Once your outline is in *MacWrite*, every line of text is a separate paragraph. You may edit it as you please. One word of warning: The outline for this article used 10 percent of the space available to *ThinkTank*, yet it used almost 50 percent of the space available to *MacWrite*.

Once you use *ThinkTank* with the external disk drive, you'll be hooked. Since you don't have to worry about space for documents, you can put *MacWrite* on the *ThinkTank* disk. The only minor inconvenience is that *ThinkTank* must be run from the internal drive.

ThinkTank is copy-protected. You may copy it to another disk, but the program will only run on the original disk. If you lock (write-protect) the program disk, you will get errors when you try to print anything with *ThinkTank*.

ThinkTank is provided on a bootable disk with Finder 1.1. In addition to the *ThinkTank* application, the disk contains a folder of sample outlines.

If you're planning to purchase a hard disk, *ThinkTank*'s copy-protection could be a problem. Check with the disk manufacturer to see if it has been tested with *ThinkTank*.

The Package

In a world of broken promises for software delivery, Living Videotext bettered their promise and released *ThinkTank* for the Macintosh on June 20, five days ahead of schedule. This version (1.000) is for the current 128K Macintosh, and at $145 it's one of the least expensive software buys for the machine.

When you purchase *ThinkTank*, you receive an 8 1/2-by-10 cardboard box with a slipcover. Inside the box is the *ThinkTank* manual, along with a single 3 1/2-inch disk. The manual is forty-eight pages long and 7 1/2 by 9, just like the *MacPaint* manual.

The manual is excellent. Like the Macintosh manuals that come with the computer, it is divided into six sections. The "Introduction" covers the design philosophy of the Macintosh version of *ThinkTank*, while "Learning *ThinkTank*" presents the most important features of the idea processor. "Using *ThinkTank*" is a step-by-step guide to all the functions of *ThinkTank*. The reference section contains an overview of all functions and menus. A comprehensive error-messages section helps explain and solve any problems you may have with *ThinkTank*. And, most important, the manual has a good, multilevel index.

Also included in the manual are a serialized registration card for you to send in and a telephone support number. After Living Videotext receives your card, you get a free backup copy of the program. Both the original disk and the backup have a limited warranty, covering media for ninety days; if the media fails within one year, the charge for replacement is $25.

ThinkTank's strongest point is its ability to quickly reorganize the outline in whatever way you direct it to. By collapsing out the detail, you can get a broad look at your subject and reorganize the outline from that level. Once you finish the framework, you can go back and start filling in the details.

The program's weakest point is that it is copy-protected. *ThinkTank* is a tool that will often be used with other tools, such as word processors and spreadsheets, and, under these circumstances, the copy-protection gets in the way. At least Living Videotext provides a free backup disk.

In any case, *ThinkTank* is sure to be seen by many people as a must for the Macintosh. It's extremely easy to use, well documented, powerful, and, most important, useful. In fact, it has the potential to add to the value of all the software on your Macintosh, just by making you a more effective planner and organizer.

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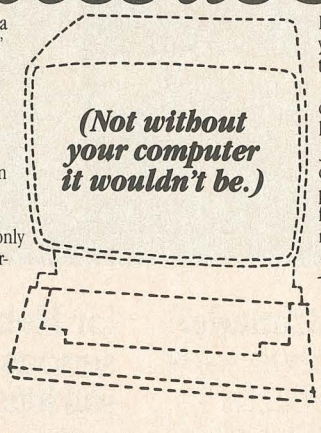

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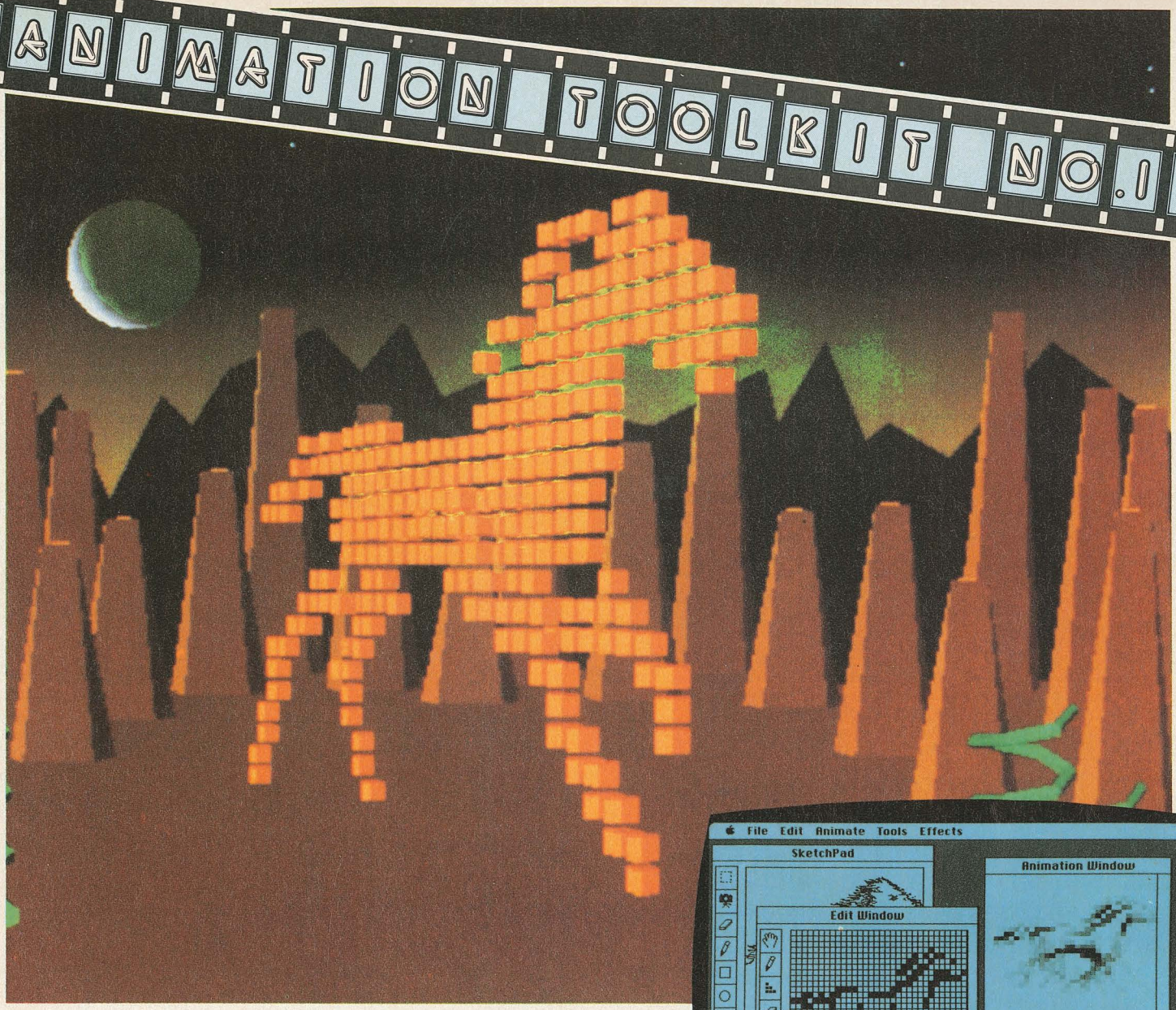

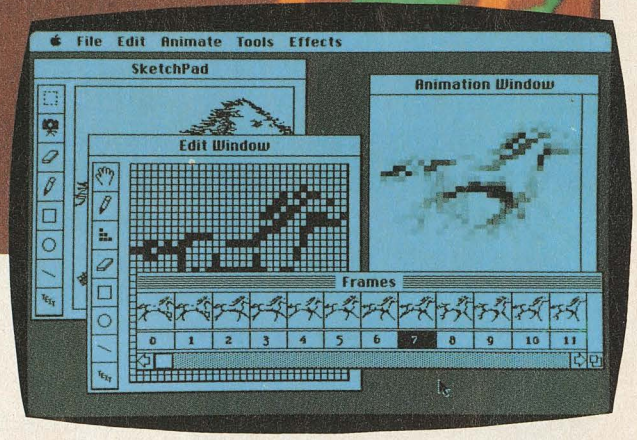

Animation Toolkit 1

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With Animation Toolkit 1 from Ann Arbor Softworks, anyone can easily create, edit, and animate films entirely on their Macintosh computer. Everything happens in real-time, unfolding on the screen right in front of you. An entirely new world of moving images becomes as easy as 'point and click'.

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Finally all the individual scenes are shot, all the film clips are assembled in the editing room, waiting to be combined into a finished film. Start with your opening clip, play it back in slow motion, perhaps decide to edit out a few frames. Splice in another clip, play it twice, then dissolve to a third. Wait, let's try it another way. No problem. You have total control over the content and format of the film. Even jump back on location and reshoot a particular scene again.

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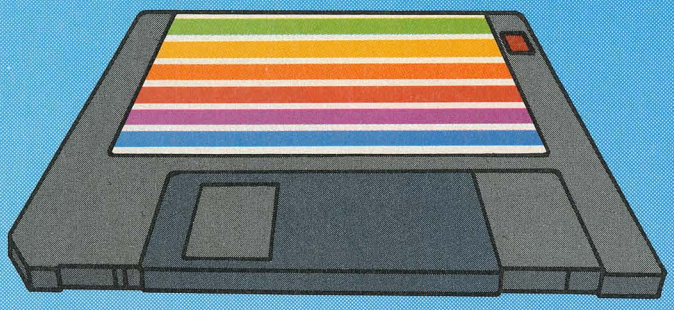

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PFS:File and PFS:Report

Software Publishing has announced the release of Macintosh versions of two of its bestselling Apple IIe programs. Both Macintosh programs are not strict translations and both employ the Macintosh user interface. *PFS:File* is an unstructured database that lets users control data. It handles up to thirty-two pages (screens) of information in each record.

PFS:Report interfaces with *PFS:File* and sorts, calculates, totals, formats, and prints presentation-quality columnar reports. $125 each; both *PFS:File* and *PFS:Report*, $195. Software Publishing, 1901 Landings Drive, Mountain View, CA 94043; (415) 962-8910.

Xyphus

Xyphus is a hybrid strategy and fantasy role-playing game that provides a player with a party of four characters who can each move independently. The game consists of six scenarios, each of which has different monsters, magic spells, and weapons. A scenario may take from two to twelve hours to complete. $39.95. Penguin Software, Box 311, Geneva, IL 60134; (312) 232-1984.

Macintosh Graphic Adventure

Legacy is a graphic adventure that uses two-thirds of the Macintosh screen for graphics and supports the Macintosh user interfaces. The story casts the player as a young apprentice magician whose goal is to reach a forbidden castle. *Legacy*'s parser accepts full sentences. The game comes on two disks. $39.95. Challenger Software, 18350 Kedzie Avenue, Homewood, IL 60430; (312) 957-3475.

Macintosh Relational Database

1stBase is a relational database system that offers multiple-file capability, user-defined file formats, automatic generation of data-entry screens, use of Macintosh editing features, and nested sorts of up to ten keys. *1stBase* enables users to create personnel files, prospect lists, columnar reports, and mailing labels. A single file can be as large as a disk and can hold up to fifty fields per record. $195. Desktop Software, 228 Alexander Street, Box CN-5287, Princeton, NJ 08540; (609) 924-7111.

Small Printer Stand

Mini-Printer Stand is usable for desktop printers that weigh less than thirty pounds. The stand is constructed of smoke-colored high-impact acrylic. Paper feeds from below the stand to enable easy refolding. $36. Omnium Corporation, 210 North Second Street, Box 186, Stillwater, MN 55082; (612) 430-2060.

Home Finance Software

Dollars and Sense for the Macintosh allows users to keep track of twelve checking accounts and set up as many as 120 record-keeping categories of five different types: assets, liabilities, expenses, income, and checking. Users can then assign budgets to the records, enter as many as 2,000 transactions per disk, balance their checking accounts, automatically issue preprinted checks, and produce a variety of reports and graphs including pie and bar charts that can be displayed on the screen or printed. The program is a Macintosh version of the bestselling Apple IIe and IBM PC programs of the same name, yet it employs the Macintosh user interface. $149.95. Tronix/Monogram, 8295 South La Cienega Boulevard, Inglewood, CA 90301; (213) 215-0529.

Macintosh Printer Driver

ProPrint is a printer driver program that will output Macintosh text directly to letter-quality printers. Without printer cable, $74; with printer cable, $99. Creighton Development, 4931 Birch Street, Newport Beach, CA 92660; (714) 476-1973.

Macintosh Database

DB Master for the Macintosh features on-screen prompts, computed fields, ascending and descending sorts, a built-in report generator with ten sort levels, report calculations, and a browse capability to view numerous records on the screen at the same time. *DB Master* can use up to twenty selection criteria by which it makes a highly defined search of information in a file and can enable you to design and reuse up to 255 different report formats for each file. More than one file can be stored on each disk, and the program can keep track of up to forty-four disks. $195. Stoneware, 50 Belvedere Street, San Rafael, CA 94901; (415) 454-6500.

Think Educational Software

Mind Over Mac consists of five games on one disk. The games include MasterCode, a timed game in which the player tries to break a secret code; Destroyer, a battleship strategy game for two players; Third Dimension, a $4 \times 4 \times 4$ ticktacktoe game for two players; On-the-Contrary, a perceptual memory test for up to four players; and Trivial Intrigue, a trivia

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game for up to eight players. $49.

MacEdge is designed to teach reading and math skills to those at the primary to junior high school levels. The math section of the program begins on the primary level with addition and subtraction of objects, thus leading up to the use of numerals; the intermediate level provides practice with multiplication and division; and the advanced level encourages kids to compute with larger numbers. The reading portion of the disk contains practice in the recognition of compound words and contractions on the primary level; exercises in identifying antonyms and synonyms are included on the more advanced levels. $49. Think Educational Software, 16 Market Street, Potsdam, NY 13676; (315) 265-5636.

Mac Speech Synthesizer Software

Smoothtalker enables a Macintosh, without any additional hardware, to convert *MacWrite* text or other keyboard input into computerized speech. Speech is amplified through Macintosh's built-in speaker. The software also lets programmers include Macintosh speech in their Basic or Pascal programs. $150. A forty-five-second Touch-Tone telephone demonstration is available twenty-four hours a day by calling (714) 536-0086, extension 222. First Byte, 2845 Temple Avenue, Long Beach, CA 90806; (213) 595-7006.

Macintosh C Compilers

The Macintosh C Development System is available in two versions, a personal system called Aztec C68K-p and a commercial system called Aztec C68K-c. The Aztec C68K-p system consists of a full C compiler, a 68000 relocating macro assembler, a full Unix system library, an editor, and a shell command environment. The commercial compiler, Aztec C68K-c, includes all of the features of the Aztec C68K-p system plus support for the full Macintosh Toolbox, including windows, an overlay linkage editor, and dynamically relocatable code with unlimited code size. Both compilers are compatible with other compilers produced by Manx Software Systems. Aztec C68K-p, $199; Aztec C68K-c, $500. Manx Software Systems, Box 55, Shrewsbury, NJ 07701; (201) 780-4004.

PCBasic

PCBasic for the Lisa is a compiler that allows you to run IBM PC programs on your Lisa. The compiler is mostly compatible with the BasicA compiler for the IBM PC and allows a user to generate 68000 assembler to link to Pascal programs, link to 68000 assembler programs, and link to QuickDraw procedures. $250 for protected compiler, one machine only; $750 for a runtime license that will allow you to include the compiler in any products you develop for sale. Pterodactyl Software, 200 Bolinas Road, Fairfax, CA 94930; (415) 485-0714.

Macintosh Utility

PaintMover enables you to create objects and menus using *MacPaint* and then convert those files into Microsoft Basic to display and control. The converted files can be loaded directly into an array by a Basic program. $29.95. Macinsoft, Box 27583, San Diego, CA 92128; (619) 745-6084.

Bulletin Board Log Book

The BBS Log Book helps you keep track of your phone calls and related information when accessing bulletin board systems and other on-line services. The BBS Log Book will keep track of your password, time on, time off, access numbers, and dates. It also includes room for notes and upload/download information. Seventy-five to eighty pages; $5.95. Atmospheres, 1207 Eighth Avenue, Brooklyn, NY 11215; (212) 788-6799.

Software Potpourri

Microcomputer Service Corporation has introduced thirty-one Macintosh programs that are written in Microsoft Basic and appear on one disk. The programs include a home database, checkbook manager, hex-decimal converter, interest table, math quiz, metric converter, hangman, algebra, prime factors, recipe box, Othello, prime number generator, slot machine, French quiz, craps/dice game, tick-tacktoe, quadratic roots table, word search, and a shape-maker tool. $29.95. Microcomputer Service Corporation, 8208 North University, Peoria, IL 61615; (309) 692-7786.

Artist on a Disk

Dreams of the Phoenix will produce six new volumes of their electronic clip art *Cut 'n' Paste* each year. Each volume will have a specific subject, such as people, symbols, landscapes, office equipment, or computers. Included with each disk is documentation on how each *Cut 'n' Paste* drawing was designed, along with examples of how it can be used in your work. Each volume, $39.95; one-year subscription, $199.

Artists interested in creating clip art for the *Cut 'n' Paste* volumes can send their work on disk to Dreams of the Phoenix. For accepted entries, the company will pay between $10 and $50 per page or font depending on the quality and complexity of the work. Dreams of the Phoenix, Box 10273, Jacksonville, FL 32247; (904) 396-6953.

Macintosh Communications Software

BLAST is an asynchronous communications package that enables any two computers on which it has been implemented to talk to each other through asynchronous ports using either a hard-wired link or an asynchronous modem. The program allows data transmission at speeds of up to 19200 baud. $250. Communications Research Group, 8939 Jefferson Highway, Baton Rouge, LA 70809; (504) 923-0888.

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Finally,
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Legacy

An actual Macintosh image of Arkimar, one of the Great Wizards of the Universe.

Dangerous adventure awaits the player of **Legacy**. As a young magician, you must fulfill the wish of Arkimar, one of the thirteen Great Wizards of the Universe. He has assigned you the task of finding the fabled Drab Castle, located deep in the Sechryll Forest. Beware of the forces that dwell in the forest, for they make your path a dangerous and difficult one. Only a cunning, skillful magician will be able to complete the task.

Several elements of Legacy's design make it especially suited for a machine as unique as the Macintosh. **Legacy** features the most complex, realistic graphics ever put into an adventure game. In fact, they require nearly two-thirds of the Macintosh screen. This, along with detailed room descriptions and the ability to accept full sentences as commands makes **Legacy** a fantastic adventure in a magical yet mysterious setting.

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FILEVISION

The Database Worth a Thousand Words

by Allen Munro

The Macintosh's computational power and graphics capabilities make possible new kinds of software not available on other computers. Mac users are being given the ability to manipulate information, especially nonverbal information, more directly than is possible with other computers. One of the first examples of such innovation is *Filevision*, from Telos Software Products, a Santa Monica, California, software development firm.

Filevision is a visual filing system that lets you tie database entries to objects in a Macintosh drawing. It allows you to store data in files that refer to pictures you create. Put another way, with *Filevision* you can draw pictures composed of objects that have data associated with them.

The documents you create with *Filevision* are called drawing files. These pictorial databases include both pictures and the data forms that describe the objects in the pictures. Through the *Filevision* menu options, you can pictorially highlight objects in your pictures that have certain data characteristics. Or you can print out either complete or selective lists of data about drawing file objects. If your stored data includes names and addresses, you can even do mailing labels with *Filevision*.

Filevision drawing files can be a very useful way to enter data that you'd like to arrange topographically—as though it were part of a map. If you have a collection of objects stored in a particular arrangement, you can use this program to record both where the objects are located and their alphanumeric data characteristics. For example, *Filevision* could store a management chart together with facts about the departments represented and their managers.

This article is adapted from *Mac Work! Using the Apple Macintosh*, Allen Munro's forthcoming book on Macintosh applications, and appears here with the permission of the publisher, Scott Foresman and Company.

A Summer Olympics Drawing File

In figure 1, we see a map of the Los Angeles area that includes objects of four types: background objects (such as coastline and mountains), freeways, cities, and Olympic sites. Unlike *MacPaint*, *Filevision* recognizes each object depicted in this scene as an object. If you point to an object and click, its name appears just below the window containing the drawing. This action puts a different *Filevision* drawing file on the screen depicting a close-up of the area of Los Angeles in which the Olympic swimming competition was held (figure 2). A rectangular object has been selected by pointing and clicking, and it shows up with nine small white rectangular "handles." A graphic object's handles let the user reposition or stretch the object using the mouse, just as is possible in *MacDraw*. The text at the bottom of the screen informs us that the object is a sports facility, the natatorium.

Each object in a drawing file has a set of alphanumeric data associated with it. The user

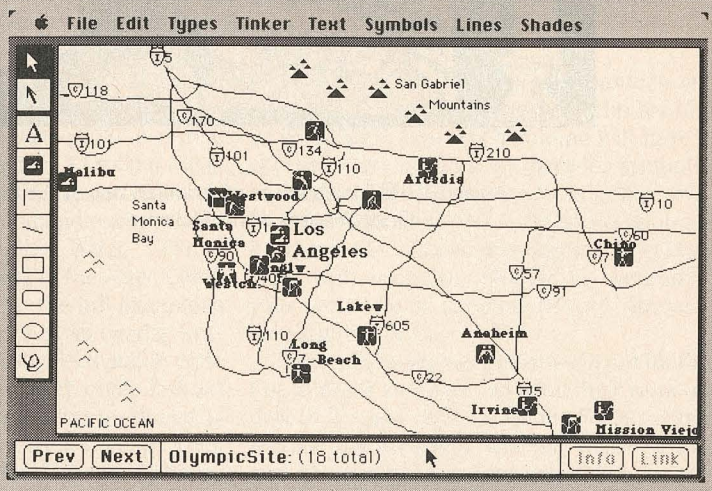

Figure 1. A Filevision Olympic map.

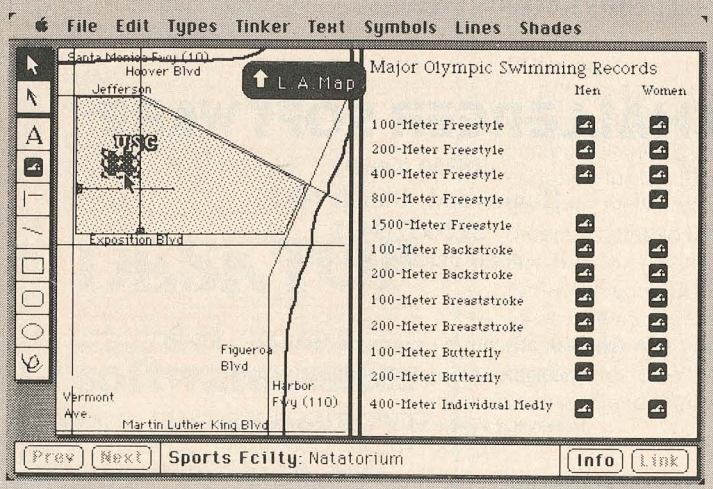

Figure 2. A close-up of the Olympic swimming site.

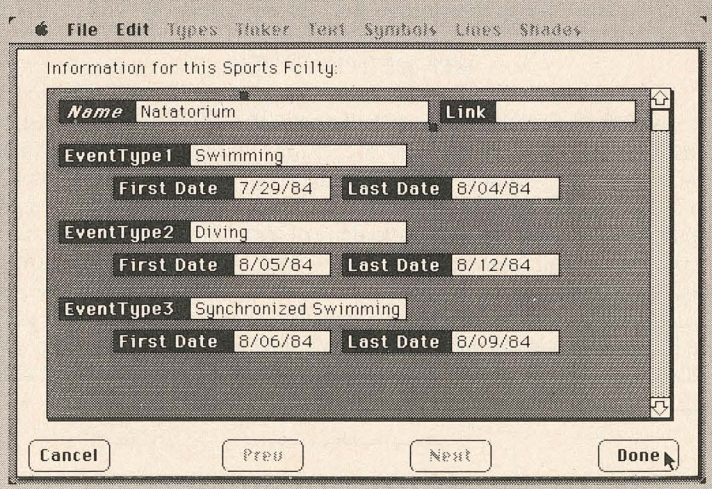

Figure 3. The information form for the natatorium.

can access this data by clicking the Info button on the bottom of the screen. Each type of object has its own standard information form that gives the user access to information about objects of that type. If the user clicks the Info button for the natatorium, for example, the form in figure 3 appears showing that three types of events took place at the facility: swimming, diving, and synchronized swimming.

Like *MacDraw*, *Filevision* is an object-oriented graphics composition application. Unlike *MacDraw*, it is also an information-filing system. *Filevision* allows you to create and edit both the drawings and their associated data forms.

Consider a few of the capabilities *Filevision* provides for information browsers—those who use existing drawing files to get information. Eight menus, shown in figure 4, give access to a huge set of information manipulation commands; two menus of special interest to information browsers are the Tinker and File menus. The File menu offers a number of selective print options, while the Tinker menu provides for temporary changes in the appearance of a drawing to bring out some aspect of the data. The Tinker menu gives browsers a kind of control over object-oriented displays that no other application has yet provided.

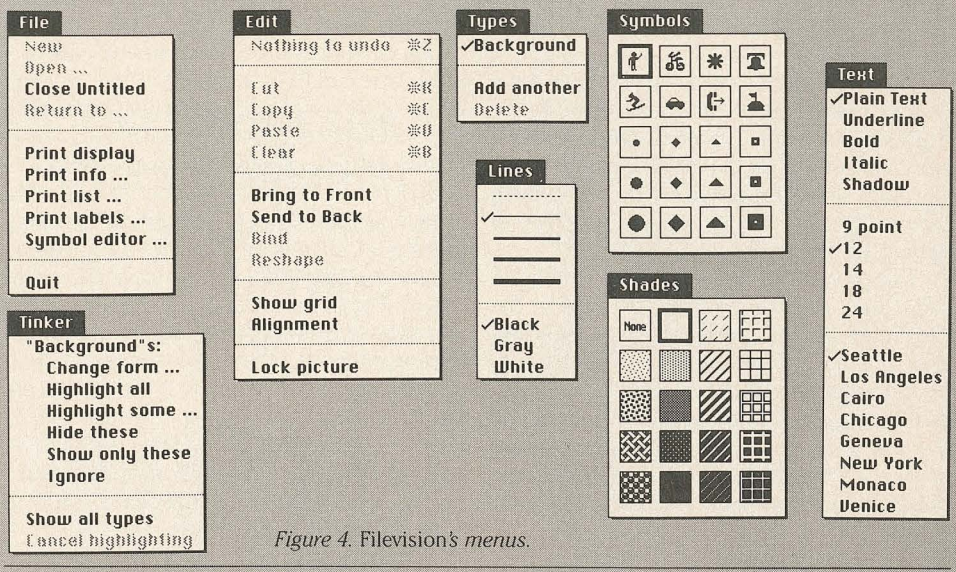

Figure 4. Filevision's *menus.*

Manipulating the Display

All objects of a particular type in a drawing can be hidden. To do this in our example, you first make that type the currently selected object type, either by pointing to an object of that type and clicking or by choosing it from the Types menu. Then you simply choose the Hide These option from the Tinker menu, and all the cities shown on the drawing will disappear (figures 5 and 6). Naturally, a Show Only These option is also available to make the objects that represent cities reappear in the drawing.

Control over the appearance of objects is not limited to making all the objects of a particular type appear or disappear. Objects can also be highlighted. Highlighting is a process that "grays out" unselected objects in a drawing and adds special shadowing to the objects that are highlighted. The result is a display in which the highlighted objects stand out. You have the option to highlight all the objects of a type, but a much more useful feature is the ability to highlight only those objects that have certain data characteristics that you specify.

If you choose the Highlight Some option when the "City" type is selected, you can specify the constraints you want to place on the highlighted objects. A special form will fill the screen asking you to describe the conditions for highlighting a city (figure 7). In the example shown here, only those cities with two or more Olympic sites are to be highlighted. As soon as the user clicks the Done button on this form, the drawing will be redisplayed, but with almost all the objects grayed out (figure 8). According to the data stored with this drawing file, only the cities of Los Angeles and Mission Viejo have more than one Olympic

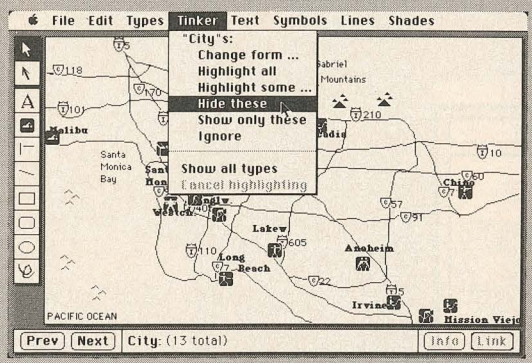

Figure 5. Selecting Hide These with "City" as the current type.

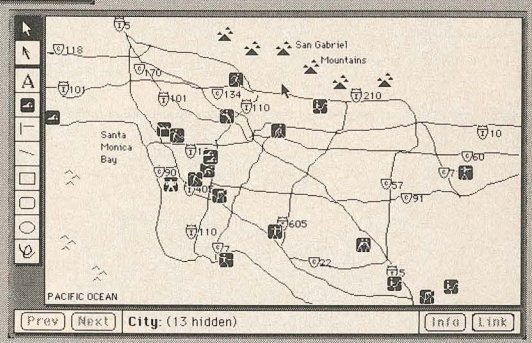

Figure 6. The same drawing with cities hidden.

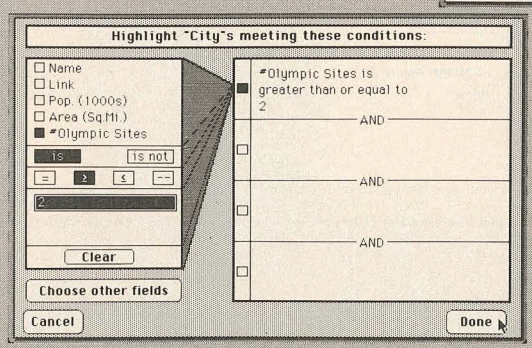

Figure 7. Filling out the Highlight Some "conditions" form.

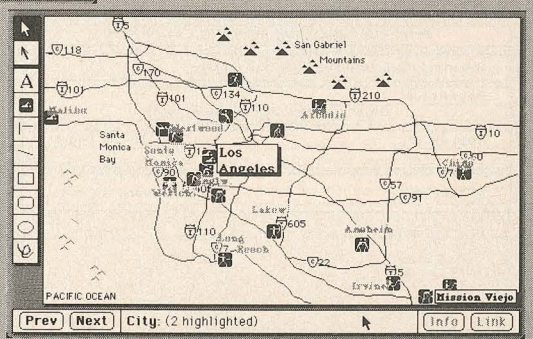

Figure 8. Los Angeles and Mission Viejo highlighted.

site, so only those two objects will be highlighted.

The Highlight Some option permits more complex statements of conditions. If, for example, you wanted to know which Olympic sites were in use throughout the period of the Olympics, you could ask to see those for which the first day was July 29 and the last day was August 12 (figure 9).

The process of filling out a "conditions" form does not require that you type in the conditions phrases (such as "First Day is less than or equal to") seen in the condition boxes on the right. These English phrases are composed naturally by clicking the selections in the box to the left. The only items you have to type are the limiting values that the condition refers to, such as "8/12/84."

Printing Lists

Information stored about the objects of a given type can be printed out from *Filevision* by using the print options available from the File menu. Like most other database manipulation systems, *Filevision* stores data in records. Each record has a number of fields, the predefined parts of a record. The list-printing options let you decide which fields should be printed in a list, with one line printed for each record. The list-formatting page (figure 10) lets you choose which of a record's fields should appear in the list, where to position each field on the line, and how much space to allocate for it. You can even independently specify whether the material from the field should be right- or left-justified or centered in its column.

The list-formatting options also let you decide what data field the printing order should be based on. In this example (figure 11), the user chose to have Olympic sites printed based on the order of their first day of use. The field that determines the order of printing does not have to be the field in the first column of the printout.

1984 Summer Olympic Sites

Name	Event Type	First	Last Day
Loyola Marymount	Weight Lifting	7/29/84	8/08/84
Forum	Basketball	7/29/84	8/11/84
Cal State Dominguez Hills	Cycling	7/29/84	8/05/84
Mission Viejo	Cycling	7/29/84	8/05/84
Corto de Caza	Modern Pentathalon	7/29/84	8/01/84
Santa Anita Park	Equestrian	7/29/84	8/12/84
RoseBowl	Football (Soccer)	7/29/84	8/11/84
UCLA	Gymnastics, Tennis	7/29/84	8/11/84
East Los Angeles College	Hockey	7/29/84	8/11/84
University of Southern	Swimming	7/29/84	8/04/84
Prado Recreation Area	Shooting	7/29/84	8/04/84
Fairbanks Ranch	Equestrian	7/29/84	8/12/84
Anaheim Convention Center	Wrestling	7/30/84	8/08/84
Dodger Stadium	Baseball	7/31/84	8/07/84
Long Beach Convention	Fencing	8/01/84	8/11/84
Pepperdine University	Water Polo	8/01/84	8/10/84
L. A. Memorial Colliseum	Track and Field	8/03/84	8/12/84
El Dorado Park	Archery	8/08/84	8/11/84

Figure 11. The printed list of Olympic sites.

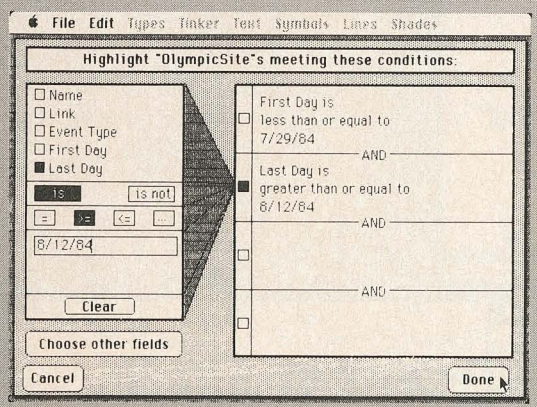

Figure 9. A more complex "conditions" form.

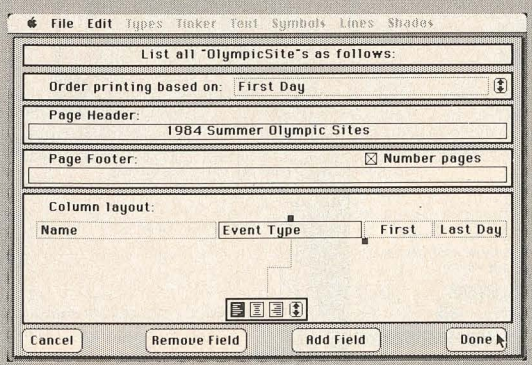

Figure 10. The list-formatting page.

Filevision does not limit you to printing lists in which you can have only one line per record. You can use Print Info to print all the information about the objects of a type. A formatting page similar to the one used for printing lists lets you choose options that control the printout (figure 12). Here a set of Olympic swimming records is to be printed, in an order based on the record time for each of the events.

Other printing options include printing the display and printing sets of labels based on data from a drawing file.

Waiting for Macintosh

Filevision was designed and programmed by Matt Jacobs, David Murray, and Howard Metcalfe of Telos. The germ of the concept that led to *Filevision* was an Apple II program called *Telography* that the Telos staff worked on in 1983. Prototype versions of *Telography* convinced Telos that personal computer technology could not yet deliver their product. Then they saw the Macintosh in early 1984 and recognized the perfect hardware match for their software.

The Mac's characteristics led the Telos team to a completely new design.

Since *Filevision* is a new kind of software not previously available on microcomputers, it's likely that people will come up with uses for it that its developers never imagined. Here are some of the uses the developers *have* thought of. The Los Angeles Olympics drawing files that illustrate this article are an example of an "intelligent maps" application. Of course, these maps aren't actually intelligent, but they have capabilities that let the user get a lot more out of them than is possible with ordinary maps.

Other possibilities for *Filevision* include "intelligent illustrations." A drawing of the parts of the human eye, for example, could employ data forms that let students formulate their own questions about how the depicted objects are interrelated and then get the answers in both pictorial and verbal forms. Artistically

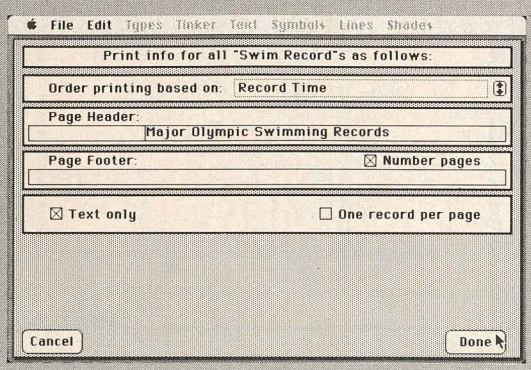

Figure 12. Formatting options for Print Info.

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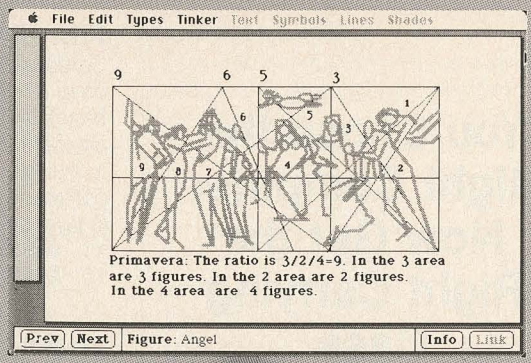

Figure 13. Botticelli's Primavera.

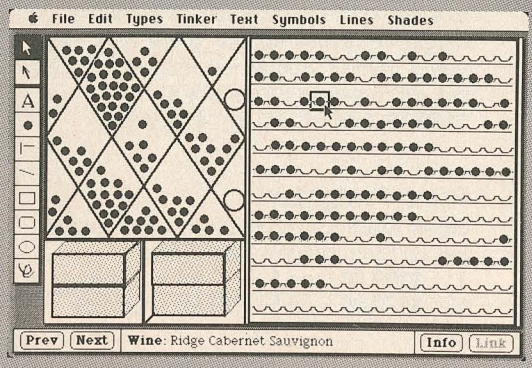

Figure 14. A wine collection.

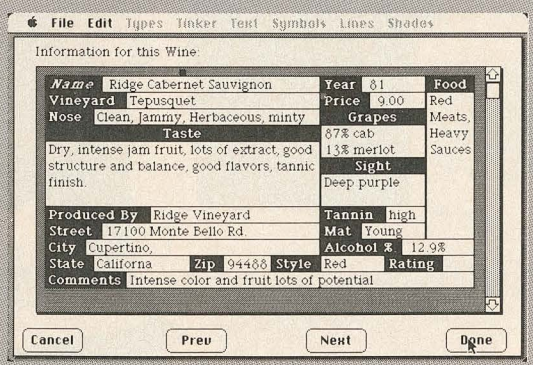

Figure 15. The wine data form.

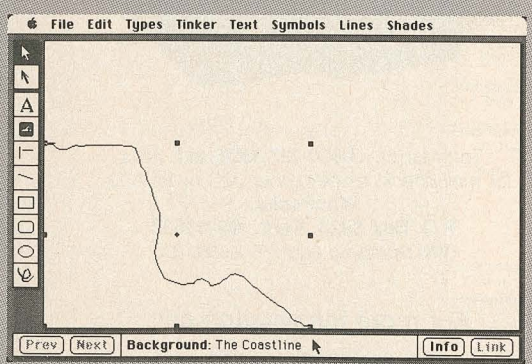

Figure 16. The coastline.

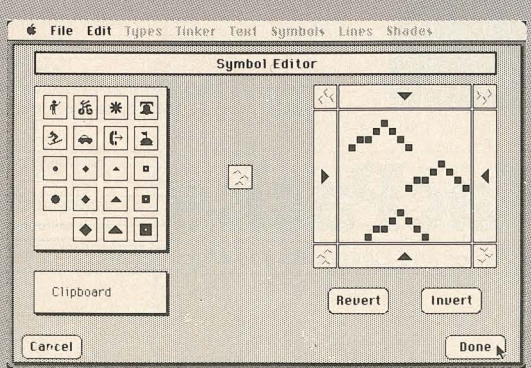

Figure 17. The finished "waves" symbol.

inclined users can create striking images as technical illustrations. The components of these illustrations are objects for which *Filevision* can retrieve the data on command.

Even art analysis can be carried out with the assistance of *Filevision*. A sketch of an artistic work can be stored as a drawing file, together with whatever data is desired about the elements of the artistic work (figure 13).

On a more mundane level, many Macintosh owners may choose to use *Filevision* to produce drawing files that relate to spatially organized aspects of their ordinary lives. A map of one's apartment may be an aid to organizing the placement of furniture. You've probably been admonished to keep a list of your valuables. With *Filevision* you can keep a map of your living space in which each valuable has its own data form, filled with all the information that the police and the insurance companies would like you to have on hand. Or, if you are a collector, you might choose to keep a drawing file that not only stores relevant data about each item in your collection, be it coins or rare wines, but also shows where each item is located (figures 14 and 15).

Building a Drawing File

The *Filevision* release disk contains a very nice map of the United States as a sample document and a simple tour through the program. Most users, of course, will want to create their own drawings, populated with objects of types of their own design. These types would then have data forms of the users' own devising. To see how it's done, follow along with the construction of the Los Angeles Olympics drawing file.

First, I opened the *Filevision* icon and was presented with an empty drawing file. The default type at this point is always called "Background." I wanted to enter a few background elements for the Los Angeles area—at least the coastline and the mountains. From the palette of drawing tools at the left, I chose the last one, the freehand line tool. I used it to sketch out the Los Angeles area coastline. As soon as I released the mouse button, a set of nine "handles" appeared (figure 16). (These little solid rectangles—and one diamond shape—let the user move an object or change its shape.)

I wanted to add to this background object several elements made with other tools on the palette, such as the text tool. I also wanted to make several little waves in the area of the Pacific Ocean. Rather than try to sketch the waves in freehand, I decided to make a special wave symbol that I could drop wherever I wanted. I called up the *Filevision* symbol editor from the File menu, chose a symbol I didn't plan on using, and used Clear to erase it. (The symbol editor will remind you of Fat Bits in *MacPaint*. It lets the *Filevision* user develop up to twenty special symbols or icons for use in a drawing. Each drawing can have its own unique set of twenty special symbols, of course.)

After I'd finished sketching my "waves" symbol (figure 17), I clicked the Done button

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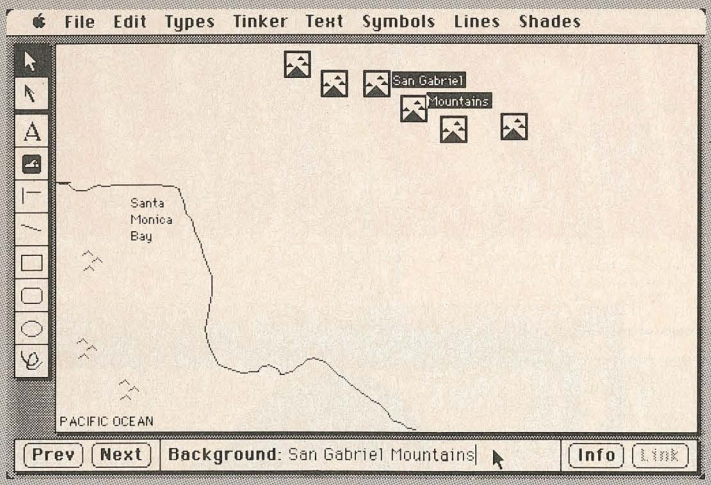

Figure 18. A drawing with two background objects.

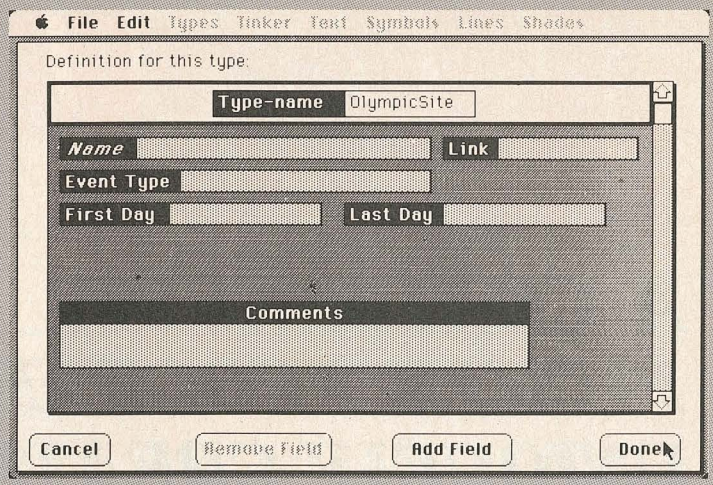

Figure 20. The Olympic site definition form.

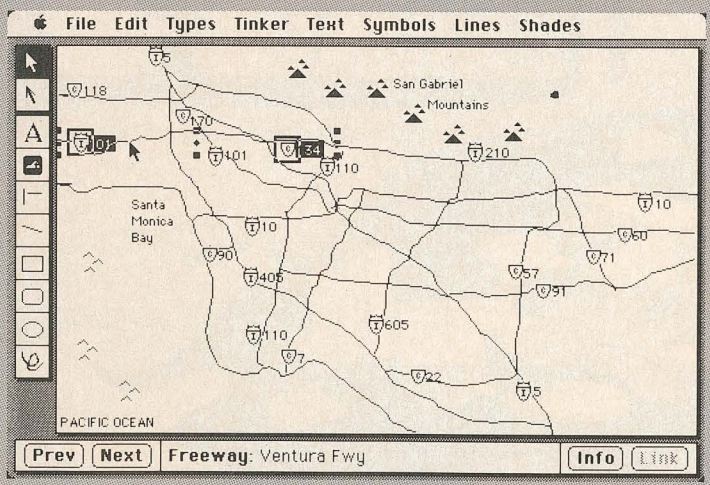

Figure 19. The freeway objects entered.

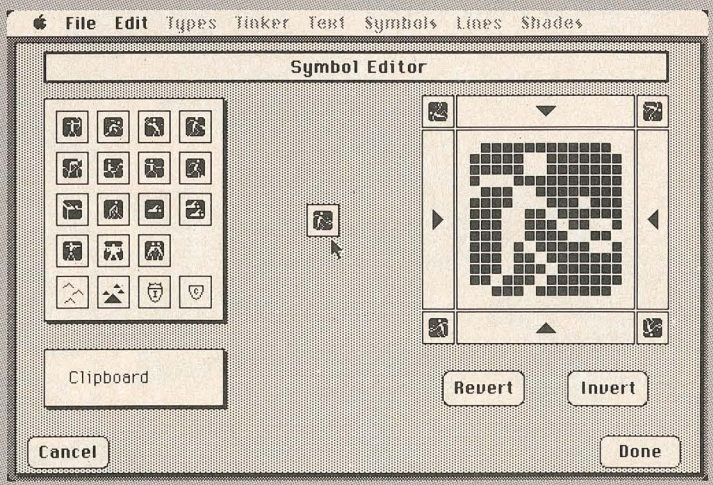

Figure 21. The Olympic sports symbols.

to get back to the drawing page.

There I chose the symbol tool, the fourth item on the palette. I held down the shift key as I selected the symbol tool, thereby telling *Filevision* that I planned to add an element to the current object (the coastline), rather than add a new object. (The symbol tool leaves a copy of the current symbol shape wherever one clicks in the drawing.) After adding a few sets of waves to that first background element, I held down the shift key again while selecting the text tool, the large capital A. I entered the names "Pacific Ocean" and "Santa Monica Bay."

Because I chose to enter all of these elements as parts of one object, they are all closely linked in the *Filevision* drawing file. When I click on one of them, all are highlighted. Furthermore, since only objects (not elements) can have data forms, there can be only one data form to represent the entire object.

Going back to the symbol editor, I made a new symbol to represent mountains, then added a new object consisting of several elements from that symbol and the words "San Gabriel Mountains" (figure 18).

My next step was to pull down the Types menu to add another type. *Filevision* presented me with a type definition form. I called the new type "Freeway" and gave it five data fields. (Actually, two of the fields, Name and Link, are always automatically supplied by *Filevision* when you create a new object type.) I provided for up to two freeway numbers because of the strange practice in Los Angeles of giving freeways names that are independent of their numbers. (The Hollywood Freeway includes portions of Highways 101 and 170, and the Ventura Freeway consists of the rest of 101 and parts of 134.) A third number tells how many Olympic sites are immediately accessible from the freeway.

Using the symbol editor, I created two new symbols to represent interstate highway and California highway symbols. Each freeway in the drawing consisted of a number of elements, including one or more freehand line segments, one or more highway symbols, and one or more text elements positioned right after a highway symbol. (In figure 19, clicking on the line that represents the Ventura Freeway has resulted in the line acquiring handles and in the objects' two symbols and two text elements becoming highlighted.)

The next step in preparing my Olympics drawing file was to create a new object type, the Olympic site. The data fields associated with an Olympic site would be its name, its link, its event type, the first and last day of its use during the Olympics, and a comment field (figure 20). To represent the sites, I devised symbols that represented the different sporting events that would take place at each. I used the symbol editor to construct these sixteen new symbols, representing sports from archery to tennis (figure 21). (In case the symbols seem a bit cryptic, here they are in order:

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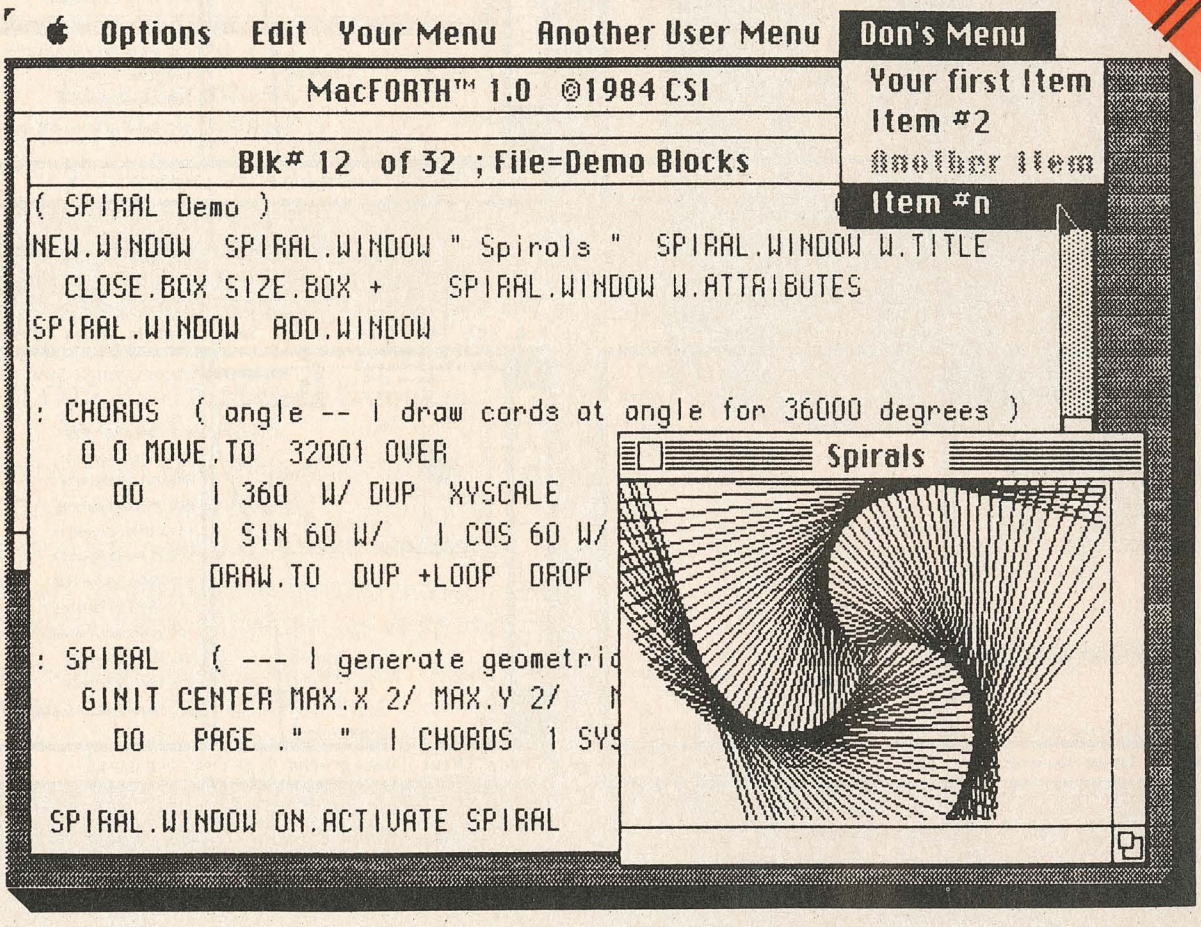

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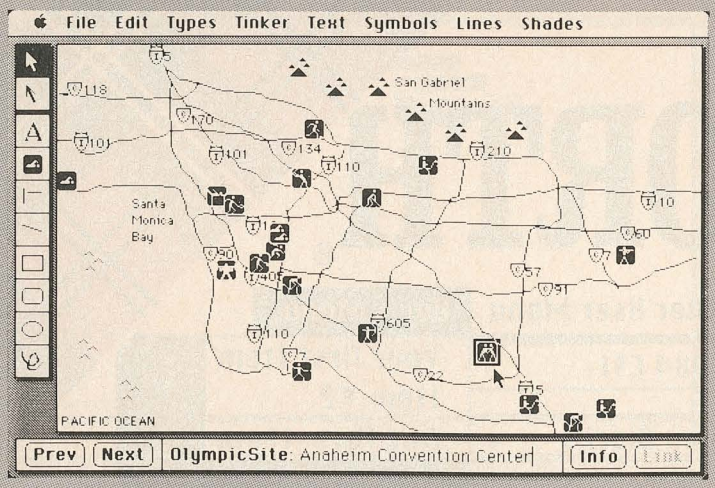

Figure 22. The drawing file with Olympic sites.

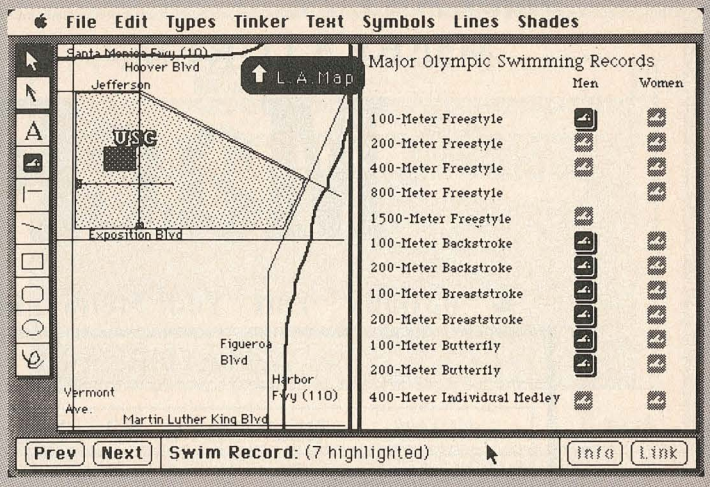

Figure 24. Highlighted Olympic swimming records.

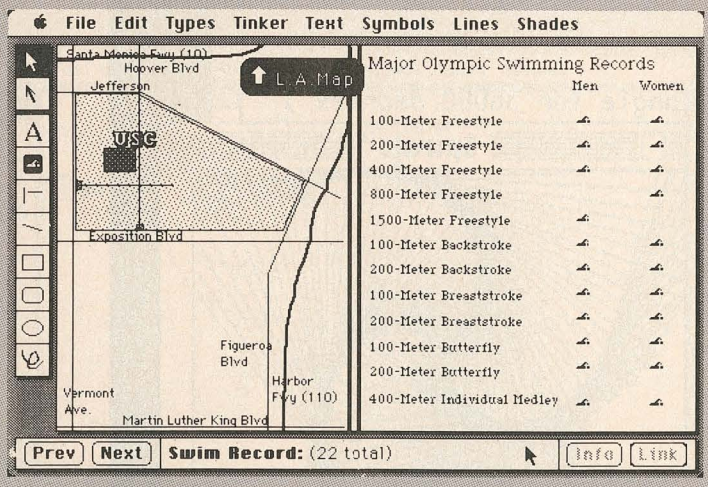

Figure 23. The USC Olympic site drawing file.

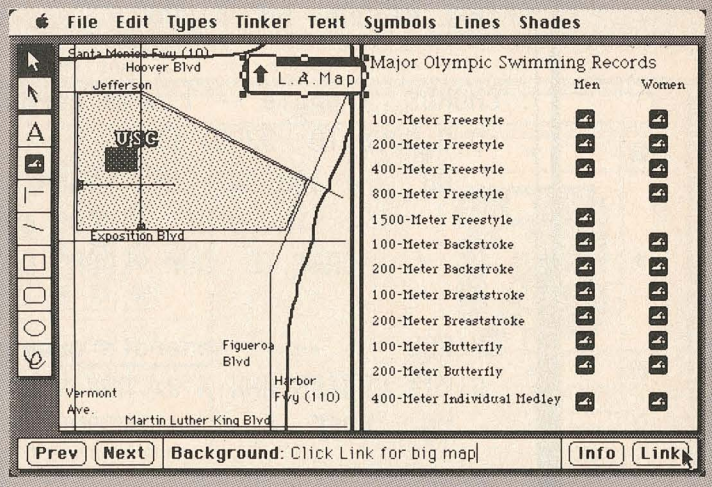

Figure 25. A link back to the Los Angeles Olympics map.

row 1—archery, track and field, baseball, basketball; row 2—cycling, equestrian, fencing, football (soccer); row 3—gymnastics, field hockey, water polo, swimming; row 4—shooting, weightlifting, wrestling, tennis.)

The next step was to add all the Olympic sites to the drawing file, along with the information about each one (figure 22). By clicking on any object in the drawing, one can learn the type of the object and its name. By clicking on the symbol of the wrestlers, we learn that it represents the Anaheim Convention Center. (To get more information about an object, or to edit information, you simply click the Info button.)

Once a drawing file has been created and the data entered, it can be locked and given to others who need to use the data but who don't have to edit it. Such users can still tinker with the drawing file, exploring the significance of the stored data.

In addition, drawing files can be linked to each other. Each site in the Olympic map drawing file can have a link to a more detailed local map for that site. The drawing file for the University of Southern California site, where the Olympic swimming events were held, is a good example (figure 23). This file not only has a map of the USC campus and surrounding area but also a section devoted to previous major Olympic swimming records. Each of the swimming figure symbols is an object with a data form that has information on the current Olympic record for a swimming event.

By first selecting the USC site on the global Olympic map and then choosing to link, the user moves automatically to the new drawing file.

From this new file, it is possible to use the Tinker menu's Highlight Some option to ask a question like "What Olympic swimming records are held by athletes from the United States?" and to get a pictorial response (figure 24). If every Olympic site in the higher-level map has a link to such a drawing file with local street information and Olympic records, then *Filevision* can provide the user with a richly interconnected set of drawing files and data.

Since a user is likely to want to get back to the larger map from such a specific drawing file, it makes sense to provide a link in that direction as well. Since nothing in the USC site drawing file seems to serve as a natural representation for the larger map, I added one. I used the rounded rectangle to make a box and two text elements—one in the Cairo font and one in Geneva—to create a box titled "◂ L.A. Map." I gave this background object the artificial name "Click Link for big map," which serves as an instruction to naive users (figure 25).

Now I can use my Macintosh to explore the geography and records of the Los Angeles Olympic Games, thanks to *Filevision*.

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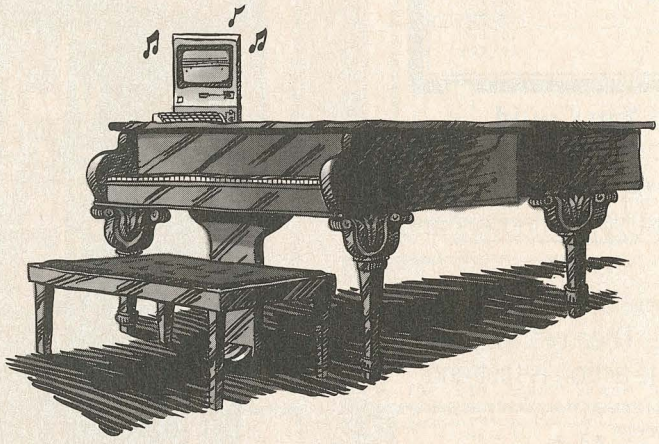

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REVIEWS

Pensate

Pensate for the Macintosh doesn't waste a moment getting your attention—as soon as it's booted, it welcomes the player with a delightfully harmonized "Habanera" from *Carmen*. Continuing to cater to the tastes of the type of player to whom it expects to appeal, it accompanies winning rounds with a bit of the Grand March from *Aida*, losing rounds with a tuneful passage from the Peer Gynt Suite no.1, and the setting of records with—what else?—"Pomp and Circumstance."

The wonderful surprise is that the game lives up to the music.

Available for about a year for Apple IIs, *Pensate* never swept the market like a tidal wave; it just keeps rollin' along, selling at a steady, leisurely pace to those souls wanting a good, challenging, thinking person's game to play of an evening with a glass of good wine and Rachmaninoff sweetening the stereo.

It's apt to find a much swifter market among MacPeople, who are not yet jaded by four years of flash, dazzle, and spit. Actually, in its Macintosh configuration, *Pensate* is just rezzy enough to have all the flash, dazzle, and spit you might want.

But the story behind the pizzazz is the game: *Pensate* is the best abstract strategy game (the category that chess, checkers, Othello, and cards fall in) derived for the computer—possibly one of the best derived at all. But *Pensate* couldn't exist without the computer; the capabilities of the computer are essential to it.

Pensate is played on a grid of sixty-four squares. The idea is for the player to move a token from the bottom row of the grid to the top in vertical or horizontal steps. The computer begins with four randomly placed pieces and increases its army by one each time the player wins a round; its purpose is to thwart the player's attempts, either by landing on the player or by causing the player to land on one of its pieces. This purpose is built in; the computer player is not intelligent. It acts in absolute, predictable patterns—but just try to anticipate all of them.

Anticipating the computer's moves is what it's all about. The computer's pieces may consist of any selection drawn from among ten varieties of pieces. The simplest are designated by single-direction arrows, which always move in the direction they point and always just one square—uh, unless that square is occupied by another piece, in which case they go to the next square, unless that square is occupied, in which...and so on. The other six pieces move in set patterns, but their direction depends on the previous move of the human player. For instance, horseheads move like knights in chess; right-facing horseheads move two squares east and one square south if you move north, two squares south and one square west if you move east, two squares west and one square north if you move south, and two squares north and one square east if you move west. And if the appropriate square is occupied, they move again. Since all computer moves wrap around, anticipating where three or four right- and left-facing horseheads will end up in two, three, or four moves can be a considerable challenge. The moves of all pieces between the arrows and the horseheads depend somewhat on your move, although these pieces move only in simple one-steps.

Why on earth, say, would you bother to anticipate where a piece would be two, three, or (ridiculous) four moves hence? Well, besides the fact that you have the best chance of winning if you can get a good grip on the safe path to the top before you take your first move, *Pensate* challenges you to play in modes that require you to input two, three, or four moves at a time. Then you watch as your lonely warrior pursues the path you've set for him in the midst of a dozen or so computer pieces going in every conceivable direction. All you need to overlook to be quite dead is that one piece is going to land in front of another piece that will therefore gain an extra square.

Since there's no way of knowing before you take your first move the order in which the computer pieces will move (they move in a random sequence that holds throughout one game), it's nearly impossible to safely anticipate four moves in advance at high levels. Playing two moves in advance at high levels is a solid challenge, but one that's meetable and fun. Learning or competitive play (with other humans) is enhanced by the option to replay any setup. You can also save and replay any game, if you write down the rather clumsy ID number. A separate practice mode puts the computer's pieces at your disposal to be arranged on a blank grid and played as you like.

Within tournament (normal) mode, you can choose from among nine levels of difficulty (your choice determines the percentage of more difficult computer pieces you'll get and at what game levels) and from six speeds—there's a slow speed for beginners, so you can learn how the computer player works.

There are two other options. One increases the difficulty of any level geometrically, the other could almost be called a second unique game.

You enter the first of these modes by selecting the innocent word *retrace* from the Skill menu. Choose your other options any way you like. But every square you leave becomes off-limits—indicated by a stop sign—so you can never backtrack or cross your own path. Retrace also prohibits one of the most useful tricks of the regular game. Human players' tokens don't wrap around; inputting a move in the direction of an edge to which you are adjacent makes all the computer pieces move as they would if you were really moving in that direction, but you remain in the same place. In retrace, however, you lose if you occupy a square twice.

The second of these options is two-player mode. The second player (human, one assumes) begins at the top of the grid and tries to reach the bottom. The two players

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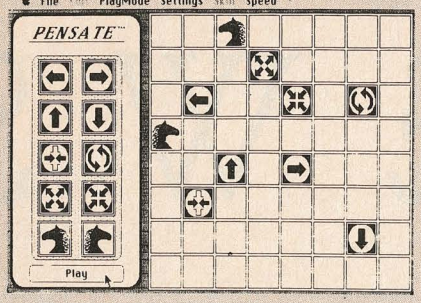

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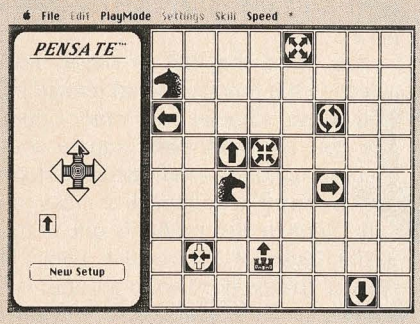

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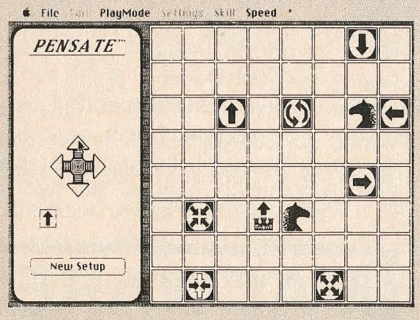

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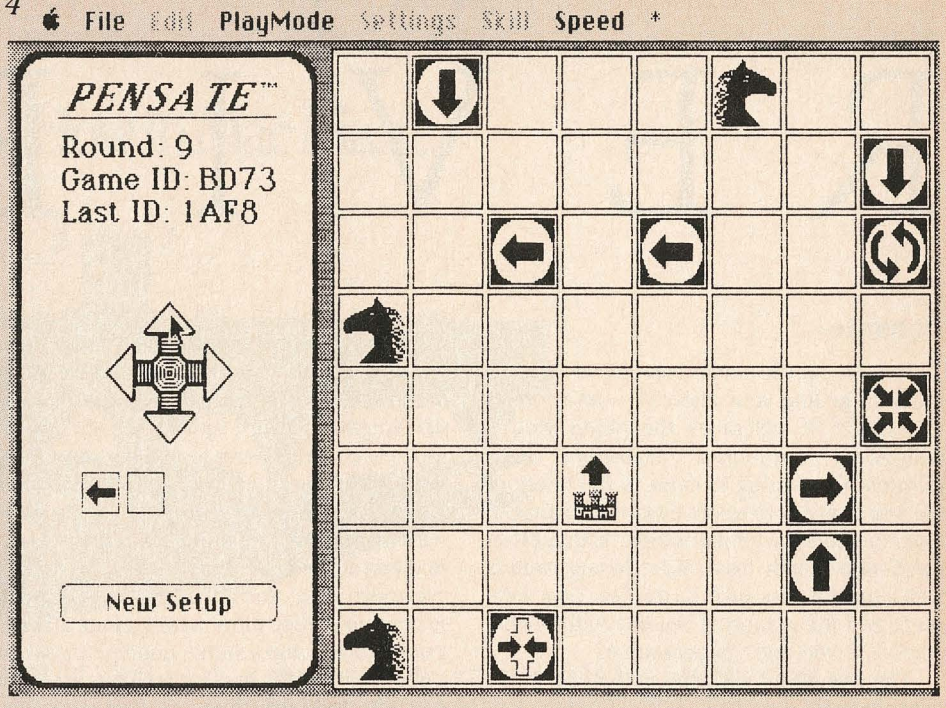

1. In practice mode, the player can choose the computer's pieces from the menu on the left-hand side of the screen and place them anywhere on the playing board. This board is set up with one each of the ten kinds of computer playing pieces. The computer's moves relative to the human player's moves are shown by the sequence in the next screen. **2.** The player's piece (the castle) has been placed on the fourth space on the bottom row and moved up one square. Each of the four straight-arrow pieces moved one square in its designated direction. The other pieces moved in ways determined by their programming and the player's move. **3.** This is the result of another move up the screen by the player. Note that moving one square at a time is allowed only in practice mode. **4.** In tournament mode, the player has to enter at least two moves in advance and may choose to move three or four turns ahead to make the game more challenging. As each round of tournament play is successfully completed, another computer playing piece is added to the fray, a new setup is generated, and the player starts again on the bottom row.

may choose to compete with each other or—more likely, and an incredible challenge in itself—to team up against the computer.

Consider what you must keep in mind if you and a friend are playing just two moves in advance at game level 6, where the computer has nine pieces. It's your turn to input two moves. Assuming you're the bottom player, you move first. You must choose this first move

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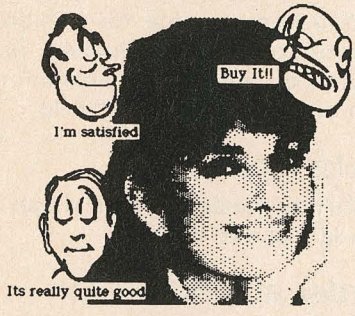

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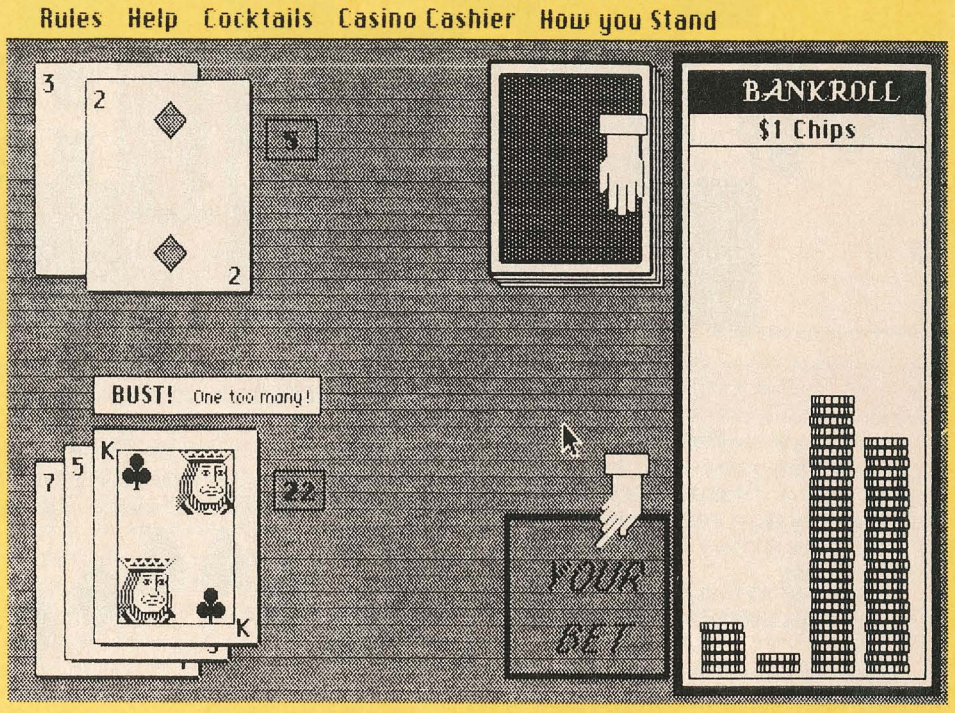
while keeping in mind that, while you're in the square you've moved to, each of the computer's pieces will move, then your friend will move, and then each of the computer's pieces will move again, in accordance with the move your friend made. If you've survived, it's your turn again—except that, since you're playing two moves in advance, you have to determine your next move without knowing for sure whether you'll survive the first; and you must anticipate the whole round of computer and friend moves according to how you made your second move (and how your friend made hers). It's a heck of a good game.

Pensate is superior, as absorbing as a good book, as addicting as an arcade, and even more challenging than Trivial Pursuit. Its adaptation to the Mac is excellent, its graphics and animation smooth, its use of the mouse sensible. But *Pensate* isn't a seasonal sport; it's a game for all seasons, in infinite variety, for as long as you have your Mac.—Margot Comstock Tommervik

Pensate, by John Besnard, Mac version by Robert Hardy. Penguin Software, Box 311, Geneva, IL 60134; (312) 232-1984. $39.95.



Mac-Jack

Gambling games, properly done, are good "investments," since they never wear out their welcome. A game of chance offers enough of the elements of luck and skill to entertain a wide range of people; besides, how can anyone really be a loser when it's so easy to get a fresh start?

Blackjack games, in varying degrees of sophistication, show up sooner or later (usually sooner) for just about any computer system and are a pleasant addition to any software library. *Mac-Jack* is no exception. A fifty-two-card deck is dealt by a dealer who has nothing up his (or her) sleeve. The title screen asks for a name for a "credit application" and welcomes previous players back. (The top ten scores, which are stored on disk, appear on the title page as well.) Once the player's at the "table," the following menu bar choices become available—Rules, Help, Cocktails, Casino Cashier, and How You Stand.

"Rules" refers to the house game rules regarding such serious matters as payoffs, splits, and the fact that the house reserves the right to throw drunks out of the casino. This program does have a sense of humor, which allows it to make editorial comments about your gaming skill (or lack thereof). "Help" provides information you need to play the game. It tells you, for example, that using the mouse to drag your chips from the bankroll area to the betting square initiates play. As in *Mac-Slots* (an earlier program by the same author), "Cocktails" refers to the highest bet possible at a given time; the limit starts at $125 and increases as a given session continues. The "Casino Cashier" is where loans are made or repaid; it's also where you exchange chips for different denominations ($1, $5, or $25). "How You Stand" provides financial standings for the current session and information about your overall winnings (you hope!).

Graphics are as good as you might expect, and such touches as seeing the cards shuffled and slid across the table help make this a pleasing program. There are a couple of drawbacks—the inability to have more than one player or deck of cards at a time and the fact that you can't revise the rules—but they don't detract from the game's playability. All in all, this is a very adequate implementation of an old favorite.—Steve Shendelman

Mac-Jack. DataPak Software, 14755 Ventura Boulevard, Suite 1-774, Sherman Oaks, CA 91403; (818) 905-6419. $39.95.

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MISCELLANEA

Once upon a in a not far from here lived a named the s. One day the said, "I need . I think we spend too much time in front of the . Let's move to a in the country where there will be lots of and instead.

So one day the family got their and boarded a for their new in the .

The was happy because she could have a garden with and and . The was happy because he could go and he could sleep without noisy .

The were happy because at last they could have a and could play in the .

One day the saw a and started to chase it. After a time he came to a where there were and other interesting animals he had never seen before like .

The noticed that the had been gone a long and went to find it. They everywhere. Suddenly one of the saw some but they did not belong to the . They were very big. "They belong to a ," said the . They are certainly not the tracks of a or a .

So the followed the all around the and up into the . Suddenly...

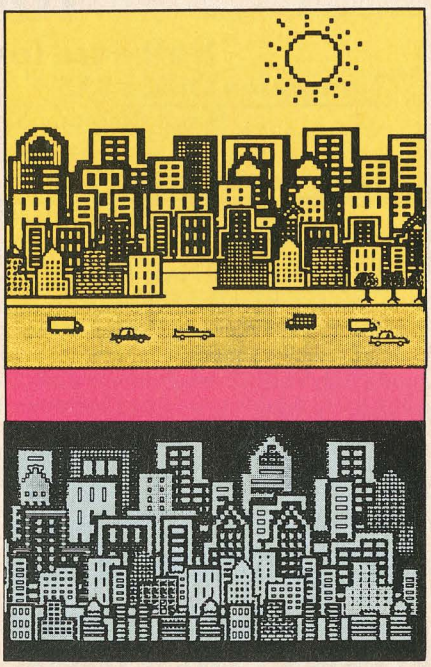
Cairoglyphics

As almost everyone knows by now, Apple's new Cairo font is a set of pictures that can be used freely within your text without requiring the cumbersome process of moving *MacPaint* graphics to and from the Scrapbook. Cairo pictures can be moved and displayed just like characters from any other font in *MacWrite* or *MacPaint*.

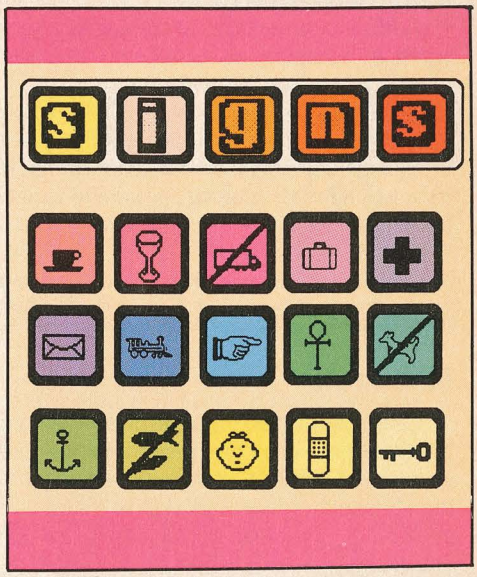
"Cairoglyphics" opens up a world of creative possibilities even to those who believe they have no drawing ability. Now, with just the press of a key, a letter can be punctuated with flowers, fruit, or whatever the occasion requires. Like characters in other fonts, Cairo pictures can be plain, bold, outline, italic, shadow, or a combination of styles.

One of the more practical uses for Cairo is to create borders. In addition to the rows of buildings, several other characters have been designed to make good borders. Some are traditional, like the knots; others, like the footprints, are more whimsical. Imaginative borders can be created using the new superscript and subscript, such as the trees shown here.

In *MacPaint* you can use the lasso and selection rectangle to enlarge, repeat, distort, and invert Cairo images. In fact, practicing with the Cairo pictures is an easy way to get familiar with the variety of techniques available in *MacPaint*. It's important to recognize the limitations of these pictures, however, due to their size. Images that are largely composed of verticals and horizontals (like the buildings) can be enlarged with fair success. But other objects become distorted when they're enlarged to more than twice their original size.



The cityscape was created by typing one line of buildings at a time, starting with seventy-two-point type and making each successive line in a slightly smaller size. Buildings were varied by making some bold, others shadow, and so on. The overlap of buildings was created using the lasso to move each row into place. The trees, cars, and trucks were added next. The convertible is the only Cairo image accessed using the Option key (lower-case *a*). Patterns were added to create more variety among the buildings and the vehicles.

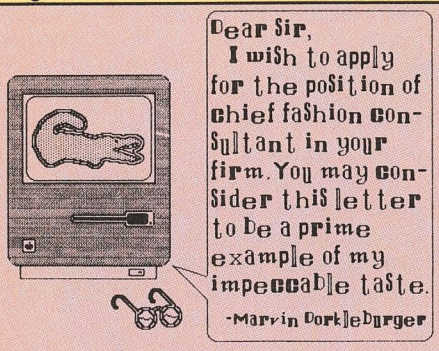


The cityscape by night was created in the same way, except that the paint bucket was used to turn the outline of the buildings into a dotted pattern, as if reflecting light, and a black background was added.

The signs were easy to make using the shapes and straight line from the *MacPaint* tools palette. The children's story is another reminder of how much information can be conveyed in pictures.

In time, it's likely that additional picture fonts will be available from other commercial developers—an entire font for a particular type of business, for example. (How handy it would be to have a font of all the design symbols of electrical wiring, or choreography, or real estate.) It's likely, too, that an applications package will be developed enabling home users to design fonts of favorite characters for their own particular needs.—Neale McGoldrick

Real Macintoshes Don't Wear Alligator Shoes



If your name is Marvin Dorkleburger, then you're going to need all the help you can get. Don't make matters worse by creating business letters in the San Francisco font!

-M.A.

Let's face it. Macintosh is revolutionary. Who would have thought that a personal computer could turn a computerphobic klutz into a Picasso, a da Vinci, or even a Gutenberg (for those of you who have forgotten your fifteenth-century European history, Johann Gutenberg was the inventor of the printing press). Macintosh offers a freedom of style never before known to personal computer users.

However, while both the artist and the inventor have complete freedom of style, the printer does not. He must present his text in a style considered acceptable by those who will be reading it. You, as a Macintosh user, are obliged to do the same.

Unfortunately, many Macintosh users will not be able to handle the tremendous versatility thrust upon them by their new "printing presses." Because of the abundant supply of possible font/style combinations that can be accessed through Macintosh word processors, many users will be tempted to exhaust these possibilities during a single session. The document resulting from such temptation will not be a highly attractive one. In fact, it will be downright MacTacky.

Do you remember that kid in your high school chemistry class who prepared his multichaptered term paper on a state-of-the-art typewriter, making use of every feature the typewriter had to offer? And do you remember how the teacher raved over the paper and its author in front of the entire class? Can you recall that student's name? I bet it was something like Marvin Dorkleburger. Right?

Well, folks, here's an update on our friend Marvin. Marvin is the general manager of a small factory outlet somewhere in Kansas. He wears alligator shoes, plaid pants, and polyester jackets. And he prepares inventory reports for his boss using the eighteen-point bold italic outline San Francisco font. MacNauseating!

Obviously, a line must be drawn between emphasis and gaudiness. Creating an inventory report with the San Francisco font is every bit as bad as wearing a bikini to the senior prom. It's just not acceptable. Therefore, what follows is a brief review of some basic style (yech!) rules, as well as some possible uses for a few of the fonts available to the Macintosh user. If you don't like these suggestions, you're probably related to Marvin.

"Know Thy Style"

Because of the limitations placed on us by the typewriter, many of us have resorted to alternative methods of emphasizing our thoughts. However, with the style options offered to us by Macintosh, we can return to those stylistic rules that were carved in granite so many years ago. Here are a few of those "style commandments."

First of all, italic should be used when referring to names of ships, books, or magazines. It should also be used when citing foreign vocabulary or (optionally) slang. Next, boldface should be utilized to reinforce a word or phrase. Finally, underlining can be used to create signature lines and the like.

The remaining style options aren't used as much but do make life a bit easier. Superscripts are used in footnoting and in mathematical expressions. Subscripts are used in many of the physical sciences. The outline and shadow options can be used to make headlines, titles, and breakers. However, the above styles should not be used within a block of text, as they will distort the space between lines and give your paper an unkempt appearance.

But however you use these techniques, be consistent in your handling of them. While failure to do so won't result in the same poor communication that sank the *Titanic*, it won't do wonders for your reputation as an immaculate text preparer either.

Furthermore, remember to limit your use of these techniques to the places in which they are absolutely necessary. Your reader will only be able to handle a certain amount of emphasis. As the number of emphasized words increases, the overall impact becomes diluted. In other words, less is more.

Parting the Font Sea

Just as the individual clubs in a golfer's bag have different purposes, so do the individual fonts available to the Macintosh user. Furthermore, just as the golfer will resort to his putter for about half of his strokes, the Macintosh user should resort to a single font throughout the majority of his text.

As far as a font for the main body of the text goes, the best choice is New York, Geneva, or Toronto. These fonts all boast attractive characters that are neither too light nor too dark. Furthermore, slight variations in some of the characters give each font a flavor all its own. For example, if you are partial to a serif style, you can choose between New York and Toronto. New York, which happens to be the darkest of the trio, offers a more stylish *g* and *a*, while Toronto offers the only round-tailed *y*. Both Geneva and Toronto offer very clear numerals.

The only other font that could possibly be used for the main body of the text is Monaco; however, some of the characters in this font are poorly designed and have a sloppy appearance in the smaller points.

The remaining fonts are well suited to other uses. Chicago is naturally bold and therefore could be used to label graphs and diagrams. Athens is also very bold and looks sharp when displayed in the larger points, thus making it ideal for titles. Both Venice and London boast a romantic flourish and could be used to design catchy invitations and headlines. The more casual style of Los Angeles is ideal for informal invitations, memos, and messages.

San Francisco has no apparent use, except maybe for the creation of ransom notes.

Taking a Bite of the Forbidden Font

In conclusion, let common sense be your guide. There is no need to impress your reader with an unnecessarily gaudy document. Instead, let your reader be impressed by the fact that she is reading something that was created on a personal computer—specifically, a Macintosh. After all, a brilliant idea deserves better than the San Francisco font.

And Marvin, if you're out there, get a new pair of shoes. People stopped wearing alligators on their feet long ago. Now they wear them on their chests.—Mitch Altschuler

MAUG Program Exchange

An active user group on CompuServe called MAUG (Micronet Apple User Group) has two sections dedicated to the Macintosh. More than a hundred MS-Basic, MacForth, *MacPaint*, and *MacWrite* files are available for download. Some of the most notable programs are *MacTEP* (a terminal emulation program in MS-Basic), MacForth Backgammon, the game of go, Basic program utilities, 3-D animation of a globe, four-voice music, and printer utilities. Once you're on CompuServe, type GO PCS-51.

—Christopher Allen

Mac Goes Hollywood

Star quality—that *je ne sais quoi* that just has to be discovered. Garbo had it, Bogart had it, and Macintosh has it too, according to the American Intelliware Corporation. The company is developing *MACFATS* (the last part of the acronym stands for "Film-Advertising-Television-System"), a series of programs for the Macintosh to handle storyboards, production planning, contracts, scriptwriting, budget planning, and other film industry needs. The storyboard program was recently demonstrated at The Micro Show, a meeting of the Silicon and San Fernando Valley cultures. The program takes advantage of Macintosh's graphics to create on-screen scenes that contain images of people, ani-

mals, and backgrounds. According to the company, the program will feature thousands of pregenerated objects and settings, which can be edited by the user.

For more information on *MACFATS*, contact American Intelliware Corporation, 330 Washington Street, Suite 400, Marina Del Rey, CA 90292; (213) 827-0803.

Macintosh Newsletters

Iconcepts is a monthly newsletter that contains product reviews, user hints, prerelease product information, commentary, *MacPaint* submissions, letters, and an academic Macs section. A year's subscription costs $18. *Iconcepts* is published by Icon Concepts. For more information contact John Buquoi, Box 1936, 916 Bradley Drive, Athens, TX 78751; (214) 677-2793.

The Macintosh Support Group Newsletter is designed especially for developers, marketers, dealers, and distributors of Macintosh-related products. The newsletter is published twice monthly and covers computer industry news, new Macintosh products, summary articles from major publications, sales and marketing tips, and technical support material. Corporate membership in the Macintosh Support Group costs $195 a year and includes the newsletter. For more information contact John Zapata, Macintosh Support Group, Computer Resource Center, Box 461483, Garland, TX 75046; (214) 238-3114.

MS-Basic 1.01

A version 1.01 of Microsoft Basic is now available from Microsoft. To get the new version, you must contact the company and obtain a return authorization number, then mail them your master disk. The new version adds some features and fixes a number of bugs in version 1.00, including the following:

LPRINT no longer causes buffer overflow when the Imagewriter DIP switch is changed from DTR handshake to XON/XOFF.

Command-. now works like Command-C.

A sample dumb terminal program is included.

Under Lisa MacWorks, the CIRCLE statement works properly and the full screen is available to Basic.

A save no longer saves only part of the file if you go to the File menu before the disk write is complete.

A bug in the GET and PUT statements has been fixed.

Files keep their folder's identity when opened.—Christopher Allen

Apples in ComputerLand

In June we reported that Apple received two important validations of its marketing strategy when Sears Roebuck and Company's Business Systems Centers and Businessland decided to carry Macintosh and Lisa.

Now ComputerLand, the world's largest retailer of personal computers with 670 stores in twenty-five countries, has announced its decision to carry the Macintosh and Lisa 2 as well as the Apple IIc, IIe, and Apple III personal computers.

"In addition to providing our customers with dependable and knowledgeable service, ComputerLand franchises will provide us with a market presence in geographic areas not presently represented by Apple," said John Sculley, Apple's president and chief executive officer.

The decision went into effect August 1, but full-scale shipments of the Apple products won't begin until September, when Apple expects its computer shortage to end.

The Fiery History of Personal Computing

Fire in the Valley: The Making of the Personal Computer
By Paul Freiberger and Michael Swaine
Osborne/McGraw-Hill; 288 pages; $9.95 paperback

Fire in the Valley was written by two former employees of *InfoWorld* magazine. Paul Freiberger is the world's greatest computer "snoop" journalist, and Michael Swaine is, among other things, the inventor of the greatly missed Mr. Usasi, a cerebral detective always on the trail of mathematical puzzles.

Both guys live and breathe personal computers. Both are young, smart, sharp, smooth professional journalists. These days, Paul is the West Coast editor of *Popular Computing* and Mike is the editor of *Dr. Dobb's Journal*, a computer magazine that delves deeper into computers than most.

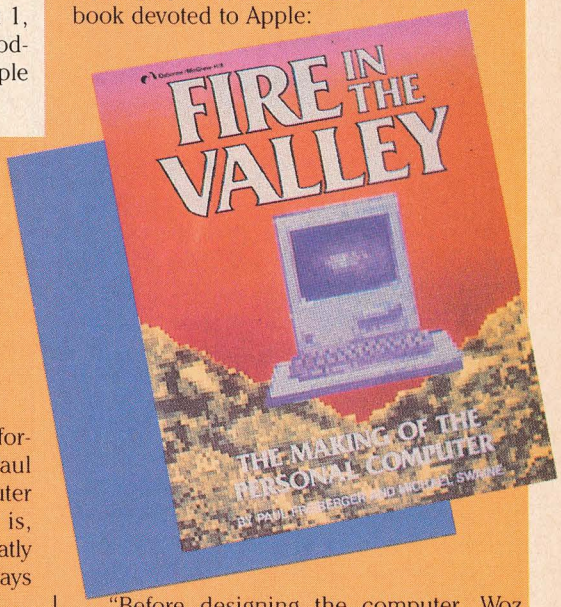
Together, they've given us something we haven't had before: a history of personal computers. Where they came from, who the main players were (and are), who won, and who lost. The inside stuff: despair, risks, stupid decisions, smart ones, overnight failures, and instant millionaires.

More than anything else, *Fire in the Valley* is a history of people giving fumbling, fitful birth to an industry. It's Gary Kildall, author of CP/M, getting taken to the financial cleaners by Seymour Rubenstein. It's John Draper, a.k.a. "Captain Crunch," discovering that a whistle in a cereal box called—you guessed it—allows him to make free long-distance calls, a discovery that spawned "blue boxes" and a hobby called "phone phreaking." A hobby that was later pursued by two guys named Jobs and Wozniak.

For all the anecdotes, for all the corporate intrigue and power plays, *Fire* is, above all, a history. A straight narrative written in straight journalistic style with lots of facts and lots of quotes. The book reads like a good hard-news story: clean, punchy, and accurate.

In *Fire*, for the first time, we get the definitive story about where personal computing came from. How Bill Gates and Paul Allen started Microsoft, how Ed Faber went from IBM to Memorex to IMSAI, then left to start something called ComputerLand. How the IBM PC rocked the industry, and how a computer named after "Star Trek" started it.

Apple followers, in particular, are in for a treat. *Fire* gives the complete story of Apple's beginnings, from the mythical "garage days" to the development of the Macintosh. Here's a paragraph from the lengthy section of the book devoted to Apple:



"Before designing the computer, Woz wrote his programming language. BASIC was the hit of the Homebrew Computer Club, and he knew he could impress his friends if he could get it working on his machine. 'I'm going to be the first one to have BASIC for the 6502,' he thought. 'I can whip it out in a few weeks and I'll zap the world with it.' He did exactly that, and when he finished, he set to work making a computer for it to run on. That was the easy part, he felt, since he had already built a computer. Woz designed a board with a processor (the 6502) and interfaces that connected it to a keyboard and a video monitor. Within a few weeks, he brought his computer to Homebrew and passed out photocopies of his design so that others could duplicate it. Like a perfect hobbyist, Woz believed in sharing information. The other hobbyists were indeed impressed. Some questioned his choice of processor, but no one argued with its $20 price. He called the machine an Apple."

Lots of people probably aren't interested in the IMSAI, the MITS Altair, the other early computers, or the early personal computer pioneers. But if you'd like to know where this industry came from—if you're puzzled by references to "Personal Software," "the Alto computer," "Intel," or even "Ithaca Audio"—then *Fire in the Valley* is worth a trip to your bookseller.—Doug Clapp

Microsoft played an integral role in the development of the Macintosh. It has a lot of our personality. Here are the first titles in the MacBook Library from Microsoft Press.

MacWork/MacPlay

Lon Poole

MacWork/MacPlay is a gallery of ideas for home and business on the personable Macintosh. Lon Poole, author of the popular *Apple II User's Guide* and "Get Info" columnist for *MacWorld*, brings you 24 original projects for using the Mac's most popular application software: MacWrite, MacPaint and Microsoft Multiplan. Practical...inventive...and loads of fun.

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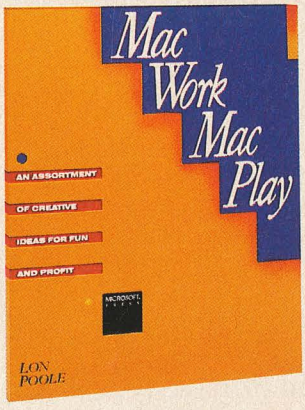

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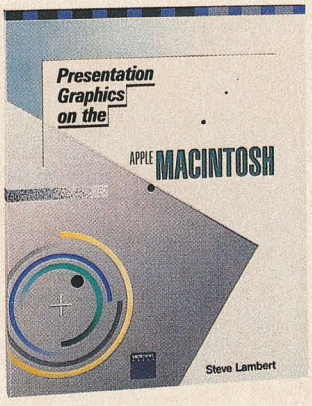

The Apple® Macintosh™ Book

Cary Lu

Cary Lu observed the creation of the Mac firsthand and takes you behind the scenes with this comprehensive guide to how the Mac and its software work. You see exactly what you get—all in the friendly, visual style of the Mac itself. A unique insider's view of this historic advance in computer technology.

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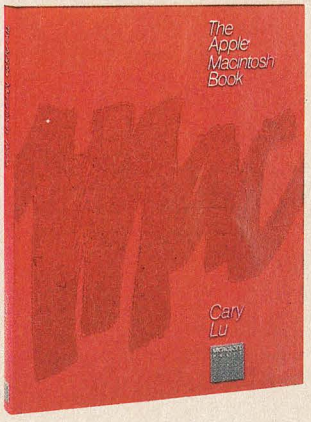

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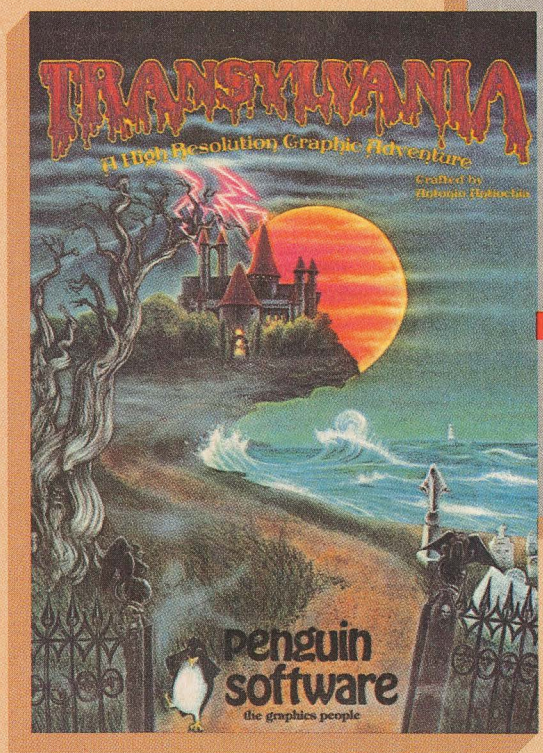

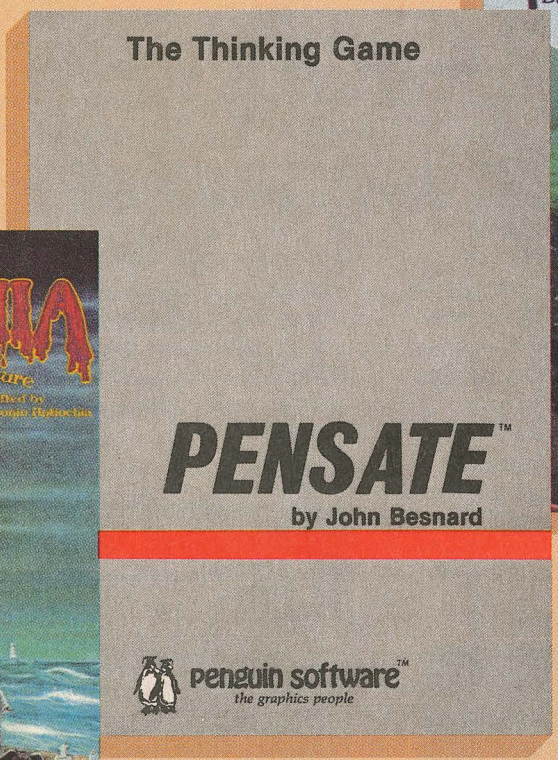

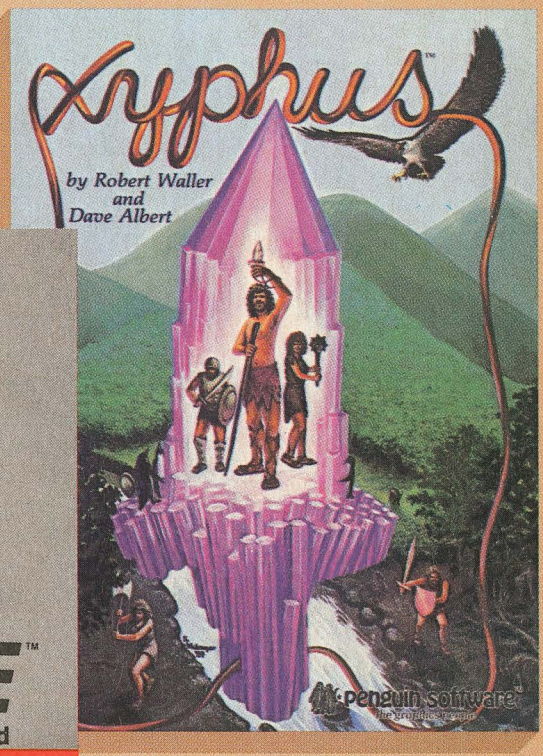

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